



Natural Disasters and Trade

Study I

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Executive summary



1. On 26 April 2018, World Trade Organization (WTO) Members approved research funded by the Permanent Mission of Australia to study the impact of natural disasters on trade. Section I of this report presents findings on the frequency, risk factors and trade effects of natural disasters. Section II examines the experience of six recently disaster-affected WTO Members across three different regions.
6. Of the 172 Trade Policy Reviews (TPRs) conducted during the period January 2010–September 2019, 54 refer to a natural disaster event – some 31%. The most commonly cited natural hazard is drought (referenced in 31 TPRs), severe storms (e.g. cyclones, hurricanes, typhoons) (9), flooding (7), and volcanoes (4), and earthquakes (3).

Section I: Frequency, risk factors and trade effects of natural disasters

2. There is a growing awareness of the risk of economic and trade disruption caused by natural hazards. The World Economic Forum's Global Risks Report 2018 ranks "extreme weather events" and "natural disasters" as the number one and number two risks most likely to occur in the next ten years by a multi-stakeholder panel. Worldwide, some 11,178 geophysical and hydro-meteorological disasters were recorded in the period 1980–2018 (EM-DAT 2019).
3. The number of natural disasters, especially hydro-meteorological disasters, recorded has been on the rise in recent years. Over the period 1998–2017, disaster-hit countries reported total direct economic losses valued at USD 2.9 trillion, of which hydro-meteorological disasters caused 77% of the damage. Direct and indirect economic damage has grown from USD 70 billion per year on average in the 1990s to USD 113 billion per year since 2000 (IMF, 2017). Economic losses from weather- and climate-related disasters have increased, but with large spatial and interannual variability (IPCC 2012).
4. Looking at disaster loss statistics over the period 1998–2017, the United States recorded the biggest losses (USD 945 billion), reflecting high asset values as well as frequent events. China, Japan, the European Union and India recorded the next largest economic loss figures. When expressed relative to national population or GDP, the impacts of disasters on smaller economies give high values. Hurricane Maria was the single most costly event relative to GDP in recent times, with damage reaching 225% of Dominica's GDP – a disaster that hit the Island less than two years after Tropical Storm Erika had inflicted damage estimated at 90% of GDP.
5. For small states with less than 1.5 million populations, the average economic cost per year for the period of 1950 – 2014 has been calculated at equivalent to nearly 13% of GDP, while for larger states the cost is less than 1% of GDP. The Caribbean emerges as particularly affected, with annual losses equivalent to 2.4% of GDP. Haiti is estimated to have incurred annualized natural disaster damage of 17.5% of GDP during the period 1998–2017. Some 1,273 natural disaster events in Least Developed Countries were recorded over the period 1998–2017 (17.5% of disaster reported world-wide), with total damage estimated at USD 40.6 billion.
7. Figures for the impact of natural disasters are conservative estimates, as data on the economic impact of disasters are sparse, especially for smaller-scale disasters. In low and middle-income countries, accumulated losses from small-scale and localized disaster events approach the same magnitude of those from major disasters.
8. The likelihood that natural disasters will follow past trends cannot be assumed. Natural hazard is dynamic. A factor exerting an influence on the incidence of hydro-meteorological hazards is climate change, both anthropogenic and natural climate variability. Neither is exposure static. Rapid urbanization, especially the accumulation of assets in seismic areas, is increasing exposure to natural hazards – and giving opportunities to reduce risk. The literature points to some disaster risk hotspots where hazard, exposure and vulnerability converge.
9. Natural disasters and trade interact in complex, and often unexpected ways, as well as in different dimensions, including at a macro or economy-wide level in disaster-affected countries, and at a sectoral, product or firm level. One important function that trade performs is that of a "shock absorber" for natural disasters. Put simply, trade allows the supply shortage in one location to be covered by imports from other unaffected places.
10. Imports play a critical role in recovery and reconstruction. As a general rule, the more severe the damage inflicted by a natural disaster, the broader the range of different goods and services that may need to be imported. Insurance and international reinsurance markets can help absorb losses and shift the burden of disaster response and recovery from the government budget to the private sector. Income remitted by nationals working abroad can also act as an important fiscal buffer for businesses and households. Various other imported goods and services can support recovery and resilience.
11. From the macroeconomic perspective, a natural disaster generates economic destruction and delivers a shock to the aggregate supply curve, resulting in a decline in real output and employment. While most disaster impacts on economic activity appear to be short-lived, in some cases the effects may persist for a long time. There is also evidence that poor countries can experience prolonged, slow, and incomplete recovery in the aftermath of severe disasters. Nevertheless, the



evidence of both short-term economic output contraction and medium to long-term difficulties is growing more robust, particularly in situations where the fiscal space is unavailable to engage in fiscal stimulus or funds are insufficient to achieve reconstruction. The deleterious effect of recurrent natural disasters on the same economy is also growing.

12. Countries experiencing a natural disaster can see a sharp deterioration in the trade balance. Import bills rise for food, raw materials and reconstruction materials, while exports tend to decline. Public debt rises, as imports put pressure on the current account and taxes revenue falls. Sluggish export recovery can constrain recovery and add further pressure to the financing gap when disaster losses exceed the fiscal capabilities of a disaster-affected government. In turn, vulnerability to recurrent disasters affects medium-term growth potential.
13. One factor masking the impact of natural disasters is that many disaster-affected states continue to register positive economic growth, either in the year of a disaster or subsequent years. A 2017 World Bank report highlights how a flood or earthquake can be disastrous for the poor but have a negligible impact on a country's aggregate wealth or production. The report estimates that extreme weather events push some 26 million people into poverty every year.
14. Another factor diverting attention and complicating the measurement of natural disaster effects is that other crises or challenges may impinge on the disaster-affected state. Conflict, migration and economic shocks often intertwine with natural disasters, as demonstrated in the Trade Policy Review examined for this report. Paraguay is a case in point. The drought conditions of 2011-2012 caused a contraction in economic output of equivalent size to that of the global economic crisis just two years before.
15. Economic research also suggests that natural disasters can exert more severe impacts on specific groups of the society: poor and marginalized people are far more affected by the same economic loss, the life expectancy of women are more negatively affected by natural disasters than that of men, and Micro- Small and Medium Sized Enterprises (MSMEs) bear more burden from natural disasters. The loss of business documents, including electronically stored documents, and delays in restoring essential services such as electricity can further lengthen interruptions to normal commercial operations.
16. Floods and drought emerge as exerting an impact on trade for countries with a high concentration of agricultural exports in their foreign trade. The TPRs of Burkina Faso, Kenya, Namibia, Niger, Senegal all highlight this effect. Measures taken to support recovery in the agriculture sector in the event of a natural disaster were reported in the TPRs of more than 20 Members. Several Members also reported actions in support of public stockholding for food security, including the establishment of such schemes in the wake of a natural disaster. Provisions for the enactment of price controls for agriculture products were reported, as were export restrictions. Various measures were also taken to address the threat or impact of natural disasters on the fisheries sector.
17. Natural disasters can also severely affect trade in a wide array of services sectors. Damage and losses to the electricity sector, for example, can have a ripple effect through the economy. How quickly power can be restored will affect the recovery of other sectors, including the communications sector. The TPRs of Kenya, Brazil and Costa Rica reported inflation in electricity prices and drops in hydroelectric power output due to the higher operating costs associated with frequent droughts.
18. One sector that may suffer direct physical damage from natural disasters is the travel and tourism sector. A less direct mechanism through which the tourism sector may be impacted is consumer perception which may be informed by perceived, rather than actual risk. Tourism earnings often declined after disasters.
19. Fiscal space, institutional capacity, and ex-ante preparedness can help mitigate the cost of natural disasters. However, it may not be available to governments of small, poor countries who lack the "fiscal space" to carry out stimulus policies. A further complication for many disaster-affected Members is that a fall in output is likely to reduce revenue from taxes and duties. Amongst the reasons reported for output declines in the research are damages to export-oriented firms and trade-related infrastructure, such as ports, airports, roads, and customs.
20. One way in which the economic shock of a natural disaster may be transmitted is through supply chain effects. A nascent economic literature points to evidence that supply chains propagate idiosyncratic shocks at least in the short run following a natural disaster. The extent to which natural disaster shocks are amplified in a supply chain network depends on the level of input specificity (i.e. whether companies can find substitutable inputs from alternative sources). The impact of a natural disaster event in one Member affecting another is referenced in five TPRs. One less known example is Uganda's 2012 TPR that references problems in coffee exports as a result of air transport disruption following the 2010 eruption of the Eyjafjallajökull volcano in Iceland.
21. At the same time, some empirical evidence indicate that supply chain networks enable firms to more easily find substitutes for damaged suppliers. Firms can benefit from diversified networks with suppliers and clients because they can substitute the surviving firms in the network for the damaged



partners and receive support from them. In addition, trust, quality information-sharing and public-private partnership are critical enablers of resilience in supply chains.

22. Strengthening resilience of supply chains is a topic that has elicited a great deal of interest in the last decade, both in the private and the public sectors. The main recommendations from these studies are enhanced multi-sectoral cooperation, better information sharing, development and adoption of international standards on resilience and greater use of risk assessment tools. The disaster reduction community recognizes that “there is no such thing as a natural disaster, only natural hazards.”
23. The Sendai Framework for 2015-2030 aims to achieve “the substantial reduction of disaster risk and losses” through disaster risk reduction (DRM) measures. A range of DRM measures to promote resilience are reported in Members’ TPRs. Maintaining financial reserves sufficient to cover nine months imports was one of the measures reported. Risk management plan to mitigate the risk of droughts and the use of agricultural weather-index insurance product are two examples. Mandatory legal requirements for buildings insurance and infrastructure investment to protect against natural hazards are reported. Drought resistance crops, food security laws and, disaster insurance products for farmers are among the measures cited.
24. In conclusion, the evidence reviewed in this research, suggests that an open, rules-based trading system can support resilience in the face of natural disasters. Some economic evidence suggests that countries with an open and competitive market are better prepared for a disaster, better able to respond when it strikes, and able to recover more quickly in the aftermath.

Section II: experience of six recently disaster-affected WTO Members

25. Dominica, Fiji, Nepal, Saint Lucia, Tonga and Vanuatu face a range of hydro-meteorological hazards (e.g. drought, flooding, landslides and storms, including cyclones and hurricanes) and geo-physical risks (e.g. earthquakes, tsunami and volcanoes). To varying degrees, these events have curtailed economic growth, depressed exports and fuelled import growth, exerting pressure on the current account and debt levels. Climate change is predicted to make hydro-meteorological hazards more frequent and severe. Natural disasters have pushed back the graduation from Least Developed Country status of both Vanuatu and Nepal.
26. On an annualized basis, losses as a percentage of GDP due to natural disasters are estimated in a range of 3.4% for Saint Lucia and up to 6.6% in Vanuatu. In any given year, it is likely that the five island states surveyed (Dominica, Fiji, Saint

Lucia, Tonga and Vanuatu) will be either hit by, or recovering from, a major natural disaster, most commonly hydro-meteorological in origin. Nepal must also contend with seasonal rains and flooding. Prior to the 2015 earthquake, flooding accounted for 53.2% of combined economic losses in Nepal from natural disasters over the period 1990-2014.

27. The recovery time between storm events can be short. Successive storms hit Dominica only two years apart (Tropical Storm Erika in 2015 and Hurricane Maria in 2017) causing damage estimated at 90% and 226% of GDP respectively. Since 1990, Vanuatu has experienced at least 20 damaging tropical cyclones. Seismic hazard is also an ever-present risk among most of the surveyed Members. Risk arises not only from direct damage caused by the earthquakes themselves, but also secondary hazards such as landslides and tsunamis. Earthquakes tend to have graver consequences for life in Nepal than more frequent disasters such as floods, landslides and droughts.
28. “Mega events” tend to mask the burden of smaller, localized events. Droughts, flooding and minor earthquakes are examples of frequently under-reported events that cumulatively may have deleterious impacts on economic growth and trade in specific localities or regions. For example, Volcanic eruptions also necessitated the evacuation of Vanuatu’s Ambae island in the same year. The economic impact of natural disasters can be costly even when the Member concerned is not itself directly impacted. Saint Lucia was spared direct damage during the 2017 hurricane season, but still faced trade disruption and higher costs that affected its economic performance due to weather-related disruption of regional air and maritime shipping, rerouting of consignments and delays resulting in lost business and reduced profit margins.
29. Natural disasters may also coalesce with other “man-made” factors to magnify their economic impact. In Nepal, the economic losses and dislocation from the 2015 earthquakes were exacerbated by the disruption to essential supplies on Nepal’s southern border. The cumulative impact of these two events was a contraction in economic growth from a projected 4.6% down to just 0.4% in 2015. Nepal’s experience underlines a broader point on the importance of transit for disaster resilience in landlocked countries.
30. Tropical cyclones (TC) and hurricanes also exert downward pressure on economic growth. TC Gita knocked three percentage points off Tonga’s GDP growth in 2018. Fiji’s growth dropped 2.5% after TC Winston, and Vanuatu’s economic growth contracted 2.8% percentage points after TC Pam. With trade to GDP ratios above 50% for all six surveyed economies (and closer to 100% in the case of some of the island economies), weather-induced falls in economic activity rapidly translate into slow-downs in trade flows.



31. Reconstruction activity can be an important economic stimulus in the aftermath of disasters, but also debt-creating in the absence of sufficient external aid or dedicated domestic reserves set aside to cover such eventualities. In Dominica, fiscal adjustment and restructuring had driven public debt down from a high of 100% of GDP in mid-2000s to around 63% in 2009. Reconstruction activity in the wake of tropical storm Erika and Hurricane Maria risks placing upward pressure on public debt and creating a significant risk of debt distress in the IMF's view. In Vanuatu, the stock of public debt to GDP increased by 20 percentage points after Cyclone Pam.
32. IMF research highlights that reconstruction and recovery efforts after disasters reduce resources for productive investment, further tighten limited government budgets, and create higher debt risk. Furthermore, projections on future debt sustainability worsen if exposure to future natural disasters is included. Without transfers of Official Development Assistance (ODA), external debt would be significantly higher among some of the surveyed countries.
33. For several of the disaster-affected countries surveyed, remittances act as a fiscal buffer. Remittances account for some 26% of GDP in both Nepal and Tonga. Income remitted by Nepalis living abroad jumped 14.3% in 2015 (the year of the earthquakes) to reach USD 6.7 billion. Temporary labour mobility (i.e. services mode 4) schemes play an important role in this regard.
34. A range of trade facilitation issues emerged during the disaster response phase in the country research. Some of the issues can be attributed to the scale of the damage faced by relevant national authorities. Another difficulty was that import systems even in normal times were not set up for the sudden surge in volumes of relief imports that arrived in the immediate disaster response phase. Container traffic into the damaged port of Roseau, Dominica jumped from an average of 80 containers per week to a peak of 300 containers in the aftermath of Hurricane Maria. Airport congestion due to landing load and plane size restrictions were a complicating factor limiting response at Tribhuvan International Airport in Nepal. Issues relating to airport runway management also arose in Port Villa, albeit after the passage of Cyclone Pam.
35. Private sector representatives strongly underlined the criticality of port functions to business continuity. A series of customs and border issues were distilled from the country research. These included:
 - Delays in triggering emergency legislation;
 - Uncertainty about the exemption of relief organizations and relief goods from customs and other duties and charges;
 - Doubt as to the scope and duration of exemptions;
 - Difficulties in distinguishing between relief and commercial goods;
 - Restrictive customs policies requiring payment in full prior to release from customs control;
 - Unfamiliarity with, and difficulties in, accessing relevant official documentation relating to customs and other border clearance formalities;
 - Concern at relief actors working outside official channels and coordination mechanisms;
 - Delays in securing visas and recognizing professional qualifications of relief personnel;
 - Quarantine restrictions on the import of search and rescue animals;
 - Cumbersome import license requirements, including for telecommunications equipment;
 - Problems in securing temporary admission of relief equipment, at both entry and exit;
 - Control, inspection and release procedures ill-adapted to emergency situations;
 - Concerns on the part of plant and animal quarantine officials about the entry, establishment and spread of pests with relief consignments;
 - Pressure on governmental revenue from prolonged, extensive duty exemptions; and
 - Problems with the storage and disposal of unsolicited bilateral donations.
36. How lists of relief items are established, the charges that are exempted, the duration of exemptions and quantitative restrictions on waivers for some import items were issues raised by private sector actors during national consultations in one region. Distinctions were also drawn between the needs of relief organizations and households on the one hand and commercial operators on the other hand. A concern expressed by many stakeholders was that commercial actors were given lesser priority even though they were essential to economic recovery.
37. A surge in imports, static or declining exports and pressure on the current account are common trends that emerge from the trade performance of the six disaster-affected countries surveyed. Furthermore, disaster events tend to accentuate underlying structural trends. Sluggish exports have been outpaced by imports as the merchandise trade balance widens. In some cases, the deterioration in the trade balance precedes a natural disaster.

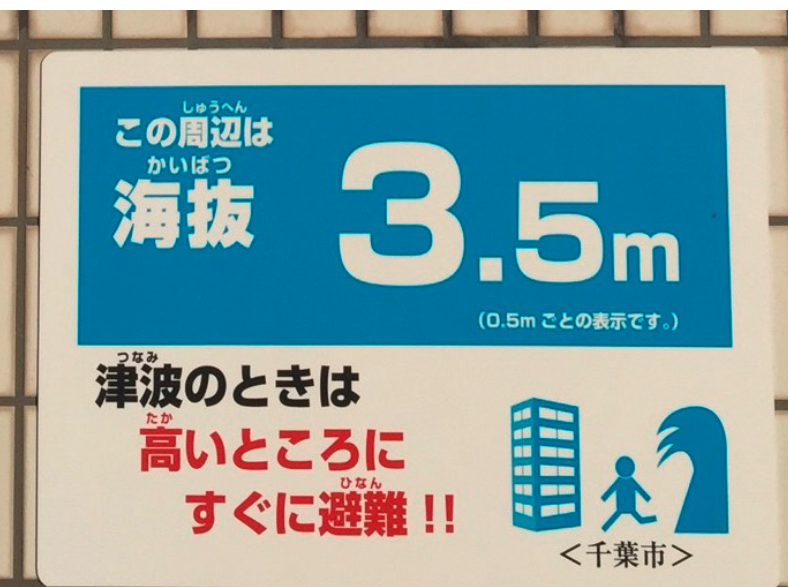


- Cyclone Pam appears to have accentuated an established underlying trend in Vanuatu.
38. One factor to highlight is higher infrastructure investment spending, which has been a factor driving import growth, financed largely through concessional lending and donor support. Activity in the construction sector associated with infrastructure upgrading and post-disaster reconstruction acts as an important economic stimulus. It can also lead to sharp increases in the import of construction materials. In Nepal, buildings sustained about 50% of the losses and damage caused by the 2015 earthquakes. Due to the limited availability and/or quality of local materials, a significant proportion of building materials are imported into Nepal, including an estimated 80% of all cement, as well as glass, aluminium, plaster, fixtures and fittings.
 39. Natural disasters can also put additional pressure on an already struggling manufacturing sector. Damage to premises, stocks and machinery, together with labour shortages all disrupted operations in the Members surveyed. Sustained power outages, restricted access to credit and slow pay-outs of insurance claims were all reported as factors aggravating recovery in manufacturing and services including tourism.
 40. A sector that emerges from the research as directly negatively impacted is the agriculture sector. Research from the Pacific highlights that natural disasters have proven a set-back in efforts to diversify merchandise exports, notably in the agriculture sector. Much the same conclusion can be drawn also from the Caribbean research. With a high proportion of merchandise exports originating in the agriculture sector, drops in agricultural exports have been precipitous (37% in Vanuatu after Cyclone Pam) and slow to recover, particularly for market segments with long production cycles e.g. tree crops.
 41. A further example of a disaster “double-whammy” emerged from the St. Lucia research. Banana farmers there were still struggling with the after-effects of Hurricane Tomas (2010) when an outbreak of the soil-borne fungus black sigatoka further compounded their efforts to recover from hurricane damage. Changes in phytosanitary status were noted as a risk factor after disaster events and as a complicating factor in the recovery of fresh produce exports.
 42. Direct damage has also been reported to fisheries. In Fiji, tropical cyclone damage to coral reefs forced fish to migrate thus reducing local catches. Similar effects were reported in Tonga where Tropical Cyclone Ian caused damage to the fisheries sector. World Bank research suggests that the fisheries sector in Dominica is “extremely vulnerable to hurricanes and storms”. Consequently, capital losses tend to be high in every major storm.
 43. Among the different sectors surveyed, services fared the best in terms of its speed of recovery, albeit with some important caveats. One of the fastest service sectors to recover was tourism – and important and growing area of economic activity for all six Members surveyed. Among island states surveyed, the recovery of cruise tourism was quicker than overnight stays. The provision of accommodation as an integral part of the cruise offering seems to be an important factor in this regard. Factors holding back recovery in the overnight sector mirrored those constraining recovery more generally e.g. ability to refinance debt, access to credit, availability of and tariffs on building materials.
 44. The resilience of services, particularly tourism is positive, not least given the scope for diversification in outbound source markets among the six surveyed Members. For all of them, investment in upgrading trade connectivity (e.g. runway, port and airport upgrading) would both boost tourist arrivals, and also increase critical airlift capacity for future disasters.
 45. The research analysis identified areas where action is already being taken by the six Members to build resilience. Prominent is the topic of reform of customs and other border clearance systems where implementation of the WTO Trade Facilitation Agreement (TFA) is acting as a catalyst for reform. Further action here could also be envisaged, and not just in relation to implementation of the TFA disciplines. For example, there is further scope to work with regional partners e.g. the Caribbean Disaster and Emergency Management Agency and the Caribbean Customs Law Enforcement Council to promote coordination and mutual cooperation in the event of disasters. Similar action could be envisaged in other regions.
 46. Another key principle found in the Sendai Framework is that of “Build Back Better” (i.e. in a way that is risk-informed and resilient). Building codes and standards underpin this approach. Here the experience of Nepal is instructive. The housing reconstruction programme sought to rebuild through grants for housing reconstruction that required usage of earthquake-proof building techniques and materials. With much of these building materials used coming from imported sources, there is an interplay also with standards in international trade.
 47. Discussion in Dominica on how to ensure that building material imports meet local building codes (e.g. for corrugated sheet roofing) is indicative of a broader debate on the role of standards for resilience. Such standards also cover issues such as business continuity planning and involve a broad range of international and national standard-setting bodies.
 48. Import tariff policy can also influence resilience. Where the hardening of infrastructure is the option



- pursued to improve resilience, care is needed so that steel and cement tariffs do not act as a disincentive by pushing up prices and reducing usage of these materials. Import data from one of the regional reports indicate higher volumes of imports after tariffs were unilaterally reduced.
49. Government procurement is another avenue to pursue resilience, and one with an obvious trade dimension given the high trade to GDP ratios of the economies surveyed. Services are also an important dimension that emerges from the research. A particular services category where island Members struggled was in environmental services, notably the clearance of debris caused by hydro meteorological events. The clearance efforts needed surpassed the capacity of local service suppliers to manage. *Ex ante* international tendering of such services could help bring down costs rather than reliance on *ex post* clean up.
 50. Expanding renewable sources of electricity generation was another action identified as both boosting resilience and economic performance. The import of liquid fuels is a major drain on the balance of payments among the Members surveyed. Further development of hydro-electrical (Nepal), geothermal (Dominica) and other renewable energy sources were considered actions that could improve both the current account situation and also economic resilience.
 51. All six States surveyed demonstrate a significant insurance protection gap. Expansion of insurance coverage would support resilience. Innovation in sovereign insurance products through vehicles through the Caribbean Catastrophe Risk Insurance Facility and its Pacific equivalent has pioneered the use of quick-disbursing parametric insurance schemes (i.e. schemes that pay out when certain pre-defined parameters are met, not on the basis of actual damage).
 52. The role that the “weather enterprise” can play in disaster resilience and reduction emerged strongly. The Caribbean research highlighted not just the potential of such services for disaster resilience, but also for economic efficiency gains.
 53. The stated intention of the Dominican Government to become the first climate-resilient nation is recognition of the need to break the cycle of periodic disasters and debt distress. IMF research suggests that a do-nothing policy will deliver dramatic negative economic outcomes, with large permanent losses of capital, output, and growth.
 54. The three country research papers suggest that trade, and trade policy, can play a role in achieving the objective of furthering disaster resilience. The research has borne out how the economic impact of disasters can be magnified by trade policy measures, but also how trade measures can improve disaster response, recovery and resilience.





Introduction



Introduction

55. On 26 April 2018, the World Trade Organization (WTO) Committee on Budget, Finance and Administration approved a grant offered by the Mission of Australia to the WTO Secretariat to undertake research on natural disasters and trade.
56. The current report focuses on understanding the frequency of natural disasters, the factors that influence risk and the trade impacts as captured in trade policy reviews, economic research and post-disaster needs assessment reports. This analysis can be found in section 1 of this report. The report also presents the results of research on six recently disaster-affected countries. Country research was undertaken over the period of April 2018-February 2019 in Dominica, Fiji, Nepal, St Lucia, Tonga and Vanuatu. This can be consulted in Section 2.
57. Annex 1 outlines hazards, disasters and measures reported in WTO Members' Trade Policy Reviews over the period January 2010 to September 2019). Annex 2 examines the trade impacts reported in selected post-disaster needs assessments.
58. In Annex 3, summaries of the Symposia held on Natural Disasters and Trade can be found. A total of four Symposia were held. A first **Symposium** was held at WTO on 26 April 2018 and examined the nexus between natural disasters and the multilateral trading system. It identified issues to be studied in the research work. On 14 December 2018, a second **Symposium** surveyed hazards, risks and losses from natural disasters and outlined the economic case for investing in resilience. Also discussed was a preliminary scoping of issues arising from the WTO research. A third **Symposium** was held on 10 May 2019 at which research was presented that examined the economic and trade impacts of natural disasters on six recently disaster-affected Members (Dominica, Fiji, Nepal, Saint Lucia, Tonga and Vanuatu). At the Symposium, the research was validated by representatives of the Members concerned. A fourth Symposium was held on 29 November 2019 at which the research results was presented (to be added).
59. Annex 4 contains a bibliography listing sources. The report has been drafted from a variety of sources and using different methods, ranging from existing published sources to in-country interviews.



Section 1: Natural disasters and trade – An Overview



Overview

60. There is growing awareness of the risk of economic and trade disruption caused by natural hazards. The World Economic Forum's Global Risks Report 2018, ranks "extreme weather events" and "natural disasters" as the number one and number two risks most likely to occur in the next ten years by a multi-stakeholder panel.¹ The WEF report underscores concerns about the systemic challenge that rests in the "depth of the interconnectedness that exists both among these environmental risks and between them and risks in other categories" (WEF 2018).
61. Similar concerns are expressed in the 2019 Global Assessment Report on Disaster Risk Reduction published by the United Nations Office for Disaster Risk Reduction (UNDRR). The report notes "Current approaches to risk measurement and management are inadequate to meet the challenges of the multi-faceted interconnectedness of hazard, the barely understood breadth of exposure, and the profound detail of vulnerability; this inadequacy must be addressed if we are to ever do more than simply treat the symptoms" (UNDRR 2019).²
62. This report seeks to promote understanding within the trade and disaster risk reduction communities about the interconnections between natural hazards and trade, both at an observational level (e.g. changes in trade flows) and from a policy perspective (e.g. trade measures that can mitigate or exacerbate exposure to, and the effects of, natural risks). The focus of the present study is on the former i.e. on trade effects of natural disasters. A separate study drafted in the form of a legal mapping examines trade and natural disasters from the perspective of measures that can be taken to mitigate, or which may exacerbate, exposure to natural hazards.
63. The research presented in this report highlights that natural disasters and trade interact in complex, and often unexpected ways, as well as in different dimensions, including at a macro or economy-wide level in disaster-affected countries, and at a sectoral, product or firm level. One important function that trade performs is that of a "shock-absorber" for natural disasters. Open markets function as risk-reducing arrangements that allow gaps between desired consumption and output, which occurs when domestic production is suddenly reduced by a natural disaster, to be filled by the international flows of goods (Yang, 2008). International trade smooths out the disruptive effect of natural disasters on consumption by allowing countries to diversify the sources of consumption and production inputs from across countries (Casilli et al, 2015).
64. Put simply, trade allows the shortage of goods or services caused by shocks in one location to be covered by imports from other unaffected places. Imports provide a vital channel for making goods and services available that may be in short supply in a disaster-struck country. Such goods and services include food, medical supplies, emergency equipment and expertise to aid relief and recovery efforts. A case in point is global food security which is underpinned by trade in a few crops and fertilizers. Each year, the world's transport system moves enough maize, wheat, rice and soybean to feed approximately 2.8 billion people.³
65. Country research conducted for this study underscores the critical role that imports play also in recovery and reconstruction. Imports of spare parts and machinery are essential to restart economic activity across many sectors of the economy. For example, power generation equipment is often in urgent need in the aftermath of a natural disaster. Less apparent, but nonetheless essential, is the import of other machinery, e.g. refrigerators for cold chain dependent activities in food and pharmaceutical manufacturing and retail distribution. Many other examples of imports critical for recovery emerged from the country research. As a general rule, the more severe the damage inflicted by a natural disaster, the broader the range of different goods and services that may need to be imported. It is also worth noting countries in need of imported goods may not have immediate access to them as natural disasters frequently damage or disrupt trade-infrastructure.
66. Cross-border financial services, including insurance, are another example of how trade can cushion the impact of a natural hazard. Such services help to shift the financial burden of recovery and reconstruction from the public purse toward the private sector. A 2012 study by the Bank of International Settlements (BIS), looked at nearly 2,500 major natural catastrophes that occurred between 1960 and 2011. The study concluded that, in countries with higher insurance penetration, the indirect costs of a natural catastrophe event were lower, the overall economic impact was lower, and these countries recovered faster from catastrophic events than in less-insured countries.⁴
67. Reinsurance services provided by foreign suppliers are a further element to consider in this regard as this allows risk to be pooled across and between

1 "Global Risks Report", 2018, World Economic Forum Available at: <https://www.weforum.org/agenda/2018/01/the-biggest-risks-in-2018-will-be-environmental-and-technological/> The report is based on a survey of nearly 1,000 experts and decision-makers who assess the likelihood and impact of 30 global risks over a 10-year horizon.

2 "Global Assessment Report on Disaster Risk Reduction", 2019, United Nations Office for Disaster Risk Reduction.

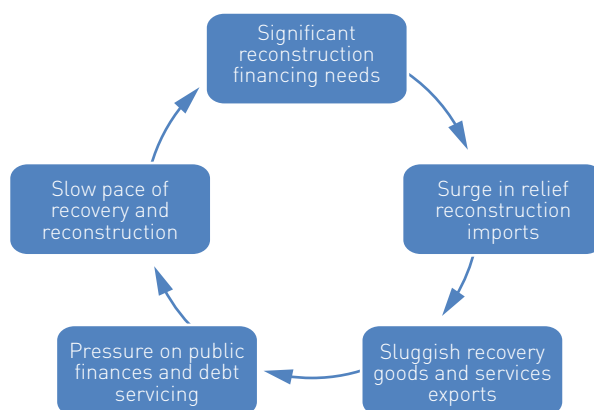
3 "Chokepoints and vulnerabilities in global food trade", Rob Bailey and Laure Wellesley, Chatham House Report, June 2017 Available at: <https://www.chathamhouse.org/publication/chokepoints-vulnerabilities-global-food-trade>.

4 "Unmitigated disasters? New evidence on the macroeconomic cost of natural catastrophes", (2012), Goetz von Peter, Sebastian von Dahlen, Sweta Saxena Bank for International Settlements working papers, no 394 Available at: <https://www.bis.org/publ/work394.htm>.



- countries. “International reinsurance markets can contribute to risk management by enhancing the capacity of primary insurance markets to offer coverage and supporting their availability to manage catastrophe risks. The global nature of these markets provides an eternal source of funding for recovery and reconstruction which should help reduce the economic and insurance market disruptions that often follow large catastrophe events.”[OECD 2018].⁵ The country research also highlights that income remitted by nationals from abroad can act as an important fiscal buffer for businesses and households. In two of the countries studied, income remitted from nationals abroad accounts for more than 25% of the home country’s GDP.
68. Construction services offer another example. The need to rebuild roads, railways, ports and buildings after a natural disaster are often fulfilled by imports of construction services. Engaging foreign construction companies to participate in the reconstruction often provides access to technology and know-how, for example, in the form of building materials and construction services to “build back better”. This can play a critical role in reducing future exposure to natural hazards.
 69. Additionally, access to services, such as hydro-meteorological forecasting and early warning, can also help governments and firms understand their exposure to hazards and take steps to limit their risk. Resilience can also be enhanced by the effective development of trade-related infrastructure, which comprises both hard infrastructure, such as buildings and transport networks, and soft infrastructure, such as institutions and regulations (UNCTAD, 2018).
 70. A further dimension to the shock-absorbing role of trade is the ability to pursue intertemporal adjustment. Disaster struck countries may run current account deficits in periods of difficulty and pay down debt through current account surpluses in better years. One factor influencing the speed with which debt can be consolidated is export performance. Exports of goods and services broaden demand beyond the confines of the national market (which may be depressed in the aftermath of a disaster) so providing producers in a disaster-struck country with an outlet and generating an essential source of foreign exchange revenue. Macroeconomic aspects of the economy, such as economic diversification, access to domestic credit, availability of fiscal space, large reserve buffers, less open capital accounts, affect the economic cost and contribute to the coping capacity with disasters (IMF, 2017).
 71. One problem highlighted in the economic literature is the impact that natural disasters may have on export performance of disaster-affected economies. Typically, disasters disrupt normal economic activity due to loss of production, human and physical capital and/or infrastructure, leading to a contraction in output. Natural disasters may cause damages to transport infrastructure and increase logistical costs, thus deterring trade.
 72. The initial loss of assets caused by a natural disaster may trigger a loss of output, altering the production and export capacity of the country. Some businesses may never recover from a disaster. The wider negative impacts can linger for years, undermining long-term competitiveness and sustainability. Market share may be lost as clients transfer their business to competitors; skilled workers move to find other jobs; relationships with suppliers and retailers are severed; and business image and reputation may be permanently damaged (UNDRR 2013). The country research also highlights that some export product categories (e.g. tree crops) can take close to a decade to recover.
 73. Stagnant or falling foreign exchange revenue generated by exports of goods and services can further aggravate the financing difficulties faced by disaster-affected governments. Figure 1. explains how sluggish recovery in exports of goods and services can add further pressure to the financing gap when disaster losses exceed the fiscal capabilities of a disaster-affected government. A surge in relief and reconstruction imports, accompanied by sluggish recovery in goods and exports, puts pressure on a country’s public finance and debt servicing, which in turn restrains the capacity to recover and reconstruct after a natural disaster. Natural disasters are the second principal cause of materialization of contingent liabilities for emerging market nations after banking crisis, provoking downgrades of their sovereign creditworthiness scores (Moody’s Investors Service, 2016).
 74. A country can be impacted by a new disaster before it has fully recovered from a previous disaster, leading to the situation where resources are consumed by repairs at the expense of infrastructure financing and productive investment, a vicious circle that traps the disaster-affected state in a low or no-growth equilibrium (Hallegatte & Przyluski, 2010). Businesses are more likely to recover faster in a country where governments have the capacity to invest in reconstruction or where they have risk financing measures in place that cover most contingencies (UNDRR 2013).
 75. It is important to recognize is that trade can also expand exposure to a natural hazard, as well as help mitigate its impact. Even if a natural disaster is generally localized, its aftermath can be felt across countries that were not directly affected by the disaster. One way that this can occur is through the disruption of a link in a global value

5 “The contribution of reinsurance markets to managing catastrophe risk”, 2018, OECD Available at: <https://www.oecd.org/daf/fin/insurance/the-contribution-of-reinsurance-markets-to-managing-catastrophe-risk.htm>.

Figure 1: Sluggish export recovery can add to pressure on public finances

Source: Author, adapted from Hallegatte & Przyluski (2010)

chain that includes many firms and countries through downstream and upstream linkages. How significant these effects are will depend on the specificity of the goods and services that are produced and the complexity of the different interactions in the chain.

76. A 2013 assessment by the UN stated that business decentralization and outsourcing had “dramatically increased the exposure of businesses and their supply chains to devastating hazards”.⁶ As supply chains become globalized, the interruption of one critical node or link produces regional and global ripples throughout the network (UNDRR 2013). A critical distinction here is that the transmission of natural disaster shock tends to be specific to a particular sector, industry or even firm. If other suppliers are available, trade may again help mitigate the impact through access to alternate sources of supply.
77. The disaster risk reduction community recognise that there is no such thing as a natural disaster, only natural hazards (UNDRR 2019). This statement was echoed by Elhadj As Sy, Secretary General, International Federation of the Red Cross and Red Crescent Societies at the First Symposium on Natural Disasters and Trade held at WTO in May 2018. In his contention “Shocks and hazards may be natural, but disasters depend on us, on what we do on time or what we fail to do on time.” Following this argument, natural disasters represent a failure of risk management. Relevant in this context is the Sendai Framework for Disaster Risk Reduction 2015-2030.
78. The Sendai Framework aims to achieve “the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.” (UNDRR 2015).⁷ To attain this aim, the goal of strengthened resilience is pursued. The Sendai Framework seeks to “prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.”
79. The Sendai Framework defines resilience as “the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.” It refers to a mixture of three properties. One, the readiness of society to face any type of external event; two, its ability to provide an efficient response to this event, and three, its capacity to recover or exceed the original state after the disruptive event (Ponomaroy and Holcomb, 2009).
80. Box 1 below outlines the seven targets set out in the Sendai Framework for Disaster Risk Reduction. Directly or indirectly, the multilateral trading system will influence the attainment of several, if not all, of these targets.
81. In this context, trade has a role to play in promoting resilience and supporting response and recovery after a disaster. Furthermore, an open, rules-based trading system can support resilience in

⁶ “From Shared Risk to Shared Value: The Business Case for Disaster Risk Reduction”, Global Assessment Report on Disaster Risk Reduction”, 2013, UN Office for Disaster Risk Reduction.

⁷ Sendai Framework for Disaster Risk Reduction 2015-2030, UNDRR https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf.



Box 1: The Sendai Seven – Targets for Disaster Risk Reduction

- (a) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015;
- (b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015;
- (c) Reduce direct disaster economic loss in relation to global gross domestic product by 2030;
- (d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including by developing their resilience by 2030;
- (e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;
- (f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030;
- (g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

Source: Sendai Framework for Disaster Risk Reduction 2015–2030 <http://www.unisdr.org/we/inform/publications/43291>

the face of natural disasters. Some economic evidence suggests that countries with an open and competitive market are better prepared for a disaster, better able to respond when it strikes, and able to recover more quickly in the aftermath.

Geophysical and hydro-meteorological disasters – frequency and distribution

82. This report considers natural disasters through the lens of geophysical and hydro-meteorological hazards. Geophysical disasters examined encompass such phenomena as earthquakes, tsunami, volcanic eruptions and landslides. Hydro-meteorological disasters studied include floods, storms, drought and extreme temperature events (also referred to as weather and climate-related disasters).⁸ After a discussion of some of the shortcomings of existing data, this section considers the frequency of natural disasters and their distribution regionally. The analysis highlights headline messages from a variety of different sources, it is not meant to be an exhaustive analysis. A fuller picture can be obtained from the cited sources.
83. A starting point for research on natural disasters and trade is data on past frequency and impacts. However, various difficulties immediately arise in this regard. A first concern is that of the

completeness of the related data sets. Work by the OECD concludes that data on the economic impact of disasters are sparse, especially for smaller-scale disasters. The most comprehensive international repositories of information on past disasters contain data on the economic impact of less than half of the recorded disaster events (OECD 2018).⁹ Data reported to the Emergency Events Database (EM-DAT) is the basis of analysis in this section, it is however worth noting that this database may be subject to a number of shortcomings. Most disaster reports made to the EM-DAT (63%) contain no data on economic impact.¹⁰ This is particularly acute in Africa where economic cost data is available for less than 14% of disasters (UNDRR 2018). Where data is reported, it tends to be in the form of direct impacts. The result is under-reporting of the frequency and economic impacts of natural disasters.

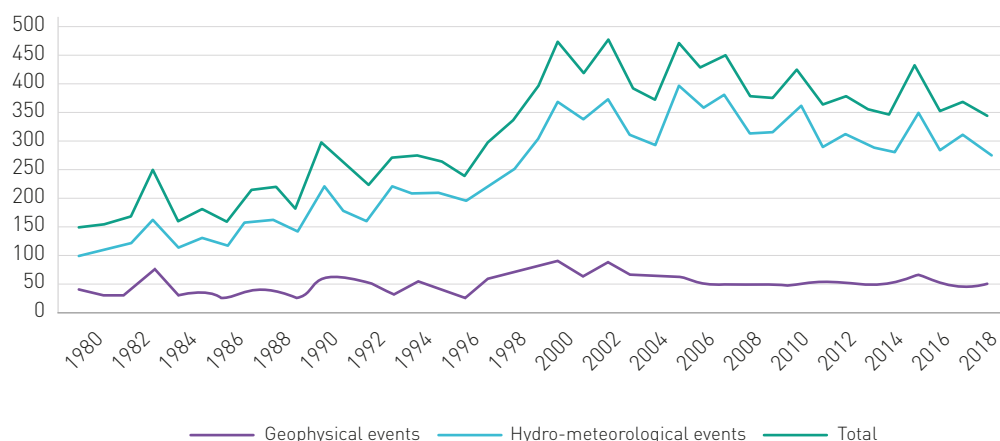
84. A further constraint is that small, but frequent disasters tend to be unreported, and their effects underestimated. In low and middle-income countries, accumulated losses from small-scale and localised disaster events approach the same magnitude of those from major disasters (UNDRR 2013). One study shows that the cumulative losses from smaller events were 2.5 times greater than large catastrophic events in Colombia (The World Bank, 2013). Furthermore, there seems a large

⁸ Climatological events, sometimes treated as a separate category, are considered within the ambit of geophysical and climatological disasters for the purpose of the analysis, unless otherwise indicated.

⁹ "Assessing the Real Cost of Disasters: The Need for Better Evidence", OECD Reviews of Risk Management Policies, 2018, OECD Available at: <https://www.oecd.org/gov/risk/assessing-the-real-cost-of-disasters-9789264298798-en.htm>.

¹⁰ The Centre for Research on the Epidemiology of Disasters (CRED) was established in 1973 as a non-profit institution, with international status under the Belgian Law. In 1988, CRED launched the Emergency Events Database (EM-DAT). The database contains data on the occurrence and effects of over 22,000 mass disasters in the world from 1900 to the present day. The database is compiled from various sources, including UN agencies, non-governmental organisations, insurance companies, research institutes and press agencies. It has collaborative status with the United Nations Department of Humanitarian Affairs, and also works in collaboration with the European Union Humanitarian Office, the International Federation of the Red Cross and Red Crescent, the Office of Foreign Disaster Assistance of USAID.



Figure 2: Natural disasters events 1980 – 2018

Source: Emergency Events Database (EM-DAT)

number of underreporting of small disasters, such as floods, and the impact of underreporting events on trends is substantial (Paprotny, Sebastian, Morales-Nápoles, & Jonkman, 2018).

85. A further issue in relation to the data available is that this information is often gathered from diverse sources, and with different aims. The disaster events covered in the EM-DAT database is mostly based on insurance claims or news stories, in addition to being non-exhaustive, the coverage of the data may strongly correlate with the income level of the country affected. There is no standard methodology for assessing disasters' economic impacts. Furthermore, where data are available, it is often not clear to what extent the estimates include both disaster damage (direct economic impacts) and losses (indirect economic impacts). Often, assessments rely on information on insured losses which does not necessarily capture the full economic impact of a disaster (OECD 2018). An example here is that global losses from natural disasters were an estimated USD 337 billion in 2017, of which insurance covered losses were only close to USD 144 billion (Swiss Re, 2018).¹¹
86. A further, more fundamental criticism of the use of the historical record as a guide for future action is that past experience is not a good predictor for future events. As pointed out in a publication of UNDRR, "Existing approaches to understanding risk are often based on the largest and most historically obvious and tractable risks for humans, rather than on the full topography of risks. Most models draw on historical data and observations, assuming that the past is a reasonable guide to the present and the future" (UNDRR 2019). Instead, a probabilistic approach to risk modelling is recommended which looks at the likelihood of a particular hazard in a specific location (e.g. a one-in-250-year earthquake has a 0.4% probability of outcome in any given year). In the face of a

known-hazard, the probability that future exposure will follow past trends cannot be necessarily be assumed.

87. With these shortcomings in mind, the analysis proceeds to examine the frequency of natural disasters reported to the Emergency Events Database (EM-DAT). World-wide, some 11,178 geophysical and hydro-meteorological disasters were recorded in the period 1980-2018 (EM-DAT 2019) – see Figure 2. below. Over the past 35 years, the number of disasters has increased, primarily driven by increases of floods and storms on the global scale (Moody's Investors Service, 2016).
88. The number of natural disasters, especially hydro-meteorological disasters, recorded has been on the rise in recent years. This reflects improvements in disaster surveillance and reporting as well as increasing risks of climate change related disasters. By some account, hydro-meteorological disasters have risen almost fivefold in occurrence (WMO 2014). In addition to the growing burden of hydro-meteorological events, Figure 2 also highlights considerable variation in the number of reported disasters annually.
89. Table 1 provides an overview of natural disasters occurring in 2018, as compared to the average annual incidence of such events over for the period 1980-2017. The table underscores the variation in the year-on-year incidence of disasters world-wide, in terms of their number and the hazard at the origin of a particular disaster event.

¹¹ "Closing the protection gap: Disaster risk financing: Smart solutions for the public sector", 2018, Swiss Re, Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/Closing_the_protection_gap.pdf.

Table 1: Geophysical and hydro-meteorological events in 2018 as compared to annual average for the period 1980-2017

Nature of hazard	Number of disaster events	
	2018	Average 1980-2017
Geophysical hazards	29	31
Hydro-meteorological hazards	286	255
Total	315	285

Source: Emergency Events Database (EM-DAT)

90. In 2018, there were fewer geophysical events as compared to the average number of events for the period 1980-2017. The geophysical events however have caused a much larger death toll than previous years. In June 2018, the Volcán de Fuego eruption in Guatemala killed over 400 people and affected more than 1.7 million; in September, the Sulawesi earthquake and tsunami in Indonesia caused an estimated death toll of over 4000 people; and in December, the eruption of Anak Krakatau, again in Indonesia, triggered a tsunami killing more than 430 people. Nearly half of all deaths recorded globally in 2018 from natural disasters were registered in Indonesia (EM-DAT 2019).
91. As Table 2 below highlights, geophysical hazards (earthquakes and volcanoes) accounted for 56% of all deaths reported in the period 1998-2017, but only 9.2% of natural disaster events. Two major geophysical events, the 2004 Indian Ocean tsunami and Haiti earthquake, stand out for their death toll. While mortality associated with other categories of risk has fallen, disparities also exist between countries in mortality associated with disasters. In low-income countries, an average of 130 people died per million living in disaster-affected areas, compared to 18 in high income countries (UNDRR 2018).

Table 2: Number of disasters, economic damage and deaths by hazard (1998-2018)

	Flood	Storm	Earth-quake	Extreme Temp.	Land-slide	Drought	Wild-fire	Volcanic activity
Number of disasters	3,148	2,049	563	405	378	347	254	99
Percentage of total reported disaster	43.4%	28.2%	7.8%	5.6%	5.2%	4.8%	3.5%	1.4%
Value of recorded losses in USD billions	656	1,330	661	61	*	124	68	*
Percentage of total reported losses	23%	46%	23%	2%	*	4%	2%	*
Total number of deaths	142,088	232,680	747,234	166,346	18,414	21,563		2,398
Percentage of total reported deaths	11%	17%	56%	13%	1%	2%		0.1%

* Landslides and volcanic activity are together estimated to account for USD8 billion in economic damage, less than 1% of total damage in the period 1998-2017.
Source: UNDRR 2018

92. Over the period of 1998 to 2017, disaster-hit countries reported total direct economic losses valued at USD 2,908 billion, of which climate-related disasters caused USD 2,245 billion or 77% of the total. This figure is up from 68% (USD 895 billion) of losses (USD 1,313 billion) reported between 1978 and 1997. Overall, reported losses from extreme weather events rose by 151% between these two 20-year periods. (UNDRR 2018).¹²
93. Table 3 below highlights the upward trend in economic damage caused by natural disasters. In 2018, the economic cost of natural disasters was 55% higher (USD 130.65 billion) than the annual average damage recorded for the period 1980-2017 (USD 84.25 billion).

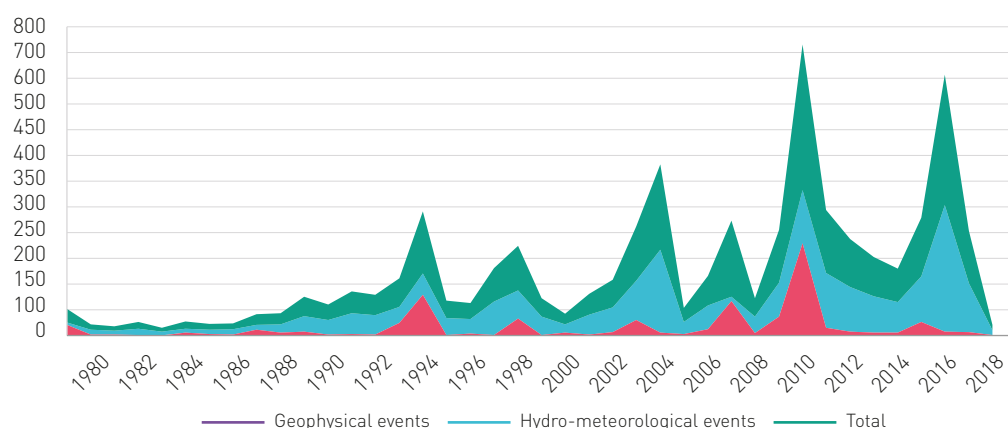
12 "Economic Losses, Poverty & Disasters 1998-2017", Centre for Research on the Epidemiology of Disasters and UN Office for Disaster Risk Reduction 2018 Available at: https://www.unisdr.org/files/61119_credeconomiclosses.pdf.

Table 3: Damage from geophysical and hydro-meteorological events in 2018 and on average for the period 1980-2017

Nature of hazard	Total recorded damage in US dollar billions	
	2018	Average 1980-2017
Geophysical hazards	7.98	20.9
Hydro-meteorological hazards	122.67	63.35
Total	130.65	84.25

Source: Emergency Events Database (EM-DAT)

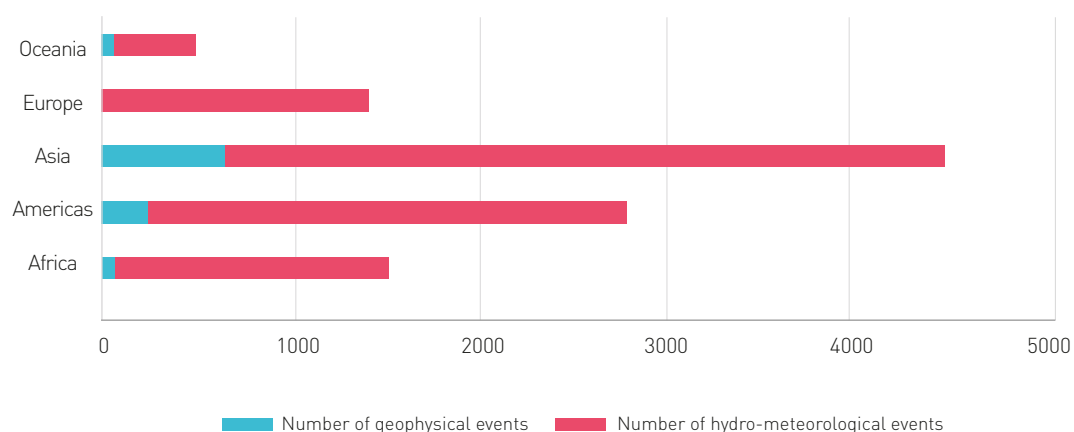
94. The growing economic burden of natural disasters is also captured in IMF and World Bank research. Direct and indirect economic damage has grown from \$70 billion per year on average in the 1990s to \$113 billion per year since 2000 (IMF, 2017). Weather-related disasters accounted for 74% of total economic losses, and 87% of the total number of disaster events, per year over the period 1980 – 2012 (World Bank, 2013).
95. Economic losses from weather- and climate-related disasters have increased, but with large spatial and interannual variability (IPCC 2012). Figure 3 gives an overview of reported global losses for geophysical and hydro-meteorological as captured by CRED in its Emergency Events Database. Six peaks are visible in these data. These peaks correspond to a series of so-called “mega-disasters”, which affected some mainly high-income and middle-income countries:
- The Kobe earthquake (1995);
 - Earthquakes in Chinese Taipei and Turkey, Typhoon Bart and Sydney hailstorm (1999);
 - Indian Ocean Tsunami (2004);
 - Hurricane Katrina (2005);
 - Sichuan earthquake (2008);
 - Christchurch earthquake and Tohoku earthquake and tsunami (2011);
 - Atlantic hurricane season (including Hurricanes Harvey, Maria and Irma) (2017).

Figure 3: Reported losses for geophysical and hydro-meteorological disasters (1980-2018) in US dollar billions

Source: Emergency Events Database (EM-DAT)

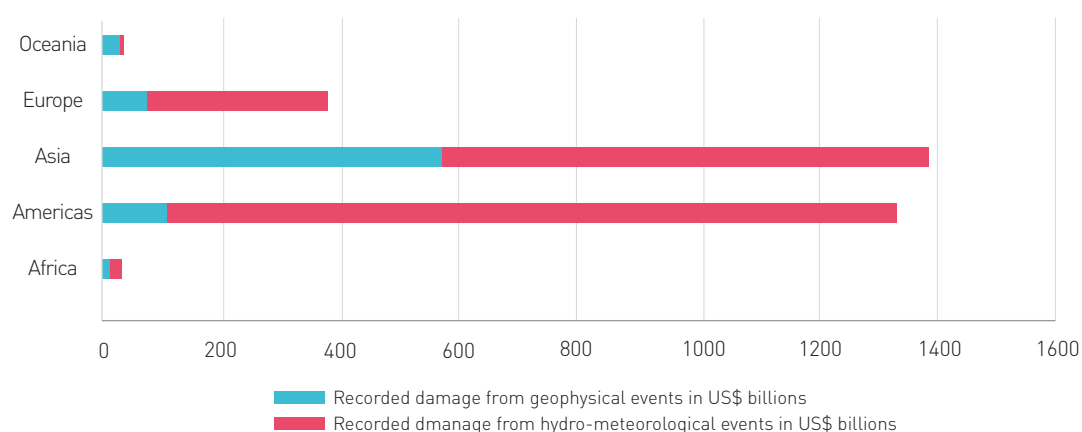


Figure 4: Regional breakdown of geophysical and hydro-meteorological disaster events (1980-2017)



Source: Emergency Events Database (EM-DAT)

Figure 5: Regional breakdown of reported damage from geophysical and hydro-meteorological disaster events 1980-2017 in US dollar billions



Source: Emergency Events Database (EM-DAT)



96. Figure 4 and Figure 5 below provide an overview of the distribution of geophysical and hydro-meteorological disasters by region, both in terms of the number of events reported and in terms of reported economic damage. Looking at the occurrence of events, Asia records the highest number of both geophysical and hydro-meteorological disasters. Since 1970 a person living in the Asia-Pacific region has been five times more likely to be affected by natural disasters than a person living outside the region (UNESCAP 2018).¹³
97. Figure 5 highlights that geophysical events, while accounting for only 15% of all disaster events, are responsible for 41% of total recorded damage in Asia. Recorded damage in the Americas were 95% of those recorded in Asia, even though the number of events was some 40% lower over the same period. This may be due to the higher value of assets destroyed or damaged by natural disasters in the Americas.
98. Looking at disaster loss statistics over the period 1998-2017 by country, the United States recorded the biggest losses resulting from natural disasters (USD 945 billion), reflecting high asset values as well as frequent events. China, by comparison, recorded a higher number of disasters than the United States (577 in comparison with 482), but lower total losses (USD 492 billion) (UNDRR 2018). Table 4 below lists the countries or territories recording the highest monetized losses over the period 1998-2017 as reported to the EM-DAT database.
99. The economic losses caused by natural disasters have been on the rise. Data from the U.S. National Oceanic and Atmospheric Administration (NOAA) highlights that the number of what it terms “billion-dollar disasters” has grown in recent times. The annual average such large disasters in economic costs for the period 1980–2018 is 6.3 events, this average rises to 12.6 events annually in the most recent 5-year period (2014–2018).¹⁴ Since 1980, the US has recorded 254 hydro-meteorological disasters where the overall damages or costs reached or exceeded \$1 billion.
100. The impacts of disasters tend to be more eye-opening in smaller economies, such as those in the Pacific, when expressed relative to national population or GDP. From 2000-2018, 11% of the residents of the Pacific island economies were affected by disasters, and economic losses equalled 7% of GDP (ADB 2019).¹⁵ And a similar pattern can be observed in Caribbean region and other small economies].¹⁶
101. It is also worth noting that the global weather- and climate-related disaster losses reported over the last few decades reflect mainly monetized direct damages to assets and are unequally distributed. These reported losses are lower bound estimates because many impacts, such as loss of human lives, cultural heritage, and ecosystem services, are difficult to value and monetize, and thus they are poorly reflected in estimates of losses. Impacts on the informal or undocumented economy as well as indirect economic effects can be very important in some areas and sectors but are generally not counted in reported estimates of losses. For the reasons set out above, historical economic data tends to undervalue the impact of natural disasters and may mask underlying risks that may not have manifested themselves during the reporting period.
102. In conclusion, this section set out to discuss the temporal and geographical distribution of hydro-meteorological and geophysical natural disasters. The reported number of natural disasters has been on the rise, potentially due to higher disaster risks and better reporting system, with the total economic damage growing over time. In terms of geographical distributions, Asia is the region struck by the highest number of natural disaster events, although the Americas follows closely in terms of the total economic losses. Measured by economic damage relative to population or GDP, small economies stand out as most affect by natural disasters.

Table 4: Countries recording the highest monetized losses in USD billions (1998-2017)

	Absolute losses in USD billions
USA*	944.8
China	492.2
Japan	376.3
India	79.5
Germany	57.9
Italy	56.6
Thailand	52.4
Mexico	46.5
France	43.3

* Additionally, Puerto Rico recorded losses of USD 71.7 billion over the same period.

Source: UNDRR 2018

13 “Leave No One Behind: Disaster Resilience for Sustainable Development Asia-Pacific Disaster Report 2017” 2018, UNESCAP. Available at: <https://www.unescap.org/publications/asia-pacific-disaster-report-2017-leave-no-one-behind>.

14 “U.S. Billion-Dollar Weather and Climate Disasters” (2019) NOAA National Centers for Environmental Information (NCEI). <https://www.ncdc.noaa.gov/billions/>.

15 “Asian Development Outlook 2019 – Strengthening Disaster Resilience”, April 2019, Asian Development Bank Available at: <https://www.adb.org/publications/asian-development-outlook-2019-strengthening-disaster-resilience>.

16 Ibid.



Factors influencing natural disaster risk

103. Natural disasters are the consequences of events triggered by natural hazards that overcome local response capacities within a vulnerable and exposed population and seriously affect the social, political and economic development of a region. A natural hazard by itself need not constitute a disaster, as it must combine with a society's exposure and vulnerability to turn into a disaster. As such, no disaster is purely natural (ADB 2019).
104. Countries with comparable exposure to natural hazards may face very different disaster risk and outcomes. One illustrative example is borne out by comparing the natural hazards faced by Haiti and New Zealand. According to one index of disaster risk, Haiti and New Zealand are both "highly exposed" to geophysical hazard (World Risk Index, 2015). However, their vulnerability to the same hazard diverges due to very different levels of vulnerability. According to the World Risk Index, Haiti ranks 21st among the countries facing the highest risk, while New Zealand comes in at 119th place. More stringent building codes and land use planning, high rates of insurance coverage, lower population density, greater economic diversification and higher income are just some of the factors that make New Zealand rank less vulnerable than Haiti to the same risks.
105. The economic impacts of earthquakes in Haiti and New Zealand in 2010 and 2011 fully illustrates different outcomes of natural hazards of similar scale. In Haiti, an earthquake with the magnitude of 7.3 on the Richter scale that struck on 12 January 2010 took the lives of more than 222,000 people and caused more than 300,000 injuries. The total value of damage, losses and economic impacts was estimated at USD7.8 billion by the World Bank, equivalent to 112% of Haiti's GDP.¹⁷ In the same year, an earthquake of magnitude 7.1 degree hit New Zealand on 4 September 2010, with an aftershock of 6.3 degree on 22 February 2011. The sequence of events resulted in 185 deaths and are estimated to have cost NZD 30 billion (USD 20 billion) in damage, with rebuilding costs estimated at 10% of GDP.¹⁸
106. This example of how similar hazards can result in different outcomes is further underscored by a comparison with Chile, which was also hit by an earthquake in 2010. The quake on 27 February 2010 was measured at 8.8 degree on the Richter scale and at the time was the fifth largest earthquake ever recorded. Economic losses totalled \$30 billion USD or 17% of the GDP of the country. Twelve million people were in areas that felt strong shaking, yet only 521 fatalities were recorded, with an additional
- 56 people losing their lives in the tsunami caused by the earthquake.¹⁹
107. While every society is vulnerable to risk, some suffer significantly more and recover more slowly than others when adversity strikes. Hazard identification is only an initial step within a risk management strategy. While the intensity of a natural hazard remains important, of greater importance is the profile of a population whose economic, demographic, environmental, institutional and social characteristics may place its members at greater risk before, during and after a disaster (UNDRR 2019). The rest of this section discussed vulnerability, with a focus on the economic and trade dimension to this component of disaster risk.
108. As a starting point, Box 2 lists the terms commonly used to describe disaster risk and their definitions.²⁰
109. While the damage caused by disasters is naturally related to the physical intensity of the event (i.e., the severity of a storm or earthquake), some research has identified a series of economic, social, and political characteristics that also affect vulnerability. These characteristics are potentially amenable to policy action.
110. One of the conditions that may increase a country's susceptibility to the impact of natural disasters is its level of economic development. Kahn (2005) finds that while richer countries do not experience fewer or less severe natural disasters, their death toll is substantially lower. In 1990, a poor country (per capita GDP < \$2000) typically experienced 9.4 deaths per million people per year, whereas a richer country (per capita GDP > \$14,000) would have had only 1.8 deaths. This difference is most likely due to the greater amount of resources spent on prevention efforts and legal enforcement of mitigation rules (e.g., building codes). In particular, some of the policy interventions likely to ameliorate disaster impact, including land-use planning, building codes and engineering interventions, are rare in less developed countries (see, for example, discussion in Freeman et al 2003, and Jaramillo 2009).
111. In addition, countries with a higher literacy rate, better institutions, higher per capita income, higher degree of openness to trade, and higher levels of government spending are better able to withstand the initial disaster shock and prevent further spill/overs into the macro/economy (Noy 2009). Studies also find that better institutional quality, higher openness to trade, and higher financial openness help spur the economic reconstruction process so that the adverse effect of a natural disaster on per capita income is reduced (Felbermayr and Gröschl, 2013).

17 "Haiti earthquake PDNA: Assessment of damage, losses, general and sectoral needs", 2010, Government of Haiti and World Bank Group Available at: <http://documents.worldbank.org/curated/en/355571468251125062/pdf/701020ESWOP1190R0Haiti0PDNA020100EN.pdf>.

18 "Economic effects of the Canterbury earthquakes", December 2011, Parliamentary Library Research Paper, New Zealand Parliament. Available at <https://www.parliament.nz/en/pb/research-papers/document/00PLibCIP051/economic-effects-of-the-canterbury-earthquakes>.

19 "Report on the 2010 Chilean Earthquake and Tsunami Response", 2011, American Red Cross Multidisciplinary Team, Report on the 2010 Chilean earthquake and tsunami response: U.S. Geological Survey Open-File Report 2011-1053, v. 1.1, 68 p., available at <https://pubs.usgs.gov/of/2011/1053/>.

20 The definitions given are those given by the UN Office for Disaster Risk Reduction. Other definitions are also used at national or international level, and by other international organizations.



Box 2: Disaster risk management terminology

Disaster: "A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts."

Disaster risk: "The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity."

Hazard: "A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation."

Exposure: "The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas."

Vulnerability: "The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards."

Source: UN Office for Disaster Risk Reduction²¹

112. Developing countries are more exposed to disasters than developed nations.²² Over the period of 1980 to 2015, the average annual damage due to natural disasters was 1.5% of GDP in emerging economies, while 0.3% of GDP in developed nations. Additionally, in emerging nations, the average share of the affected population was 3.0% over the same period, compared to 0.4% in developed nations. The vulnerability of emerging nations is high not only because of high exposure but also because of less developed insurance markets. Over 40% of direct losses are covered by insurance in developed economies, while below 10% of losses are insured in middle-income economies and less than 5% in low-income countries (Moody's Investors Service, 2016). From 200-2018, developing Asia was home to 84% of the 206 million people affected by disasters globally each year (ADB 2019).
113. With low per capita incomes, poor levels of human capital development, low export and economic diversification and high economic and structural vulnerability, the 47 Least Developed Countries (LDCs) account for some of the world's poorest and most vulnerable nations to natural disasters. For landlocked LDCs (LLDCs), there are additional structural constraints and the cost factor of geography.²³ Some 17.5% of all the disasters recorded in the EM-DAT database over the period of 1998-2017 take place in LDCs. For reasons stated earlier in this section, this number almost certainly underestimates the total burden of events. Some 425,603 people are estimated to have lost their lives in LDCs due to natural disasters, with 388 million people affected and total damage estimated at USD 40.6 billion over the period 1998-2017. Earthquakes accounted for just 5% of events, but 56% of total deaths, and 36% of the projected monetary value of the damage. Floods and storms accounted for 75% of the disaster events recorded among LDCs and 60% of total damage.
114. Another condition that may affect the vulnerability to natural disasters is country size. Bigger countries in terms of population size, land area, or GDP have more assets exposed, and therefore direct damages — in absolute terms — may be higher. Cavallo et al (2013) find that different measures of country size are associated with more direct economic damages of natural disasters. However, bigger countries may be more diversified and capable of engineering the inter-sectoral and inter-regional transfers required to mitigate the economic impact of natural disasters. For example, even by their size alone, large developed countries can more easily absorb output shocks from natural disasters originating in certain regions of the country (Auffret, 2003). Therefore, while direct losses may be high in large countries because of the wealth exposure, the greater capacity to absorb shocks means that indirect losses may be lower, and/or that the size of the damage may be lower relative to the size of the country. In addition, geographic location is a critical determinant of the physical vulnerability of certain countries or regions to different types of natural disasters. Small-island states, for example, are particularly vulnerable on this dimension (Rasmussen, 2004; Heger et al, 2008; Coffman and Noy, 2012).

21 United Nations Office for Disaster Risk Reduction (UNDRR) 2 February 2017 <https://www.unisdr.org/we/inform/terminology>.

22 "Understanding the Impact of Natural Disasters: Exposure to Direct Damages Across Countries" 2016, Moody's Investors Service, Available at: http://www.moody.com/viewresearchdoc.aspx?docid=PBC_1047662.

23 "Natural Disasters, Trade and LDCs", (2019), Vickers, B. and H. Enos-Edu Commonwealth Trade Hot Topics, No. 155, Commonwealth Secretariat, London, Available at <https://doi.org/10.14217/c5b9750a-en>.



115. The macroeconomic significance of natural disasters also depends on country conditions. In larger countries with more diversified or affluent economies, the impact is typically local in nature, with some combination of private insurance markets and central budgetary resources providing support to disaster-hit regions; the macroeconomic impact on the national economy is usually modest. By contrast, in countries that are geographically or economically small, where key sectors are dependent on weather conditions, and/or where private insurance markets are underdeveloped, the effects of such shocks on national economic activity and production capacity can be large (IMF 2019).²⁴
116. The impacts of disasters measured against GDP tends to be costlier for small developing countries. For small states with less than 1.5 million populations, the average economic cost per year for the period of 1950 – 2014 is equivalent to nearly 13% of GDP, while for larger states the cost is less than 1% of GDP (IMF, 2017).²⁵ In small states, about 10% of disasters resulted in damages equivalent to more than 30% of GDP, compared with 1% for other states (IMF, 2017).
117. To measure disaster loss, it is useful to express the economic damage as a percentage of GDP, which takes into account that smaller countries struck by a natural disaster may experience proportionally larger economic losses. From 1980 – 2015, the top five countries with the highest average annual loss as a percentage of GDP were mostly from small states, economically or geographically: Mongolia (20.1%), Maldives (18.5%), Belize (9.3%), El Salvador (8.5%) and the Solomon Islands (8.0%) (Moody's Investors Service, 2016).
118. Among small states, the small island economies in the Caribbean region are badly affected – see Box 3.
- Many Caribbean islands are among the 25 most-vulnerable nations in terms of disasters per-capita or land area, with their frequency and damages exceeding those for other small and larger states (Ötger and Krishna Srinivasan 2018). Since 1950, 324 disasters caused 250,000 fatalities and affected more than 24 million people in the Caribbean (IMF, 2017). Though Asia has been affected the most in terms of affected population and the total occurrences of disasters, the Caribbean has suffered the most from the highest damages in terms of a share of GDP (Moody's Investors Service, 2016).
119. A factor commonly cited as increasing exposure to natural hazard is urbanization. OECD (2018) point out that rapid urbanization, the accumulation of assets in seismic areas – and to some extent, increasing induced seismicity – have led to an increasing amount of earthquake risk in many parts of the world. Urbanization is in progress in hazard-exposure countries. The developing world is experiencing 90% of this urban growth, and it is estimated that 70 million new residents are added to urban areas in developing countries each year; infrastructure development cannot keep pace with growth. Low-income countries have seen a 300% increase in built-up areas and an 176% increase in population over the past 40 years. Informal settlements present an increasing challenge for municipalities, particularly in relation to flood and fire risk (UNDRR 2019).
120. Another factor cited in the scientific literature as influencing exposure to disaster risk are environmental degradation. Dust and sand storms, for example, are often caused by environmental damage. Land degradation in arid and semi-arid coupled with drought and desertification can increase the magnitude of effects from sand and dust storms (UNESCAP 2019).

Box 3: Caribbean vulnerability to natural disaster hazards

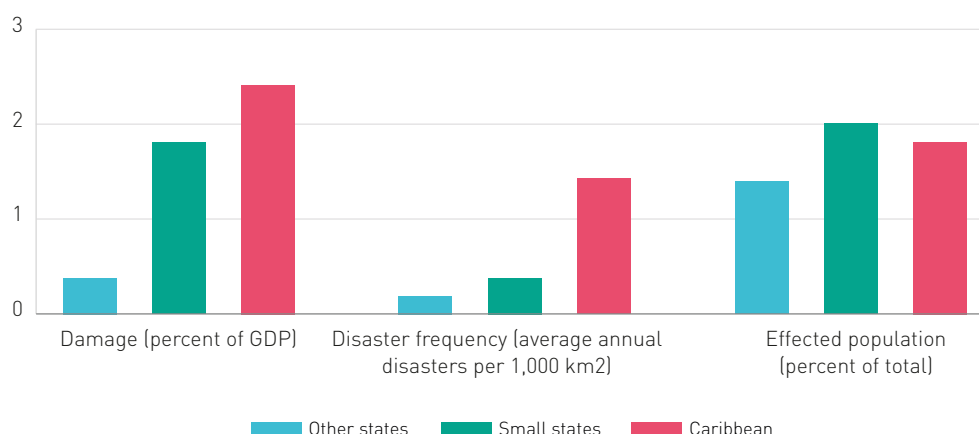
The Caribbean region has been dramatically exposed to natural disasters. Since 1950, 324 natural disasters stroke the Caribbean, killing around 250,000 people and affecting more than 24 million people. The economic impact of natural disasters has been considerable, surpassing \$22 billion in constant 2009 U.S. dollars over the period 1950–2016, compared with \$58 billion globally (including the Caribbean). Though vulnerability to natural disaster is typical of small states, the Caribbean is more exposed. For example, the Caribbean countries annually suffer from disaster damages equivalent to 2.5% of GDP annually (IMF, 2017). In Dominica, costs of the 2015 floods are equivalent to 96% of GDP; in Grenada, the 2004 hurricane cost damages equivalent to 200% of GDP; and the 1998 storms cost over 100% of GDP in St. Kitts and Nevis (IMF, 2017). The average annual damage from disasters for the Caribbean is equivalent to 2.4% of GDP, which is about 0.6% higher than other small states. More frequent and costly catastrophes hinder economic growth, worsening fiscal and external balances, and adversely affect poverty eradication and social welfare.

24 "Building Resilience in Developing Countries Vulnerable to Large Natural Disasters", 2019, International Monetary Fund Policy Paper. Available at: <https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/06/24/Building-Resilience-in-Developing-Countries-Vulnerable-to-Large-Natural-Disasters-47020?cid=em-COM-123-39047>.

25 "Fiscal Challenges in the Caribbean: Coping with Natural Disasters", Inci Ötger and Franz Loyola in "Unleashing growth and strengthening resilience in the Caribbean" edited by Trevor Alleyne, Inci Ötger, Uma Ramakrishnan, and Krishna Srinivasan (2017) International Monetary Fund, 2017 Available at: <https://www.imf.org/en/Publications/Books/Issues/2018/02/26/Unleashing-Growth-and-Strengthening-Resilience-in-the-Caribbean-44910>.



Highly exposed – Natural disasters occur more frequently and cost more on average in the Caribbean than elsewhere – even in comparison to other small states



Source: EM-DAT; IMF.2016. "Small States' Resilience to Natural Disasters and Climate Change – Role for the IMF"; IMF, World Economic Outlook; World Bank, World Development Indicators; and authors' calculations.

Source: IMF (2017), Ötoker and Srinivasan (2018)²⁶

121. Changing exposure to risk has led UNESCAP to conclude that disaster damage impacts in Asia and the Pacific are outpacing the region's economic growth – rising as a proportion of GDP, from around 0.1 per cent in the 1970s to about 0.4 per cent in recent decades. The region's rapid economic growth has increased the exposure of people and assets to natural hazards, thereby increasing disaster risks (UNESCAP 2018). It is also a perspective shared by the Asian Development Bank: "Exposure to disaster risk in developing Asia is rising rapidly. This is partly just a function of population and economic growth, as there are more people and built structures in harm's way, but it is also a function of trends that concentrate population and assets in high-risk locations, such as the spread of coastal mega-cities. Some of these trends are particularly pronounced in developing Asia (ADB 2019).
122. Understanding hazard exposure is often a starting point in determining disaster risks. Even in countries regularly hit by natural disasters or with a high degrees of disaster preparedness, information on hazard exposure may be limited or partial in scope. The Christchurch earthquake of 2011 is a case in point. The violent 6.3-degree earthquake on 22 February 2011 was caused by movement along a fault line that was not previously known to the national geological service. Using measurements taken at scientists were able to determine its location one-kilometre under-ground.²⁷
123. Thanks to enhanced technology and greater data availability, many disasters can be predicted (UNESCAP 2019). The quality and availability
- of seismic maps and earthquake models are improving, for example, as the scientific knowledge of earthquake progresses. Enhanced knowledge about natural disasters can provide valuable input for better understanding and managing earthquake exposure and to support insurability (OECD 2018).²⁸
124. It is nevertheless challenging to ensure that technical information underpins an understanding of hazard exposure and appropriate actions are in place to mitigate risk, particularly where capacity may be limited by resource constraints. A pertinent example is assessing flood risks. There is no single source that causes a flood, which can arise from a wide array of factors. Even in the same catchment area, the same precipitation distributed in different ways can lead to vastly different results. The ability to tailor information, such as a short-term weather forecasts to generate flood risk warnings and preventive action, requires investment in hydrological equipment and its maintenance, well-trained staff, and capability on the part of local government (UNDRR 2019).
125. Natural hazard is also dynamic. A factor exerting an influence on the incidence of hydro-meteorological hazards is climate change, both anthropogenic and natural climate variability. A changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events (IPCC 2012). There remains large uncertainty with regard to local outcomes of climate change, including climate and hydrometeorological events such as heat waves,

²⁶ "Bracing for the Storm: For the Caribbean, building resilience is a matter of survival." Available at: <https://www.imf.org/external/pubs/ft/fandd/2018/03/pdf/otker.pdf>.

²⁷ <https://www.gns.cri.nz/Home/Our-Science/Natural-Hazards-and-Risks/Recent-Events/Canterbury-quake/Hidden-fault>.

²⁸ "Financial Management of Earthquake Risk", 2018, OECD Available at: <https://www.oecd.org/finance/financial-management-of-earthquake-risk.htm>.



heavy precipitation events, drought, and tropical cyclones (IPCC 2012).

126. Climate change and the complexity of disasters is creating deep uncertainty. Disasters are deviating from the usual tracks, making it difficult to apply historical records for their analysis and to respond with adequate disaster management.²⁹ The rapid intensification and uncommon path taken by Cyclone Ockhi that hit Sri Lanka and India in 2017 illustrates how natural disaster can affect areas that had no recent experience of similar weather events.³⁰
127. Box 4 below highlights some of the main conclusions of the 2019 Intergovernmental Panel on Climate Change (IPCC) report on the predicted effects of global warming at 1.5°C and 2.0°C. The 2019 IPCC report points to a likely increase in the burden of extreme temperature events, risks from drought and flooding due to heavy precipitation and sea-

level rise. The effects become more pronounced if global warming reaches 2.0°C.

128. Moreover, one hazard event may lead to the incidence of another unrelated hazard. Examples here include the closure of the Armenia's Medzamor Nuclear Power Plant in 1989 because of the Spitak earthquake and the Fukushima nuclear disaster provoked by the tsunami generated by the Great East Japan Earthquake in 2011. The hazard community has broadened its scope to examine more complex, real scenarios that acknowledge the likelihood of one hazard eventually leading to another (cascading hazard), or multiple hazards crossing in either time and/or space creating an even larger disaster (UNDRR 2019). The 2010 Eyjafjallajökull volcanic eruption in Iceland offers a further example of how which natural hazards may combine with other risks in dynamic and unexpected ways to affect the economy – see Box 5.

Box 4: Extreme events and Global Warming at 1.5°C and 2.0°C

Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C and between 1.5°C and 2°C. These differences include increases in: mean temperature in most land and ocean regions (high confidence), hot extremes in most inhabited regions (high confidence), heavy precipitation in several regions (medium confidence), and the probability of drought and precipitation deficits in some regions (medium confidence)

Temperature extremes on land are projected to warm more than GMST (high confidence): extreme hot days in mid-latitudes warm by up to about 3°C at global warming of 1.5°C and about 4°C at 2°C, and extreme cold nights in high latitudes warm by up to about 4.5°C at 1.5°C and about 6°C at 2°C (high confidence). The number of hot days is projected to increase in most land regions, with highest increases in the tropics (high confidence).

Risks from droughts and precipitation deficits are projected to be higher at 2°C compared to 1.5°C of global warming in some regions (medium confidence). Risks from heavy precipitation events are projected to be higher at 2°C compared to 1.5°C of global warming in several northern hemisphere high-latitude and/or high-elevation regions, eastern Asia and eastern North America (medium confidence).

Heavy precipitation associated with tropical cyclones is projected to be higher at 2°C compared to 1.5°C global warming (medium confidence). There is generally low confidence in projected changes in heavy precipitation at 2°C compared to 1.5°C in other regions. Heavy precipitation when aggregated at global scale is projected to be higher at 2°C than at 1.5°C of global warming (medium confidence). As a consequence of heavy precipitation, the fraction of the global land area affected by flood hazards is projected to be larger at 2°C compared to 1.5°C of global warming (medium confidence). Model-based projections of global mean sea level rise (relative to 1986–2005) suggest an indicative range of 0.26 to 0.77 m by 2100 for 1.5°C of global warming, 0.1 m (0.04–0.16 m) less than for a global warming of 2°C (medium confidence).

Source: Intergovernmental Panel on Climate Change 2019

29 The Disaster Riskscape Across Asia-Pacific The Disaster Riskscape Across Asia-Pacific: Pathways for resilience, inclusion and empowerment Asia-Pacific Disaster Report 2019 Pathways for resilience, inclusion and empowerment, UNESCAP 2019 Available at: <https://www.unescap.org/publications/asia-pacific-disaster-report-2019>.

30 "Why scientists are baffled about cyclone Ockhi", 10 February 2018, Shreeshan Venkatesh, Down to Earth Available at: <https://www.downtoearth.org.in/news/natural-disasters/why-scientists-are-baffled-about-cyclone-ockhi-59658>.



Box 5: Volcanic Ash and the Risk to Aircraft Engines

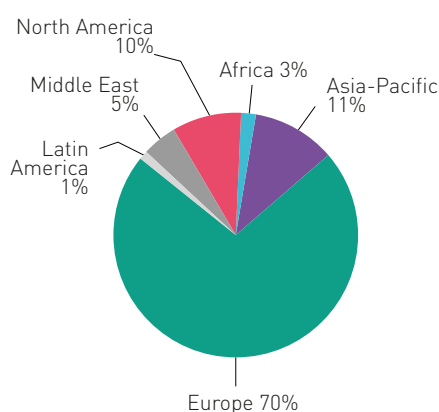
Ten million passengers affected and USD 1.7 billion in airline losses; these are IATA's "conservative" estimates of the direct economic impact of the 2010 Eyjafjallajökull volcanic eruption in Iceland. As ash started to spread through European air space, so passenger and cargo operations were disrupted due to the risk of aircraft engine damage. At the height of the ash plume between 15-21 April, just under 30% of worldwide scheduled passenger capacity was grounded and fully 75% of European airline industry capacity too. Airline losses ran at USD 400 million per day, with 100,000 flights cancelled and the business and tourism journeys of 1.2 million passengers disrupted.

Nor were losses limited to European carriers. North American and Asian-Pacific connections accounted for 20% of grounded capacity. The flights disruptions also had a disproportionate impact on some regions. Such is the importance of European connections for African airlines that although these routes represented only 3% of total grounded capacity, this figure corresponded to fully 30% of these airlines' total available seat kilometres (ASK) capacity.

To reopen airspace, European aviation authorities worked on new concentration charts to delineate hazard zones based on ash concentration. 'Low' ash concentration charts were used by air traffic management and airlines to define zones of low-density ash that they could be safely transited by planes with no or minimal risk of aircraft damage. These dispersion models were accompanied by a regime of enhanced risk assessment and more frequent aircraft inspections.

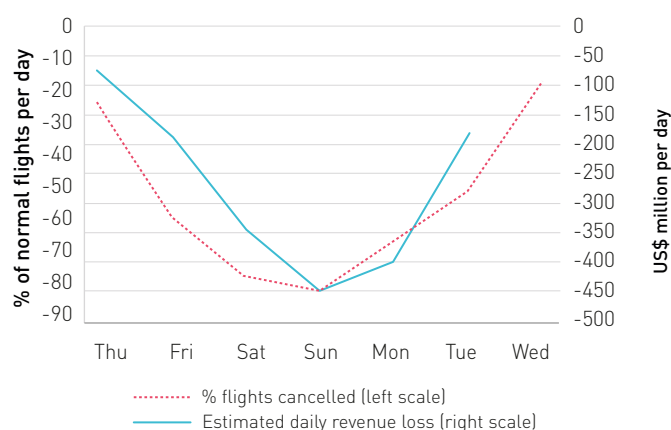
Source: IATA³¹ and US Geological Survey³²

Figure 6: Airlines share of affected ASK



Source: Emergency Events Database (EM-DAT)

Figure 7: Impact on airline revenues per day



Source: Emergency Events Database (EM-DAT)

129. Analysis of WTO Trade Policy Reviews further underscores how a natural hazard may combine with other challenges, particularly when the disaster concerned is a slow onset event.³³ An example is the Eastern African region drought of 2011. The drought reduced crop output in Djibouti and caused food price inflation. The situation was worsened by other factors such as influx of migrants and rising fuel prices.³⁴

130. Research by UNESCAP identifies four "disaster risk hotspots" in the Asia and the Pacific region where fragile environments converge with critical socioeconomic vulnerabilities. These hotspots combine the presence of hazards with high exposure due to low-income populations, economic dependence on a narrow range of economic activities and critical infrastructure vulnerability, in the form of energy generation,

31 "The Impact of Eyjafjallajökull's Volcanic Ash Plume", May 2010 IATA Economic Briefing, Available at: <https://www.iata.org/whatwedo/Documents/economics/Volcanic-Ash-Plume-May2010.pdf>.

32 Volcanic Ash Impacts & Mitigation, Aviation, US Geological Survey website, 10 February 2016, https://volcanoes.usgs.gov/volcanic_ash/ash_clouds_air_routes_eyjafjallajokull.html.

33 A slow-onset disaster is defined as one that emerges gradually over time. United Nations Office for Disaster Risk Reduction (UNDRR) 2 February 2017.

34 Trade Policy Review of Djibouti, Report by the Secretariat, WT/TPR/S/305.



transport and ICT infrastructure. The combination of different risk factors makes it much more likely that disasters will transmit poverty, marginalization

and disempowerment across generations. These hotspots, the hazards affecting them and their vulnerabilities are highlighted in Figure 8 below.

Figure 8: Disaster risks hotspots in the Asian Pacific region

HOTSPOT 1		TRANSBOUNDARY RIVER BASINS	
Flood and drought prone areas, South and South-East Asia			
Population exposure		Very high (mostly poor)	
Economic stock exposure		High	
Infrastructure: energy		Low	
Infrastructure: transport		Moderate	
Infrastructure: ICT		Low	

HOTSPOT 2		RING OF FIRE	
Earthquake, landslide and tsunami, typhon tracks, North and East Asia, South-East Asia			
Population exposure		High (disproportionate impact on poor)	
Economic stock exposure		Very high	
Infrastructure: energy		Very high	
Infrastructure: transport		High	
Infrastructure: ICT		Moderate	

HOTSPOT 3		PACIFIC SMALL ISLAND DEVELOPING STATES	
Tropical cyclone, El Niño, earthquake and landslide			
Population exposure		Very high (mostly poor)	
Economic stock exposure		High	
Infrastructure: energy		High	
Infrastructure: transport		Moderate	
Infrastructure: ICT		Low	

HOTSPOT 4		SAND AND DUST STORM RISK CORRIDORS	
Sand and dust storms drought and floods, South Asia, South-West and Central Asia			
Population exposure		High (mostly poor)	
Economic stock exposure		High	
Infrastructure: energy		Moderate	
Infrastructure: transport		Moderate	
Infrastructure: ICT		Low	

Very high	Approximately over 75 per cent are exposed to hazards
High	Approximately 51-75 per cent are exposed to hazards

Moderate	Approximately 25-50 per cent are exposed to hazards
Low	Approximately less than 25 per cent are exposed to hazards

Source: UNESCAP (2019)³⁵

131. A factor that can geographically extend the exposure to natural disasters is participation in global production networks and supply chains. With the globalization of supply chains, production is spread across-borders, so is the exposure of firms to risks of disasters. A natural disaster in one geographical location can affect firms in other locations. Some studies find, for example, the 2011 East Japan earthquake had led to a drop-in automobile production of 19.7 per cent in Thailand, 24 per cent in the Philippines, and 6.1 per cent in Indonesia (Ye and Abe, 2012).

132. Some widely used supply chain management strategies allow firms to optimise the cost structure of product, but also increase the risks of problems in situations of natural disasters. Examples include the “just-in-time” practice and lean supply chain management, which require more frequent deliveries of supplies, minimizing the non-value-added time and inventory. These efficiency maximization models in business increase the level of interdependence between firms and correspondingly raise the chances of a supply chain disruption.³⁶

35 The Disaster Riskscape Across Asia-Pacific The Disaster Riskscape Across Asia-Pacific: Pathways for resilience, inclusion and empowerment Asia-Pacific Disaster Report 2019 Pathways for resilience, inclusion and empowerment, UNESCAP 2019 Available at: <https://www.unescap.org/publications/asia-pacific-disaster-report-2019>.

36 “The impacts of natural disasters on global supply chains”, 2012, Linghe Ye and Masato Abe, ARTNeT Working Paper no. 115, June, Bangkok, ESCAP. Available at www.artnetontrade.org.

133. An important distinction to make about this form of exposure is that economic linkage, rather than direct physical exposure to the damage to property and productive capacity, transmits the natural disasters shock. As such, natural hazards affecting supply chain suppliers are part of a range of business risks that companies engaged in global supply chains must manage. The trade effects arising from exposure through participation in supply chains are discussed in more detail in the next section.
134. UNCTAD highlights the exposure of transport infrastructure to hydro-meteorological related hazards. Dependence on air and maritime transport makes many countries in the UN category of Small Island Developing States vulnerable to economic disruption if transport routes are disrupted or infrastructure damaged. Such hazards include heavy precipitation and flooding, storm surges, wind, extreme heat and sea-level rise. The passage of Hurricane Matthew over Haiti in 2016 is a case in point. It temporarily closed transport links and damaged 11 port facilities at an estimated replacement cost of USD26.2 million. It also severely damaged road infrastructure at a replacement cost of USD208 million. Damage to transport infrastructure slowed and complicated the import and distribution of food aid to 1.4 million people left in need by the storm and acted as a brake on export recovery.
135. As pointed out by the 2019 World Trade Report, the transportation sector is already experiencing weather-related services disruptions, but with increases in temperature and precipitations, the rise of sea levels and extreme climactic events, the frequency of damage to transportation infrastructures, including roads, airports and ports, will increase (Dellink et al., 2017; IPCC, 2014). Maritime shipping may experience more frequent port closures. Similarly, land-based transportation, including trucks and trains, and air transport may be impacted by climate change, through faster degradation of road and bridge infrastructure and impairment of the operation of airports (Dellink et al., 2017). This damage to transport infrastructure will result in an increase in maintenance, operation, rehabilitation and repair costs, as well as accelerated infrastructure replacement costs (WTO, 2019).
136. In addition to the burden of extreme events, normal port operations may be slowed or halted because of a range of hydro-meteorological hazards. Increases in the frequency of heavy downpours can cause flooding of critical road, port, and airport facilities and can deposit debris on roads, blocking access for employees or travellers. Heat events can cause asphalt to soften and rut, cause rail lines to buckle, and affect air operations by reducing payloads and limiting the potential for large plane landings and take-offs. Increased precipitation can cause long-term effects on the structural integrity of roads, bridges, drainage systems and telecommunication systems, necessitating more frequent maintenance and repairs (UNCTAD 2017).

Economic and trade effects of natural disasters

Overview

137. A growing body of literature on disasters, trade and economic growth highlights how natural disasters impact the growth prospects of developing countries. The literature is reviewed in this section using various sources: reports published by international organizations, academic studies, Trade Policy Reviews (TPRs), and a sample of 15 Post-Disaster Needs Assessments (PDNAs).
138. A first section examines the impact of natural disasters on economic output and growth. Another part then discusses impacts on trade performance. A further segment then examines how disaster shocks are transmitted through supply chain networks. A final section examines the measures reported in Members' Trade Policy Reviews over the period 2010-2019 taken in relation to disaster response, recovery and resilience.
139. Some studies find severe short-term contractions in economic output and discernible, lasting impacts on GDP growth of natural disasters. Other research points to these effects as being short-lived, localized and outweighed by the stimulus impact of reconstruction. Empirical evidence of the effects of disasters on growth is strongest in relation to small economies.
140. Part of the difficulty in drawing firm conclusions on the macro-economic impacts is the context-specific nature of disasters, the differential size and impacts of different hazards (e.g. sudden onset disasters, such as earthquakes, and slow-onset disasters e.g. droughts) and the dissimilar vulnerability of disaster-affected states to the same hazard.
141. One factor masking the impact of natural disasters is that many disaster-affected states continue to register positive economic growth, either in the year of a disaster or subsequent years. **ANNEX 2** examines data on macro-economic impacts reported in a cross-section of 15 Post-Disaster Needs Assessments (PDNAs). It highlights that in 11 of the 15 cases examined economic growth rates contracted, but remained positive. This point also emerges in Trade Policy Reviews (analysed for the period 2010-September 2019 in **ANNEX 1**).
142. As highlighted in the previous section, although natural disasters may bring negative impacts to the local economy, large countries may be more diversified and capable of engineering the inter-sectoral and inter-regional transfers required to mitigate the economic impact of natural disasters or even register positive economic growth. In some cases, efforts to reconstruct after a natural disaster may boost economic growth.



143. The TPRs of Sri Lanka and the Solomon Islands are illustrative of how economic growth may continue in spite of natural disasters. The 2010 Trade Policy Review (TPR) of Sri Lanka highlighted that the economy had demonstrated “remarkable resilience”, expanding at an annual average of 6% between 2004 and 2009 despite internal conflict, the 2004 tsunami, and the global economic recession. The Solomon Islands’ 2016 TPR similarly illustrated how the economy had grown by 3.2% despite the impact of a magnitude 8.0 on the Richter scale earthquake and tsunami in 2013, an El Niño linked drought phenomenon and the impact of Tropical Cyclone Raquel in April 2014 that caused damage equivalent to 9.2% of GDP. In both cases, natural disasters slowed, but did not stop, expansion of the economy.
144. Lower, but still positive, GDP growth however masks differential impacts within an economy. The 2019 TPR of Papua New Guinea (PNG) is a case in point. The country has several active volcanoes, and is subject to frequent earthquakes, including a large one in February 2018. The earthquake took the lives of nearly 200 people, damaged infrastructure, and disrupted oil, gas, and minerals exports. The PNG authorities expected real GDP growth in 2018 to drop to 0.3%, pushed downwards by the impact of the earthquake, a major drought in 2017, and low commodity prices. Impacts of the earthquake and drought fell disproportionately heavily on the 3 million people, about 40% of PNG’s population, who live below the basic needs’ poverty line – many falling back into poverty in the aftermath of the catastrophic earthquake.
145. A 2017 World Bank report highlights how a flood or earthquake can be disastrous for the poor, but have a negligible impact on a country’s aggregate wealth or production. The same loss affects poor and marginalized people far more because their livelihoods depend on fewer assets, their consumption is closer to subsistence levels, they cannot rely on savings to smooth the impacts, their health and education are at greater risk, and they may need more time to recover and reconstruct (World Bank, 2017.³⁷ The World Bank report further estimates that extreme weather events push some 26 million people into poverty every year.
146. Among the vulnerable population, women often disproportionately bear the burden of natural disasters. Studies find that natural disasters on average kills more women than men and thus lower the life expectancy of women more than that of men (Neumayer and Plümpner, 2007) and Women may be denied adequate relief aid or compensation for their losses or may be marginalised in rebuilding and reconstruction efforts (Enarson, 2000).
147. Disasters disrupt businesses through a variety of channels in addition to the direct physical damage to buildings, equipment, and inventory. The loss of business documents, including electronically stored documents, and delays in restoring essential services such as electricity can further lengthen interruptions to normal commercial operations. Losses to natural disasters can also be amplified by lack of access to emergency funds or additional finance through official lending institutions. Limited or no insurance coverage and slow pay-outs can add to financial distress, including among other firms with which MSMEs do business.
148. Issues of access by MSMEs to working capital and debt emerged strongly in the country research. For example, Hurricane Maria hit Dominica at a time when MSMEs were preparing for a new tourism season, incurring debt for investment in property upgrades and visitor hospitality. A key issue that emerged for businesses as they sought to recover from the hurricane damage was the ability to refinance existing debt, before assuming additional financial commitments – assuming of course that they were able to access financing.
149. Another strand to the recent research literature examines the cumulative effects of recurrent natural disasters on the same economy. Box 6 discusses the impact of repeated tropical cyclones on economic output in the Philippines. Separate work published by the World Bank (2017) estimated that Typhoon Haiyan in 2013 pushed an estimated one million Filipinos back into poverty, destroyed over a million homes and sapped USD 12.9 billion from the national economy.
150. Nor is the Philippines alone in being exposed to recurrent hazards. Asian Development Bank research on the Fijian economy highlights the volatility it has faced as a result of a series of external and internal shocks over the past 40 years. These include *inter alia* a series of natural disasters (cyclones in 1985, 1992, 1993, 2009, 2010 and 2012); the Asian financial crisis (1997); spikes in food and fuel prices (2008); the global economic crisis (2009 and 2010); and, most recently, severe flooding in the western and northern divisions of the country (January 2012 and late March 2012) followed by tropical cyclone Evan (December 2012).³⁸

37 “Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters”. Climate Change and Development Series. (2017) Hallegatte, Stephane, Adrien Vogt-Schilb, Mook Bangalore, and Julie Rozenberg.. Washington, DC: World Bank Available at: <https://www.worldbank.org/en/news/feature/2016/11/14/breaking-the-link-between-extreme-weather-and-extreme-poverty>.

38 “Fiji 2012: Revitalizing the Fiji economy”, (2012) Asian Development Bank, 2012 Available at: <https://www.adb.org/sites/default/files/publication/30184/fiji-2012-revitalizing-economy.pdf>.



Table 5: How businesses are affected by disasters

MACROECONOMIC	Direct Losses	Complete/partial destruction of immovable assets and stock (including damage to factories office equipment, final goods, goods in process, raw materials, materials and spare parts)	Stock
	Indirect Losses	Incurred due to business interruption, as a consequence of direct losses or due to impacts on a business' supply chain, potentially impacting other clients and suppliers. As a result, business output and revenue falls, affecting profitability.	Flows
	Wider impacts	Refers to other consequences such as loss of market share, competitors taking clients, labour shortages, severed relationships with suppliers, costlier or constrained insurance, and negative impacts on business image and reputation.	
	Macro-economic impacts	Arise through all the above losses and impacts and can in turn negatively affect business performance, reflecting the manner in which disasters impact on the economy of a country.	

Source: UNDRR 2013

Box 6: The local economic impacts of tropical cyclones in the Philippines

Exposure to tropical cyclones significantly disrupts economic activity in the Philippines. Asian Development Bank research found that after a storm of average intensity in the sample of typhoons having made landfall since 1970, local economic activity was reduced by 2%. After the most severe storm in the sample, local economic activity was reduced by 23%. On average, these effects on local economic activity appeared not to persist beyond the year of the storm.

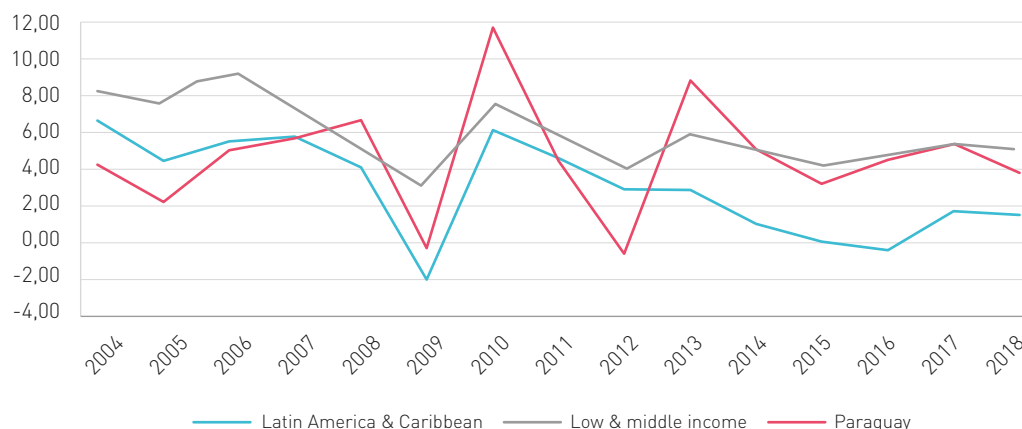
Relatively frequent storms, those with a 5-year return period, should be expected to produce losses equal to about 1% of national economic activity. This figure rises though as one considers less frequent events. For example, a storm with a 50-year return period is expected to cause a reduction of national economic activity exceeding 2% in the year of the storm.

Source: ADB 2019

151. The experience of Fiji highlights a central research issue for economists, i.e. how to separate out the impact of a natural disaster from other events that may also buffet a disaster-affected economy. The experience of multiple shocks emerges strongly in many of the TPRs reviewed. For example, Jamaica's 2010 TPR highlighted how it was contending not just with the lingering impacts of Hurricanes Ivan (2004), Dennis (2005), Emily (2007) and Dean (2008), but also the impact of the global economic crisis. The 2014 TPR of the East African Community highlighted that several Members were coping with the inflationary impact on food prices of severe drought, as well as the migration of affected populations within, and between, East African countries between 2011/12.³⁹
152. Exposure to a specific hazard may also produce very specific economic and trade challenges. Paraguay's 2017 TPR is a case in point. Like other Latin American countries and other low-and middle-income countries, Paraguay's GDP growth contracted as a result of the economic crisis in 2008. In addition to this economic downturn though, Paraguay was hit by drought conditions in 2011-12. The drought caused a severe contraction in economic output – one comparable in size to that of the global economic crisis. The end of the drought conditions saw a rapid recovery in soya beans, beef and cereal production (which together account for 60% of Paraguay's exports) and a return to strong growth. As a result, Paraguay's GDP growth over the decade 2005-15 has demonstrated considerable volatility (see Figure 9).
153. The long-run impact of a disaster on any country will depend on the economic, social and institutional conditions – and the subsequent response. A case cited by the Asian Development Bank is the response to the May 2008 earthquake in Sichuan, China. The earthquake inflicted terrible damage to infrastructure, residential and commercial property and took the lives of more than 80,000 people. Rebuilding has equipped the region with new infrastructure helping the Sichuan economy re-establish its productivity. Income per capita has doubled, and Sichuan now ranks number one among provinces in Western China (ADB, 2019).
154. Fiscal space, institutional capacity, and ex-ante preparedness can help mitigate the cost of natural disasters. Countries with fiscal space – be it financial buffers, lower debt levels, and/or significant insurance coverage – can move quickly to finance

39 The TPR of Uganda also references the impact of the eruption of the Eyjafjallajökull volcano in 2010 and its impact on Uganda's coffee exports.



Figure 9: The impact of the global economic crisis and drought on Paraguay's GDP growth (2005-2018)

Source: World Bank Databank

reconstruction. One policy measure noted in the TPR of the Philippines is the maintenance of a high level of international reserves (USD 80.7 billion in 2016), enough to cover almost nine months of imports – a measure justified by the country's vulnerability to natural disasters and capital flow volatility.

155. Although governments may resort to fiscal stimulus during economic difficulties, such deficit spending is not available to all countries coping with an adverse economic shock of a natural disaster. As the Inter-American Development Bank highlights, governments of small, poor countries, who are often already in debt, lack the “fiscal space” to play the stimulus card. Foreign investors might be unwilling to lend, at least at affordable interest rates – especially when a major disaster has put the country's economic future in doubt (IADB, 2010).⁴⁰ Various of the TPRs examined for this study highlight existing fiscal pressures on the Members reviewed arising for a variety of reasons.

156. A further complication for many disaster-affected Members is that a fall in output is likely to reduce revenue from taxes and duties. The ADB highlights that a rise in imports of emergency-related goods may not generate much revenue, as most of these tend to be exempt from duty. (ADB, 2019) The net effect on the budget will depend on the circumstances, but generally the budget effect of natural disasters is likely to be lower in developed economies – which have stronger financial sectors and extensive disaster insurance such that a larger chunk of the output loss will be absorbed by the private sector and the fiscal impact is lower. In most developing countries, on the other hand, the brunt of the responsibility for rehabilitation and reconstruction falls on the government which can see its budget deficit increase (ADB, 2019).

Impacts on economic output

157. A 2019 report by the Asian Development Bank outlines the economic and trade effects of natural disasters. From the macroeconomic perspective, a natural disaster generates economic destruction, causing initial direct loss to assets and capital as well as long-term effects. The negative impact on the output delivers a shock to the aggregate supply curve, resulting in a decline in real output and employment (ADB, 2019).

158. Natural disasters lead to an immediate, short-term contraction in economic output. One survey studied 35 events for which median damage was 3 per cent of GDP and found that in 28 out of the 35 cases, GDP growth fell in that year, with a median reduction of 1.7 percentage points. Another study looking at 21 major disasters found that same-year GDP growth fell by an average of 3.1 percentage points. Other studies estimated that disasters produce an average 0.7 percentage-point drop in GDP growth in the first year (ADB, 2019).

159. While most disaster impacts on economic activity appear to be short-lived, in some cases the effects may persist for a long time. For example, a decade on from the 1995 Kobe earthquake in Japan, local income per capita in Hyogo Prefecture was still depressed because of lost employment opportunities. This reflected a regional shift from manufacturing to services that was directly attributable to the earthquake. A significant share of heavily damaged factories failed to resume operations in Kobe, and there was a shift in employment from Kobe to nearby Osaka. As a result, the earthquake caused a permanent loss of economic opportunity (DuPont et al. 2015, Cole et al. 2018).

40 “Ideas for Development in the Americas”, 2010, Inter-American Development Bank Research Department Vol 22 May-Aug 2010. Available at: https://issuu.com/idb_publications/docs/_en_80000/16.

160. There is also evidence that poor countries can experience prolonged, slow, and incomplete recovery in the aftermath of severe disasters. In particular, small island states are vulnerable because of their size relative to the hazards' footprint, their geographic isolation, and their lack of economic diversity. These factors mean not only higher aggregate damage but less hope of recovery in the short or long term. The 2010 earthquake in Haiti, for example, was so catastrophic that it was found to have undermined the long-term development prospects of the Haitian economy (Best and Burke, 2017).
161. In the economic literature, Noy (2009) finds that natural disasters have an adverse impact on the macro-economy in the short-run and costlier events lead to more pronounced slowdowns in production. Developing countries and smaller economies face much larger output declines following a disaster of similar relative magnitude than do developed countries or bigger economies. In addition, countries with a higher literacy rate, better institutions, higher per capita income, higher degree of openness to trade, and higher levels of government spending are better able to withstand the initial disaster shock and prevent further spill/overs into the macro/economy.
162. Raddatz (2007) attempts to estimate the effect of external shocks on short-run output dynamics in developing countries. He analyses the contribution of various external/exogenous shocks, natural disasters among them, in explaining output fluctuations, and finds that climatic and humanitarian events reduce real per capita GDP by about 2% and 4% respectively. Hochrainer (2009) construct counterfactuals for up to 5 years after the disaster event to assess how the economy would have performed if the disasters had not occurred. He finds that natural disasters on average lead to negative consequences, although the effects are significant only in the case of large shocks. Furthermore, the study finds that greater aid and inflows of remittances reduce adverse macroeconomic consequences, and that direct losses appear most critical.
163. The more recent economic literature typically utilizes more robust econometric techniques. Felbermayr and Gröschl (2013) use an alternative dataset of natural disasters based on physical measures of disaster intensity. The results reveal a substantial negative and robust average impact effect of disasters on growth. The top 1-per cent most severe natural disasters can reduce GDP per capita by at least 6.83%, while the top 5-percentile disasters cause per capita income to drop at least by 0.33%. Moreover, the authors show that better institutional quality, higher openness to trade, and higher financial openness help spur the economic reconstruction process so that the adverse effect of a natural disaster on per capita income is reduced.
164. A few other economic studies examine the impact of natural disasters on poverty, human development and consumption. Rodriguez-Oreggia et al (2013), for example, show a significant increase in poverty by 1.5–3.6% points and a decline in the Human Development Index in disaster-affected municipalities in Mexico. Mechler (2009) finds a small decrease in household consumption for low-income countries hit by disasters.
165. The literature on the long-run effects of natural disasters is growing, with more recent studies finding that disasters have no long-run effects on per capita GDP, unless the disaster triggers other institutional changes/ regime change.
166. Overall, the economic evidence points to short-term economic output contraction following a natural disaster, highlighting the impact of natural disasters on countries' economic performance particularly in situations where the fiscal space is unavailable to engage in fiscal stimulus or funds are insufficient to achieve reconstruction. Several studies underline that countries with better institutional quality and more openness to trade are more prepared to withstand the impact of natural disasters.

Impacts on trade performance

167. Natural disasters and trade interact in complex, and often unexpected ways, as well as in different dimensions, including at a macro or economy-wide level in disaster-affected countries, and at a sectoral, product or firm level. One important function that trade performs is that of a "shock-absorber" for natural disasters. Put simply, trade allows supply shortages shocks in one location to be covered by imports from other unaffected places.
168. Imports play a critical role in recovery and reconstruction. Typically, natural disasters can bring a rise in import bills for food, raw materials and reconstruction materials. Exports, however, tend to decline due to the destruction of productive capacity and market infrastructure or the reallocation of labour to disaster relief and rehabilitation. Natural disasters can exert different impacts on various sectors of the economy. The primary impact of natural disasters is often felt in the agriculture sector for countries with a high concentration of agricultural exports, and the trade in industrial goods and services may also be impacted by natural disasters.
169. Agricultural sectors are affected differently by alternative types of hazards (FAO, 2018). Hurricanes, typhoons and cyclones are likely to cause loss of plant cover and crop damage, and erosions to root and tuber crops. From 2006 to 2016, almost two-thirds of all damage and loss to crops was caused by floods. In absolute terms, the most harmful disaster for crops was the 2010 flood in Pakistan (USD 4.5 billion), followed by the 2008–2011 drought in Kenya (USD 1.5 billion). Drought remains by far the most harmful disaster for livestock, causing 86 percent of total damage



and loss in the sector. The largest impact over the past decade is attributed to the 2008–2011 drought in Kenya (USD 8.9 billion) and in the overall Horn of Africa region (FAO, 2018).

170. The negative impact of natural disasters on agricultural exports also finds empirical support in some Members' TPRs. Jamaica's 2010 TPR highlighted how, in the face of an increase in the frequency of natural disasters (five storms in four years), the Jamaica Producers Group, responsible for over 80% of total exports, decided to suspend exports to Europe, citing the high cost of resuscitation as the reason. Jamaica's 2017 TPR further underscored the role of natural disasters in depressing agricultural production and exports, notably drought and the lingering effects of hurricane Sandy in 2012 that led to reductions in the sector's production and export earnings. The 2014 TPR of Saint Lucia also highlighted the impact of Hurricane Thomas on banana plantations on the island in November 2010, causing a significant setback in agriculture production and exports.
171. A further case cited in the TPRs of the impact of storm damage on agriculture exports is Grenada's 2012 TPR. Prior to the passage of Hurricanes Ivan and Emily in 2004, Grenada had been the world's second largest producer of nutmeg. Nutmeg production was a major contributor to GDP and foreign exchange earnings and employment. In 2002, nutmeg's revenue averaged EC\$ 35 million (approx. 13 billion USD) in 2000–2004 and contributed 22.5% of Grenada's total merchandise export in 2002. The hurricanes caused the destruction of 90% of Grenada's nutmeg trees.⁴¹ By the time of the 2012 TPR, production had recovered to only 30% of pre-Hurricane levels.
172. Droughts leading to drying and cracking of the earth and loss of plant layer can result in infertile land and loss in agricultural production (FAO, 2018). The TPRs of Burkina Faso, Kenya, Namibia, Niger, Senegal all highlight this effect. In Namibia, the livestock sector and exports suffered due to a protracted drought in 2013 which led to a significant increase in livestock marketed. Similarly, agricultural output fell due to a decline in crop production fuelled by drought conditions. Given its arid climate, the TPR highlights that Namibia's agricultural output is highly vulnerable to climatic factors. The TPRs of Dominica, Honduras and Tonga highlight how drought can act in combination with storms to cause difficulties for the agriculture sector. The TPRs of Belize and Togo also reference damaging impact of floods on the sector.
173. Studies find that an important indicator of the deterioration in the trade balance was a country's dependence on agricultural exports (Benson and Clay, 2001).⁴² Examination of PDNAs highlights the negative impacts on agriculture and the knock-on impact on trade. Slow agricultural recovery adversely affects people's livelihoods and economic activities in the manufacturing and trade sectors. Interruption of transportation services can also affect the sector since farmers cannot transport agricultural products to markets or ports for exports – a situation that affected the agricultural sector in Saint Vincent and the Grenadines after the flood in 2013.
174. Research by UNESCAP suggests the agriculture sector in the Asia-Pacific region absorbed 17% of the total economic impact caused by natural hazards. Given the sector's links with industry and services, the reduced agricultural output slows overall economic growth, leading to a deterioration of a country's balance of payments and increased borrowing. Disaster damage to agricultural assets and infrastructure causes substantial disruptions in production cycles, trade flows, as well as in and livelihoods and employment opportunities.⁴³
175. A comparative analysis across sectors of 74 PDNAs conducted in 53 developing countries over the decade between 2006–2016 shows that the share of damage reported for fisheries, aquaculture and forestry is approximately 7% (FAO, 2018). Two-thirds of disaster impact on fisheries and aquaculture falls under production loss. Such loss is caused mostly by the disruption of fishing and aquaculture farming activities due to damage to key assets such as boats, ponds, fishing gear and hatchery farms, among others.
176. Recovery of agricultural exports may require more than just the re-establishment of production. Box 7 below discusses the experience of Samoa in relation to taro exports in the aftermath of the passage of Tropical Cyclone Val in 1993.
177. In addition to the impact on agricultural production and exports, natural disasters can also severely affect trade in goods. During the response and recovery phases following a natural disaster, import of essential goods, such as food and medicines, emergency relief items, power generators and construction materials, increase, frequently with an initial import surge in the immediate post-disaster phase. Additionally, during the recovery and reconstruction phase, import of construction materials, equipment, and machinery for reconstruction activities increase. An increase of imports in these essential goods were reported in PDNAs after Tropical Cyclone Winston in Fiji in 2016, the 2015 Haiti earthquake, Samoa's Tropical Cyclone Evan in 2012, and Tropical Cyclone Pam in Vanuatu in 2015.

41 "Grenada Nutmeg Sector Development Strategy 2010–2015", July 2010, European Union All ACP Commodities Programme Caribbean Region and International Trade Centre.

42 Dominica : natural disasters and economic development in a small island state (English) Available at: <http://documents.worldbank.org/curated/en/875391468770118094/Dominica-natural-disasters-and-economic-development-in-a-small-island-state>.

43 "Leave No One Behind: Disaster Resilience for Sustainable Development Asia-Pacific Disaster Report 2017" 2018, UNESCAP Available at: <https://www.unescap.org/publications/asia-pacific-disaster-report-2017-leave-no-one-behind>.



Box 7: Natural Disasters and SPS risks – the case of Taro

Tropical Cyclone Val hit American Samoa and Samoa on 7 December 1993. Movement of planting materials infected with taro leaf blight (TLB) fungus (*Phytophthora Colocasiae*) as part of cyclone recovery efforts appeared to have been a factor encouraging the rapid spread of the plant disease. *Phytophthora colocasiae* spores are spread by wind-driven rain from plant to plant, and from plantation to plantation. TLB is also easily spread over long distances through the circulation of infected planting material.⁴⁴

Before 1993, the taro export industry in Samoa was a success story. The industry had developed impressively from the late 1960s targeting expatriate Polynesian populations in specific Pacific rim markets.⁴⁵ In 1993, taro exports to New Zealand from Samoa were 6,300 tonnes, worth WST9.5 million or 60% of Samoa's merchandise exports.⁴⁶

Production in Samoa came to a virtual standstill as the TLB infection spread through the dissemination of infected planting material. TLB control efforts based on cultural and chemical disease management strategies failed. By 1994 supplies of taro on the local market were only one per cent of the 1993 volume (WST11 million) and exports had collapsed.

Taro is a crop that does not fall under the mandate of centres within the Consultative Group on International Agricultural Research system. It suffered from a deficit of research data on genetic diversity, pests and disease diagnostics. Efforts to control TLB needed first to focus on basic research, and the development of disease-resistant varieties. These efforts began with a five-year regional project 'Taro Genetic Resources: Conservation and Utilization', funded by AusAID, that collected Pacific taro and supported a breeding programme in Samoa.

Seven cycles of breeding and evaluation were undertaken in the period 1996–2009.⁴⁷ Exotic taro cultivars from the Asia-Pacific region were crossed with locally adapted varieties to produce new varieties. From twenty-five varieties selected for evaluation, five varieties were ultimately chosen and approved by the Samoa Ministry of Agriculture and Fisheries for export.⁴⁸ During the second half of 2010 a number of trial consignments of approved variety taro were exported to New Zealand. In total, Samoa exported 56 tonnes of taro to New Zealand, indicating a return to commercial taro exports.

A study prepared by AusAID indicates that a major impediment to re-establishing trade is a consumer reluctance to purchase the newly developed TLB-disease resistant export varieties of taro. Competition in both the New Zealand and Australian markets is also strong from other suppliers using varieties that are better accepted by consumers.⁴⁹ Fiji is the main supplier to New Zealand, providing around 90% of taro imports.⁵⁰

A further complication to re-establishing previous export markets is satisfying quarantine market access regulations. The continued presence of TLB means that Samoa must ensure that measures to manage TLB are accepted by regional trade partners.⁵¹

178. Analysis of a sub-set of 15 PDNAs undertaken for this report highlights that one reason that exports tend to decline is the direct damage to export-oriented firms. For example, in Nepal after the earthquake in 2015, exported-oriented industries, such as woollen carpets, handicrafts, and pashmina, were damaged, resulting in the decline of exports (National Planning Commission, 2015b). A further reason for a fall in exports, as identified in PDNAs, is an increase in domestic consumption of goods that would otherwise normally have been

exported. After the earthquake in Nepal in 2015, corrugated galvanized iron sheets and galvanized iron pipes were mostly diverted for domestic production (National Planning Commission, 2015b).

179. Disasters can also have negative impacts on the production and trade in a wide array of services sectors. Damage and losses to the electricity sector, for example, can have a ripple effect through the economy. How quickly power can be restored

44 "Taro Leaf Blight Manual", 2013 Mary Taylor and Tolo Iosefa, Secretariat of the Pacific Community.

45 "The causes and consequences of taro leaf blight in Samoa and the implications for trade patterns in taro in the South Pacific region", 1998, Chan, E. and Milne, M., Fleming, E. Available at: <http://agris.fao.org/agris-search/search.do?recordID=TT2000000111>.

46 'Assessing the social and economic value of germplasm and crop improvement as a climate change adaptation strategy: Samoa and Vanuatu case studies.' 2011, McGregor, A. et al. 2011.

47 "Taro Leaf Blight Manual", 2013, Mary Taylor and Tolo Iosefa, Secretariat of the Pacific Community. Available at: <https://lrd.spc.int/our-work/information-communication-and-extension/publication/-taro-leaf-blight-manual>.

48 Report to the Samoa Market Access Working Group, Development of a Report to the SMAWG Outlining Export Issues for Taro to Australia and New Zealand, 26 May 2011, URS, Kalang, Pacific Horticultural and Agricultural Market Access Program. Available at: <http://phama.com.au/wp-content/uploads/2016/07/TR-3-SAMOA01-taro-pathway-200711-FINAL.pdf>.

49 Ibid.

50 "Pacific Islands: Exporting Taro to New Zealand", Market Brief, 20 November 2012 Pacific Islands Trade and Invest, Available at: https://issuu.com/pacifictradeinvest/docs/pacific_islands-exporting_taro_to_nz.

51 Report to the Samoa Market Access Working Group, Development of a Report to the SMAWG Outlining Export Issues for Taro to Australia and New Zealand, 26 May 2011, URS, Kalang, Pacific Horticultural and Agricultural Market Access Program. Available at: <http://phama.com.au/wp-content/uploads/2016/07/TR-3-SAMOA01-taro-pathway-200711-FINAL.pdf>.



will affect the recovery of other sectors, including the communications sector.

for an estimated 10% of the employed labour force in the island country (WT/TPR/S/299, 2012).

180. The TPRs of three Members – Kenya, Brazil and Costa Rica – also highlighted how drought can deprive hydroelectric power generators of the water they need to function. In its TPR, Kenya reported inflation in electricity prices due to the higher operating costs and lower electricity output associated with frequent droughts. Both Brazil and Costa Rica also reported drops in hydroelectric power output, increased costs and forced reliance on back-up fossil fuel generation due to drought conditions.
181. One sector that may suffer direct physical damage is the travel and tourism sector. For example, after the 2009 earthquake and tsunami in Samoa, 20% of total accommodation rooms and 23% of beds were entirely or partially destroyed (Government of Samoa, 2009). A less direct mechanism through which tourism sector may be impacted is consumer perception. Even though physical facilities and infrastructure in regions affected by disasters fully recover, tourists may not go back to the regions because of misperceptions that they are still under recovery. Several PDNA reports warn that consumer perception of affected regions can slow down economic recovery (Government of Samoa, 2009; Government of Tonga, 2018; National Planning Commission, 2015c).
182. Similarly, tourism earnings declined after disasters in Samoa, Fiji, Nepal, and Vanuatu. For example, after Tropical Cyclone Evan in 2012, Fiji's trade in services balance was estimated to decline by 9.6% as a result of the decline in tourism earnings (6.7%, which is \$74.3 million), which was caused by the lower tourist arrivals (Government of Fiji, 2013). The impact of the 2017 hurricanes on the Caribbean's tourism sector was significant. The estimated tourists declined by 826,100 visitors in 2017, compared to pre-hurricane forecasts (World Travel & Tourism Council, 2018), which resulted in the loss of USD 741 million for about 11,000 jobs (World Travel & Tourism Council, 2018).
183. Not only countries directly hit by the hurricanes, but also countries which were not in the path of the hurricanes suffered from the decline of the tourists due to the public misconception that the entire Caribbean countries were destroyed by the hurricanes (World Travel & Tourism Council, 2018). The recovery of the sector is estimated to take four years, which would cause the economic losses of USD 3 billion (World Travel & Tourism Council, 2018). These conclusions are further echoed in Saint Kitts and Nevis' TPR which highlighted a decline of 1.5% in the share of GDP generated by tourism due to hurricane damage that resulted in the closure of a major resort hotel. Tourism is the largest single private sector employer, accounting
184. Other research on the tourism sector also find that natural disasters negatively affect tourist arrivals. Karatani (2008) documents that the number of tourists arriving in Thailand's Phuket international airport plummeted after the 2004 Indian Ocean Tsunami. Chiou et al (2012) find that a natural disaster in a tourist destination cause environmental changes which impact short- and long-term changes on tourist arrivals. Specifically, the authors estimate the impact of a number of disasters in Chinese Taipei and find that (1) Typhoon Herb reduced tourist arrivals by an estimated 0.53 million over three years; (2) the Chichi earthquake caused a 2.59 million loss in tourist arrivals over seven years; (3) Typhoons Toraji and Nari resulted in a 0.36 million drop in tourist arrivals over three years; and (4) Typhoon Mindulle reduced tourist arrivals by 80,000 over a one-year period.
185. Overall, the rise in imports and decline in exports following natural disasters can lead to a sharp deterioration in the trade balance. Natural disasters can also make an impact on fiscal balances and public debt. As a result of natural disasters, governments will spend more on emergency relief, reconstruction and may also offer financial support to affected businesses and to financial institutions. If governments borrow for this purpose, there will be an increase in public debt (ADB 2019). As a result, natural disasters worsen external balances because imports of reconstruction materials rise and export tends to decline (Moody's Investors Service, 2016).
186. The 2011 TPR of Japan highlights how these different economic effects come together, even for an advanced economy. The Great East Japan earthquake and tsunami resulted in sharp declines in private consumption and widespread supply chain disruptions affecting production across the country, particularly in export dominant sectors, such as automobiles and electronics. Production was also affected by the shutdown of nuclear power plants, while exports were also impacted through supply chain relationships by the floods in Thailand. Exports declined and the trade account recorded a deficit for the first time since 1980, and its current account surplus narrowed to 2% of GDP (from 2.9% in 2009). In response to the earthquake and tsunami, the national and local governments implemented supplementary budgets amounting to about 3.6% of GDP. Reconstruction was expected to be around 4% of GDP and continue till the end of March 2016. Consequently, the fiscal deficit was in excess of 10% and gross government debt rose to nearly 230% of GDP in 2011.
187. One study for Latin America and the Caribbean considered 42 large natural disasters and found that these were, on average, associated with a deterioration in the balance of payments by an amount equal to one-third of the estimated damage



- (ECLAC and IDB, 2000).⁵² Another study found that 21 major natural disasters led to an average worsening of the trade balance, owing to an increase in import growth and, to a lesser extent, a reduction in exports (Crowards, 2000).⁵³ An analysis of 12 Caribbean countries that encountered the largest damage costs relative to GDP since 1950 highlights how rebuilding can provide a temporary boost, but indirect effects spread through the economy, undermining investment, growth, and macroeconomic performance. Fiscal deficits increased in 7 of 12 countries, current accounts deteriorated, and debt-to-GDP ratios surged. In some, debt continued to rise, suggesting that exposure to frequent disasters interrupts efforts to sustain strong growth and improve public finances (IMF, 2017).⁵⁴
188. Another reason identified in the PDNAs as to why exports decline is due to damages to trade-related infrastructures, such as ports, airports, roads, and customs. In addition to losses due to physical infrastructure, economic losses can be incurred for a variety of other reasons, including reduced revenues from the cancellation of flights and vessels and increased costs (e.g., from overtime paid to workers, clean-up costs, and purchasing alternative generators). After Tropical Storm Winston in Fiji, the aviation sector reported more losses due to overtime paid to workers than from the cancellation of international flights (Government of Fiji, 2016a).
 189. In a similar vein, Martincus and Blyde (2013) investigate the effects associated with infrastructure damages in the 2010 earthquake in Chile. Their results highlight that post-disaster infrastructure shortages can put a cap on the extent of firms' operations in foreign markets. Diminished domestic transport infrastructure translates into a strong negative impact on firm export values and quantities. This impact primarily originated from a reduction in the number of shipments, and the exports of more homogeneous goods from large firms are particularly affected.
 190. Another source of lost revenue reported was due to concessions for humanitarian relief operations. For example, Fiji Ports Corporation Limited's revenues declined because of wharfage concessions for humanitarian relief vessels (Government of Fiji, 2016a). After the earthquake in Nepal in 2015, the number of flights significantly increased due to rescue and relief operations; however, revenues of the Civil Aviation Authority declined due to charge waivers for landing, cargo handling and airport terminal fees, reduced passengers on regular flights, and increased operational expenses for 24 hour operations of the international airport (National Planning Commission, 2015b).
 191. Economic theory cited in the literature points to both a positive and negative effect of disasters on trade flows. Typically, disasters are seen as disruptions of normal economic activity due to loss of production, human and physical capital and/or infrastructure. Geophysical disasters (earthquakes, volcanic eruptions, etc.) and meteorological disasters (floods, etc.) destroy or limit the use of infrastructure, and thus increase the logistic costs of both imports and exports. On the other hand, affected countries might increase their imports to meet domestic consumption needs after a disaster.
 192. International trade smooths out the disruptive effect of natural disasters on consumption by allowing countries to diversify the sources of demand and supply across countries (Casilli et al, 2015). Open markets function as risk-reducing arrangements that allow deviations between desired consumption and output, which occurs when domestic production is suddenly reduced by a natural disaster, to be smoothed by the international flows of goods.
 193. In a theoretical framework presented in Yang (2008) and Felbermayr and Groschl (2013), international flows of goods and services act as a bridge to smooth the differences between individual output and consumption. An affected country runs a current account deficit for the period during which its output is temporarily depressed, and a surplus thereafter; its trade partners display mirror positions. The shock of a natural disaster triggered intertemporal trade, thereby making countries (both the affected and the non-affected) more open.
 194. Openness to international financial flows allows this smoothing function to be taken one more step further by providing for intertemporal adjustment, allowing disaster struck countries to run current account deficits in periods of difficulty and to repay when they run current account surpluses in better years. Openness makes a country better prepared for a disaster, better able to respond when it strikes, and able to quickly recover in the aftermath.
 195. For instance, a study by Felbermayr and Groschl (2013) finds that a disaster in a specific country increases its imports by about 2% on average. They also discover that financial openness complements trade openness — imports rise more strongly for countries which score high on international

52 "A Matter of Development: How to Reduce Vulnerability in the Face of Natural Disasters", (2000), Inter-American Development Bank (IDB) and the Economic Commission for Latin America and the Caribbean (ECLAC) Available at: <https://publications.iadb.org/en/publication/11209/matter-development-how-reduce-vulnerability-face-natural-disasters>.

53 "Comparative vulnerability to natural disasters in the Caribbean". Crowards, T. (2000). Charleston, South Carolina: Caribbean Development Bank. Available at: <https://pdfs.semanticscholar.org/087d/bfea067fd722d752b30286a1ef453a1a2f5f.pdf>.

54 "Fiscal Challenges in the Caribbean: Coping with Natural Disasters", Inci Ötker and Franz Loyola in "Unleashing growth and strengthening resilience in the Caribbean" edited by Trevor Alleyne, Inci Ötker, Uma Ramakrishnan, and Krishna Srinivasan (2017) International Monetary Fund, 2017 Available at: <https://www.imf.org/en/Publications/Books/Issues/2018/02/26/Unleashing-Growth-and-Strengthening-Resilience-in-the-Caribbean-44910>.



- financial market inclusion. In another study by Li and Van Bergeijk (2016) covering 63 countries between 1970 and 2014, the authors are able to determine that the need for reconstruction and the replacement of national production raise imports by 1.9 percentage points.
196. Natural disasters can affect a country's exports through multiple channels. First, a natural disaster could impair the capability of the affected country to produce and thus export to the rest of the world. Second, costs linked to shipments are expected to increase after a disaster (e.g. highways, ports or communication networks being damaged after an earthquake or a flood). Third, a natural disaster might well induce a change in the preferences of some foreign consumers towards the goods provided by the home country, under the hypothesis that they are altruistic and equally care about the disaster-hit country (El Hadri, Mirza and Rabaud, 2018).
 197. A growing empirical literature examines the effect of natural disasters on overall trade flows, and the differentiated trade effects by region, industry or a country's characteristics. Most of the earlier empirical studies assess the effect of natural disasters on overall international merchandise trade, often based on the gravity model of trade.
 198. Gassebner, Keck and Teh (2010) is one of the first studies to examine the trade impact of natural disasters. The authors find that large disasters decrease a country's imports and exports. As a conservative estimate, a disaster reduces imports on average by 0.2% and exports by 0.1%. However, they find that countries with an open and competitive political system are more likely to see an import increase (by up to roughly 0.2%) following a disaster. In the same vein, Oh and Reuvey (2010) show that an increase in climatic disasters or political risk, for either the importer or exporter countries, reduces their bilateral trade.
 199. The disproportional impact of natural disasters on small developing economies are highlighted in a few studies. Da Silva and Cernat (2012) find that natural disasters affect most negatively the exports of small developing countries. In addition to the often high casualty figures, there can be systemic trade and development implications for these countries: exports of affected small developing countries decline by 22% following a natural disaster (whereas exports of larger developing countries are not significantly affected), and that such effects tend to last for about 3 years. More recently, Felbermayr et al (2018) used monthly trade data to examine the short-run trade effects of natural disasters. The authors find that, while developed economies are typically unaffected by disasters, least developed and highly indebted countries suffer most. In these countries, extreme earthquakes reduce exports by 16% and imports by 13%. Disaster impacts are strongest within the first quarter after the shock and vanish within a year of disaster occurrence.
 200. In an attempt to explain some puzzling evidence where natural disasters correlate with high income growth, some researchers suggest that disasters may speed up the Schumpeterian "creative destruction" process – a process of industrial mutation that constantly revolutionizes the economic structure from within, destroying the old one and creating a new one – thus ultimately allowing exports to grow after natural disasters. For example, a country whose capital stock is reduced by a natural disaster may have an incentive to replace it with capital that embodies newer technology. As such, a disaster can provide an opportunity to update the capital stock and adopt new technologies. This would lead to higher rates of productivity and GDP per capita growth.
 201. Li and Van Bergeijk (2016) find an increase of 1.6 percentage points in the exports of disaster struck countries, which they claim support the hypothesis of "creative destruction". They also conjecture that less democratic countries might have a better ability to step up reconstruction and help the survival of their exporters. A study by Meng et al (2015) focus on the impact of natural disasters on China's bilateral trade. Using data from 1980 to 2012, they find that a natural disaster hitting China tends to have a positive impact on its exports.
 202. In addition to the typical natural disasters such as earthquake, hurricanes, floods and droughts, a few studies examine the effect of a country's weather on export performance. Jones and Olken (2010) find that higher temperatures reduce substantially the growth of exports for poor countries, but not for rich countries. A poor country being one degree Celsius warmer reduces the growth of that country's exports by between 2.0 and 5.7 percentage points, and the negative impacts are more substantial on agricultural exports and light manufacturing exports. More recently, Dallmann (2018) studies the impact of weather variations on trade over the 1992–2014 period and finds that higher temperature variations in the exporter country reduce aggregate bilateral trade.
 203. One shortcoming in this growing body of literature is the concentration on the effects of natural disasters on trade in goods. Very little research has focused on the impact of natural disasters on services' trade. A recent study by Xu and Kouwoaye (2019) is the first in the literature to systematically investigate the impact of natural disasters on trade in services. They find that large natural disasters lead to a decline of services exports by an average of 2% to 3% in affected country, but have ambiguous effects on its services imports. Capital-intensive service sectors such as transport and communications are most affected by a large natural disaster, with the negative impact on communications exports lasting for up to five years after a disaster.



204. Additionally, a number of studies look at the economic impact of natural disasters on selected services sectors. For example, Siddiquee et al (2017) study the long-term effect of two bushfires in Australia on the Australian capital market as well as the contagion effect on other country's capital market. Lee et al (2018) find that the 2008 Sichuan earthquake in China caused the most substantial contagion effect in the stock market of neighbouring Asian countries.

Supply chain effects

205. A supply chain is defined as “a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services/ finances and/or information from a source to a customer” (Mentzer et al 2001). This definition implies a direct link between the companies in a supply chain. Because of the global nature of the markets and supply networks, local catastrophes increasingly result in indirect global consequences (Altay and Ramirez 2010).

206. Even if a natural disaster is generally very localized, its impact can be felt across countries that were not directly touched by the disaster. One way this can occur is through supply chains that can transmit the effect of natural disasters across many firms and countries through downstream and upstream linkages. How significant these effects are will depend on the magnitude of the natural hazard and the specificity of the goods that are produced by firms located in the chain.

207. Jones (2011) points out that, just as a chain is only as strong as its weakest link, problems along a production chain can sharply reduce output under complementarity. On the other hand, firms can diversify risk arising from country specific shocks by importing from alternative suppliers (Caselli et al, 2015). Some studies that firms with complex production processes of several inputs are less volatile as each input matters less for production (Koren and Tenreiro, 2013).

208. The two best-studied examples of exposure cascading in global supply chains are the monsoon floods in Thailand and Great East Japan Earthquake, both of which occurred in 2011. The floods in Thailand caused significant spill-over impacts on other countries through the global supply chains. In 2011 flooding had taken these facilities off-line for between four to nine weeks. More than 7,000 industrial manufacturing plants had been affected. Many of these manufacturing plants were integrated into global value chains with significant disruptions to supply as a result.⁵⁵

209. Research on the supply chain effects of the Great East Japan Earthquake echo the findings of a

well-established literature pointing to the fact that complementarities and multi-stage processing can lead to the amplification of shocks (Jones 2011; Kremer 1993). Box 8 below gives an overview of the effects reported in the economic literature.

210. A number of economic studies assess the transmission of natural disaster shocks through global supply chains on a global scale. For instance, Altay and Ramirez (2010) analyse the impact of over 3,500 disasters on more than 100,000 firm-year observations over 15 years and find that disasters impact all sectors within a supply chain while damage by windstorms and floods seem to be dramatically different from that of an earthquake. They also show that the impact of floods on total asset turnover of a firm depend on the firm's position in the supply chain: upstream partners enjoy a positive impact, and downstream partners need to plan for the opposite.

211. In a more recent study, Laura Puzzello and Paul Raschky (2014) examine the effect of disruptions to global supply chains due to natural disasters on countries' exports. Their empirical results suggest that higher supply chain vulnerability to large natural disasters significantly reduces exports. In particular, they find that earthquakes, tsunamis and storms striking at home and floods abroad pose the biggest threat to global supply chains and trade. They also find that exports of more complex goods are less vulnerable to large natural disasters, suggesting that more complex production chains are relatively more resilient and allow industries to cope better with shocks.

212. A number of more recent economic studies look at the impact of specific natural disasters. For instance, Martin et al (2011) analyse the effect of extreme weather events at home and abroad on the United Kingdom (UK) manufacturing firms' productivity and find evidence that importing from countries experiencing exceptional heat decreases UK firms' productivity, while exporting to these destinations increases it.

213. Besedes and Murshid (2014) examine the eruption of the Icelandic volcano, Eyjafjallajökull, and find that it negatively impacted exports from the affected countries to the U.S. and Japan. Ash from that eruption forced cancellations to roughly one half of all flights originating and/or terminating in Europe between April 15 and April 22. The immediate effect of this was to lower the volume of US-bound air freight by between 10.9% and 21.8%. Data on Japanese imports reveal similarly sized reductions (between 11.9% and 27.5%) in air freight bound for the Japanese market.

⁵⁵ Robert Muir-Wood, Chief Research Officer, RMS quoted in the summary report of the Second Symposium on Natural Disasters and Trade on 14 December 2018.



Box 8: Supply chain effects of the Great East Japan earthquake

For a country or a region well integrated in the supply chain, natural disasters may not only impact the local economy, but may also transmit that shock to other countries or regions through the linkages along a supply chain. A series of economic studies examines the impact of the Great East Japan earthquake.

MacKenzie et al (2012) found that both domestic and international production declined due a fall in parts and components. Japanese output decreased the most in the transportation and office equipment industries, which indirectly affected production in many service and manufacturing sectors. Abroad, China suffered indirectly the largest output losses. Despite these findings, the authors conclude that, overall, other economies might have benefitted, as production increased to substitute for Japanese products both in their domestic markets and in Japan.

Ye and Abe (2012) measured a fall in automobile production of 19.7 per cent in Thailand, 24 per cent in the Philippines, and 6.1 per cent in Indonesia due to the supply chain shock from the earthquake. Similarly, they found that electrical component production fell by 17.5 per cent in the Philippines and by 8.4 per cent in Malaysia. Those effects lasted three months (automobile) and two months (electrical components) respectively. The same study looked also looked at the 2011 floods in Thailand. While the plants of Nissan and Toyota in flooded zones were not damaged, they had to be shut down. Factories in Malaysia, Viet Nam, Pakistan, the Philippines, the U.S., and Canada expanded production to make up for the output disruptions in Thailand.

Boehm, Flaaen and Pandalai-Nayar (2018) examined the U.S. affiliates of Japanese multinationals after the 2011 East Japan earthquake. They found that US firms with high dependence on Japanese inputs suffered large output losses following the earthquake, roughly one-for-one with the fall in imports. There was virtually no scope for substitution to other inputs such that the shock passed directly to their US operations following the shock in Japan. Global supply chains can, therefore, play an important role in the cross-country transmission of shocks.

Carvalho et al (2016) provided a systematic quantification of the role of input-output linkages as a mechanism for the propagation and amplification of shocks. The authors found that the propagation of the shock through input-output linkages resulted in a 1.2% point drop in Japan's gross output in the year following the earthquake. It resulted in a decline in the growth rates of disaster area firms' downstream customers and upstream suppliers. The shock also propagated beyond the immediate transaction partners of the affected companies to firms that were only indirectly linked to those directly impacted. Firms were unable to insulate themselves from the shock due the lack of suitable alternative suppliers. At the macro level, disturbance propagated along the supply chain network, thus resulting in movements that affected a significant number of firms in the broader economy.

Source: WTO Secretariat summary of economic studies

214. Hayakawa et al (2015) explored the firm-level impact of the 2011 flooding in Thailand, specifically, the impact on procurement patterns of Japanese affiliates in Thailand. They found that small firms were more likely to lose local procurement share, especially their share of procurement from other Japanese-owned firms in Thailand. Younger firms were more likely to increase their share of imports from Japan, whereas mature firms were more likely to look to China. There was no impact on imports from ASEAN and other countries.
215. Another academic paper studied the effects of multiple natural disasters over a period of thirty years. The authors (Barrot and Sauvagnat 2016) find that affected suppliers impose substantial output losses on their customers, especially when they produce specific inputs. These output losses translate into significant market value losses, and they spill over to other suppliers. The study suggests that input specificity is an important determinant of the propagation of idiosyncratic shocks in the economy. In other words, firms' sales growth and stock prices significantly drop only when a major disaster hits one of their specific suppliers. The authors find that \$1 of lost sales at the supplier level leads to \$2.4 of lost sales at the customer level, which indicates that relationships in production networks substantially amplify idiosyncratic shocks. Their findings indicate that natural disasters have important disruptive effects that propagate along the supply chain to downstream firms, as well as horizontally into supplier networks.
216. Other studies also find evidence that the interruption of supply chains can reverberate internationally. The Philippines' imports of automobiles and parts from Thailand, for example, were observed to decline by more than 35% from January 2011 to November 2011, after floods disrupted supply chains in Thailand, than in the same period in 2010, when there was no such disruption (Haraguchi and Lall 2014). Sales of new automobiles in the Philippines in the period consequently decreased by up to 140,000 units, a 4.0% decline from the first 11 months of 2010.
217. In an IMF research paper, Korniyenko, Pinat and Dew (2017) study the impact of localized supply shocks and assess the spill-over effects of supply shocks from the import of specific goods. The authors create a country-level measure to determine supply shock vulnerability, arising from



the composition of a country's import basket, to evaluate the potential negative supply shock spill-overs. The methodology additionally can be applied to predict exporters' potential to originate negative spill-overs from natural disasters, political instability, and conflicts.

218. A 2018 background report by the OECD identified policies and practices used by governments to identify critical infrastructure assets, assess their vulnerability to hazards and threats, and to strengthen their protection and resilience (OECD, 2018). The report acknowledged that the interconnectedness of supply chains can increase critical infrastructure exposure and vulnerability to unanticipated events producing negative impacts across sectors and borders that at times resonate globally. It noted that some OECD countries include supply chains in the official definition of "critical infrastructure."
219. Supply-chain interdependencies, especially if coupled with cost-effective just-in-time delivery of components, potentially create greater indirect exposure to natural hazards for firms not directly exposed or even located in hazard zones. The propagation of impacts can occur quickly and widely in modern supply chain networks (Inoue and Todo 2018). But the role of supply chains in either propagating or mitigating business disruptions from disasters appears to depend on the characteristics of the supply chain. Specifically, the propagation effect is larger when inputs are more specific and cannot be easily substituted (Barrot and Sauvagnat 2016).
220. Thanks to those studies, it is clear that while supply chains bring economic efficiency gains, the interconnectivity of firms can create difficulties for all of them when a single member is struck. But that same interconnectivity may also bring greater scope for creating and strengthening resilience in order to mitigate the impacts of idiosyncratic shocks.
221. Some research looking at international spill-over found that these supply chain effects were typically confined within the affected country. Several studies observed neither downstream nor upstream propagation beyond national borders. For instance, using firm-level and supply-chain data on more than 100,000 major firms around the world, Kashiwagi, Todo, and Matous (2018) found the propagation effect on US firms to be smaller for larger firms and for those linked into international supply chains. International firms can find substitutes for damaged suppliers and customers more easily than can firms with purely domestic supply chains, which may explain why the international propagation of shocks is less likely.
222. Todo et al (2015) also use the 2011 Japanese earthquake to examine how supply chain networks affect the resilience of firms to a natural disaster. Their results indicate that the expansion of supply chain networks has two opposing effects on the resilience of firms to disasters. On one hand, when firms are connected with more firms through supply chain networks, they are more likely to experience disruptions in supply and demand, which delay recovery. On the other hand, firms can benefit from diversified networks with suppliers and clients because they can substitute the surviving firms in the network for the damaged partners and receive support from them. Between these two effects, their results indicate that the latter positive effect on recovery exceeds the former's negative effect for many types of network, implying that diversified supply chain networks lead to the resilience of firms to natural disasters. Their results show that the structure of supply chain networks is one of the conditions affecting the impact of disasters.
223. Beyond just expanding the number of firms in the supply chain to increase resilience, there are other ways that supply chains can be enhanced to take better account of risks and be more resilient. A recent study by Papadopoulos and al (2017), focused on the 2015 earthquake in Nepal and constructed a "big-data" framework to explain resilience in supply chain networks. They use 36,422 items gathered online from different sources (news, Facebook, Google +, Youtube, Tweeter) as well as answers from 205 managers involved in relief activities in the aftermath of this earthquake. The result of the study suggests that trust, quality information sharing and public-private partnership are critical enablers of resilience in supply chains.
224. Strengthening resilience of supply chains is a topic that has elicited a great deal of interest in the last decade, both in the private and the public sectors. The main recommendations from these studies are enhanced multi-sectoral cooperation, better information sharing, development and adoption of international standards on resilience and greater use of risk assessment tools.
225. In 2013, the World Economic Forum put forward a set of resilience measures. It consisted of (i) improving information sharing between governments and businesses, (ii) harmonizing legislative and regulatory standards, (iii) building a culture of risk management across suppliers, and (iv) implementing common risk assessment frameworks. The importance of each recommendation depends on the actual situation of the supply chain.
226. The OECD (2013) also proposed a roadmap to enhance resilience in global supply chains. It included the adoption of a multi-stakeholder approach, involving governments that would support information sharing and capability building. It recommended greater international cooperation to help reconcile and align national policies with the global nature of economic activity.
227. In 2013, the United Nations Economic and Social Commission for Asia and the Pacific also published



a document on how to build resilience to natural disasters and major economic crises. An entire chapter is devoted to the strengthening of supply chains. Their recommendations involve private-sector guidance, for example investing more in spatial diversification of production and supply, holding larger inventories and stocks, or assessing and controlling risks through business continuity plans. They also invite governments to develop better regulatory frameworks (for example on insurance matters) and to make sure that private incentives are appropriately aligned. For example, Japan offers tax incentives for investments in earthquake mitigation and tax deductions for post-disaster reconstruction. Furthermore, international cooperation initiatives have to be developed not only to bolster disaster resilience through improved infrastructure and policy guidance but also to provide recovery and assistance. Finally, the study emphasized the vital role that transnational corporations play in building resilience, especially the supply chain “anchors” who are in the best position to help their businesses partners in post-disaster reconstruction.

228. Finally, international co-operation on standard setting to enhance supply chain resilience. In 2015, the International Standardization Organization (ISO) established a technical committee (ISO/TC 292 Security and resilience) to develop standards in the area of security and resilience. The goal of ISO/TC 292 is to develop international standards that “enhance and sustain the state of being free from danger or threat and to feel safe, stable, and free from fear or anxiety”.
229. In summary, although the economic literature studying the supply chain effect of natural disasters is still nascent, it points to evidence that supply chains propagate idiosyncratic shocks at least in the short run following a natural disaster. The extent to which natural disaster shocks are amplified in a supply chain network depends on the level of input specificity (i.e. whether companies can find substitutable inputs from alternative sources). Some empirical evidence indicate that supply chain networks enable firms to more easily find substitutes for damaged suppliers. These findings bear important policy implications as the international community are gathering efforts to manage supply chain risks and building more resilient production networks.

Measures reported in Members’ Trade Policy Reviews

230. Of the 172 Trade Policy Reviews (TPRs) conducted in the period January 2010–September 2019, 54 refer to a natural disaster event – some 31%. The most commonly natural hazard cited is drought (referenced in 31 TPRs), severe storms (e.g. cyclones, hurricanes, typhoons) (9), flooding (7), and volcanoes (4), and earthquakes (3). Annex 1 tabulates the hazard or disaster reported, as well

as brief information on the measures taken, for relevant TPRs.

231. The impact of a natural disaster event in another Member is referenced in five TPRs. Uganda’s 2012 TPR referenced problems in coffee exports as a result of air transport disruption following the 2010 eruption of the Eyjafjallajökull volcano in Iceland. Korea, Turkey and Thailand highlight measures they had taken in the wake of to the Great East Japan earthquake and tsunami. Japan’s 2013 TPR also makes reference to the impact of the 2011 floods in Thailand on its exports due to supply chain relationships.
232. Measures taken to support recovery in the agriculture sector in the event of a natural disaster were reported in the TPRs of more than 20 Members. Such measures included direct compensation of producers for losses incurred, as well as the use of disaster insurance or payments (5). One TPR noted that export credit insurance also covered the risk of natural disaster in other Members. Several Members (Djibouti, Namibia and Kenya) reported actions in support of public stockholding for food security, including the establishment of such schemes in the wake of a natural disaster. Other Members took measures to update food security legislation already in legal force. Provisions for the enactment of price controls for agriculture products were reported in 14 TPRs. The use of export restrictions was also noted.
233. The TPRs of Chile, Chinese Taipei, Fiji and Thailand discuss various measures taken by these Members to address the threat or impact of natural disasters on the fisheries sector, including insurance, interest free loans and relief payments to affected fishers. Five TPRs also highlighted legal provisions in Members’ customs legislation to facilitate the entry of disaster relief.
234. Members have also reported various measures that seek to promote resilience in the TPRs. Maintaining financial reserves sufficient to cover nine months imports was one of the measures reported in the TPR of the Philippines. Ghana reported a risk management plan to mitigate the risk of droughts as well as the dissemination of an agricultural weather-index insurance product on a pilot basis. Chile, Ghana and Japan were among Members reporting mandatory legal requirements for buildings insurance.
235. Infrastructure upgrades to protect against natural hazards were reported by Bangladesh and Nepal (water management and irrigation), and Uganda (energy). To ensure food security in context of resilience Kenya distributed drought resistance crops, Antigua and Barbuda planned a food security law, Guinea, Bolivia and Nepal considered green box measure support to their agricultural sector including insurance products for farmers.



236. In the remaining text in this section, measures in support of disaster response, recovery and resilience reported in Members TPRs are listed. Annex 2 also provides further details.

Disaster response measures reported in TPR reports

237. Albania (WT/TPR/S/229/Rev1, 2010), Papua New Guinea (WT/TPR/S/239, 2010) Cambodia, (WT/TPR/S/253, 2011) Paraguay (WT/TPR/S/360, 2017) its Public Procurement Law provides for exceptions in procurement procedures for special circumstances including natural disasters. Nepal speaks about crop subsidies to provide support for disaster relief (WT/TPR/S/257, 2012). The Philippine Crop Insurance Corporation, a government-owned and controlled corporation, provides insurance to farmers for losses resulting from natural disasters. (WT/TPR/S/261, 2012)
238. The government of Chad has exempted from pre-shipment inspection a number of categories of foods. In the list figure disaster relief from foreign government (WT/TPR/S/285, 2012). Such ease of clearance can also be found in Peru (WT/TPR/S/289, 2012) which offers urgent clearance or exceptional clearance for goods imported in case of disaster or emergency. The Kyrgyz Republic provided VAT exemption on imported goods, works and services including on materials used to assist after the consequences of a natural disaster.
239. In Botswana, goods imported for a specific purpose or under different customs regimes may also be exempt from VAT. As a result, goods imported, inter alia, (1) for the relief of distress of persons in cases of famine or other natural disaster; (2) under any technical assistance agreement; (3) to fulfil obligations under any multilateral international agreement to which Botswana is a party; or (4) for welfare or charitable purposes, are exempt from VAT. (WT/TPR/S/324, 2015).
240. In South Africa, until the implementation of the Customs Duty Act, the Customs and Excise Act will continue to regulate rebates on any customs duties, the fuel levy and the road accident fund levy on specific goods imported for, inter alia, domestic consumption by diplomats (based on reciprocal treatment), special events such as international exhibitions, relief in cases of natural disasters and famines, and manufacturing and commercial use of goods re-imported into South Africa. (WT/TPR/S/324, 2015)
241. Swaziland applies export prohibitions in case of food shortages resulting from natural disasters, but indicated that these are not applied in practice. (WT/TPR/S/324, 2015) Jordan operates a temporary control of prices in case of emergencies or natural disasters. (WT/TPR/S/325, 2015) In Georgia, the Patent Law contains limitations on the exclusive rights of a patent holder to ensure the fair use of patents: according to Article 52, the use of invention in the case of natural disaster, catastrophe, epidemic or other emergency situations is not considered as a violation of exclusive rights. (WT/TPR/S/328, 2016)
242. The Moroccan Export Insurance Company (SMAEX) provides insurance at subsidized rates against political risks, disasters and non-transfer, as well as special commercial risks for companies which export capital goods, carry out public works, or supply services lasting over one year. (WT/TPR/S/329, 2016)
243. The Public Finance Management Act of Malawi empowers the Ministry of Finance, Economic Planning and Development to grant concessions, including tariff rebates, on goods deemed to be of public interest in exceptional circumstances, such as natural disasters. (WT/TPR/S/335, 2016) As a result of the overall decrease in food production in 2015 caused by drought and floods, a sharp deterioration in food security conditions occurred in 2015-16. Malawi remains vulnerable to droughts.
244. In Honduras, the Directorate-General of Consumer Protection (DGPC) is empowered to fix the price, the rate or the maximum retail margin for goods and services in the basic shopping basket; the inputs needed to produce or supply them; and the agricultural and industrial inputs required for economic activities in times of emergency, disasters or catastrophes, or if there are monopolies or oligopolies for the sale of any product. (WT/TPR/S/336)
245. In Chinese Taipei, over the review period, amendments were made to the Regulations for the Relief of Damage Caused by Natural Disasters in the wake of the 2015 typhoons. Certain crops and fisheries items which were previously not eligible for relief are now eligible for low interest rate loans. Additionally, changes were made to expand eligibility for post-disaster cash relief as well as to increase the value of such relief. As reported by the authorities, total relief allocations in 2015 amounted to NT\$3.6 billion, benefitting 139,400 households, and 353 farm or fishing households received low-interest loans totalling NT\$26 million. In 2015, the COA initiated a new programme for natural disaster insurance for agricultural crops; it subsidizes one-third to one-half of the premiums for approved insurance products offered by private insurance providers. The amount of the premium subsidy for the year 2017 was around NT\$18.23 million. Seven items have been included in the initial period of this insurance scheme (pears, mangoes, custard apples, paddy rice, aquatic products, grouper, and bird flu). (WT/TPR/S/377, 2018)



Disaster recovery measures reported in TPRs

246. The Cabo Verdean economy's vulnerability to natural disasters was demonstrated in late 2014 with the volcanic eruption on the island of Fogo. Mobilizing resources to repair the extensive damage caused by it, the VAT rate was increased from 15% to 15.5% with effect from 1 January 2015. The rate hike is intended as an extraordinary and temporary measure for the year 2015. The higher rate is applied to all goods and services, except water and electricity, which continue to be taxed at 15%. (WT/TPR/S/322, 2015).
247. China states that in response to high prices or to balance domestic supply and demand for foodstuffs, tariffs are sometimes reduced temporarily. During 2008, in response to higher international prices and supply problems following the earthquake in Sichuan, import tariffs for several food products were reduced temporarily. (WT/TPR/S/230/Rev.1, 2010)
248. In Honduras, the maximum selling price of essential services and the price of inputs needed to produce goods and services and inputs indispensable "for the country's economic activities" are also fixed by the DGPC. There is no list of goods or services subject to price control. A maximum selling price will be determined only in unforeseeable circumstances or cases of force majeure caused by emergency situations, disasters or calamities, and when goods and services are marketed under a regime of monopoly or oligopoly and the absence of free competition is proven; in the latter case, a favourable ruling by the Commission for the Defence and Promotion of Competition is required. (WT/TPR/S/234/Rev.1, 2010)
249. Sri Lanka highlighted difficulties faced in the post-tsunami reconstruction phase because of the large temporary inflow of foreign funds. The initial assumption that foreign financing was more than adequate for reconstruction was quickly dispelled as the large-scale reconstruction programme quickly raised demand for construction inputs that produced steep increases in construction costs. In turn, this produced funding gaps that had to be filled either by the government or by additional foreign assistance. (WT/TPR/S/237/Rev.1)
250. The European Union manages approximately €200 million of ongoing assistance programmes to Sri Lanka. This is in addition to the emergency relief assistance provided by the EU's humanitarian office ECHO, which is also well established in Sri Lanka and continues to provide significant humanitarian support for both conflict and Tsunami victims. The latter is being phased out as the major post-Tsunami rehabilitation programmes gets under way. (WT/TPR/S/237/Rev.1)
251. In its 2016 Review, the European Union highlighted the Pillar II programmes and measures targeted at farmers and intended to improve efficiency (e.g. investments in physical assets), productivity in the sector (e.g. aid for young farmers) (under Priority 2), and risk reduction (e.g. aid for restoring production potential after damage by natural disasters, subsidies for insurance premiums, and income stabilization) (under Priority 3). According to the Commission, 44% of funds of all the rural development plans are for improving ecosystems, 20% for improving farm viability and competitiveness, and 10% for food chain organization, animal welfare and risk management. (WT/TPR/S/357, 2017)
252. AgriRecovery is a Canadian framework programme to enable federal, provincial, and territorial (FPT) governments to provide financial assistance to producers in the event of natural disasters. Its coverage seeks to fill gaps in other business management risk and disaster relief programmes. Government assistance is ad hoc and depends on potential payments from existing programmes and on the specific disaster, based on criteria set out in the framework. As of 31 December 2010, AgriRecovery had been used in 23 disaster incidents. (WT/TPR/S/246, 2011) (WT/TPR/S/314, 2015)
253. One of the two credit institutions of greatest importance for the Mexican agricultural sector is the Fideicomisos Instituidos en relación con la Agricultura or FIRA (Trust Fund for Agriculture). In 2011, FIRA financing reached a record level of Mex\$111 billion (USD 7,927 million). Among other things, FIRA offers microcredit, facilities specially designed for financing repairs, and others for dealing with the effects of natural disasters. The specific objective of the programme described above, is to provide the rural sector with support to deal with the impact of natural disasters on agriculture, aquaculture and fishing. This is aimed at low-income producers without any form of public or private insurance and producers who, while insured through private companies or insurance funds, wish to insure for an additional amount per hectare in the event of a natural disaster (WT/TPR/S/279, 2012)
254. In Macao, an SME Aid scheme offers interest-free financial aid to help SMEs finance, including in case of natural disaster. (WT/TPR/S/281, 2012)
255. In Brazil, the Government's Agricultural Livestock Guarantee Programme (PROAGRO) covers losses related to natural disasters, plagues or diseases affecting livestock. To benefit from the PROAGRO, producers must pay a premium fee, set at 2% for the family farmers with PRONAF, and 3% for other producers (WT/TPR/S/283). In 2017, Brazil indicated that Agricultural insurance support continued to be provided to producers through four main programmes, either in the form of insurance premium subsidies covering the difference



- between a fixed premium and market rates through a discount in the fee to farmers (fixed percentage), or by compensating farmers for production losses due to natural disasters. Two of the programmes target the commercial farmers (the rural insurance premium programme (PSR) and the general agriculture insurance programme (PROAGRO)) and the other two target small-scale family farms (the family agriculture insurance programme (PROAGRO MAIS) and the crop guarantee programme (Garantía Safra, GS)) (Section 4.2.4.3). The operation of these risk management.
256. Panama provided data on its natural disaster relief support which amounted to some USD 9 million from 2007-2012. Hong Kong, China provided loans on concessional terms and emergency relief from natural disasters to farmers. The total value of loans for farm production under the various funds administered by the AFCD was HK\$29 million in 2010-13. (WT/TPR/S/306, 2015) India launched a scheme which aims to providing relief to the farmers from crop failure due to natural disasters, pests and diseases. Budget allocation: Rs 28.23 billion. (WT/TPR/S/313)
 257. Thailand provided government assistance to the fisheries sector comprising disaster relief payments and management, research and enforcement services; in 2014 these amounted to over B 881 million. In the Maldives, domestic producers receive support in the form of direct payments mainly distributed to compensate for loss of income due to natural disasters; as from 2014 the direct payments were replaced with insurance schemes for farmers as well as concessional loans to support agricultural development. In 2014, direct payments to compensate domestic producers for loss of income were replaced with two insurance schemes: the accident insurance scheme to support farmers who may be injured in farm activities, and the crop insurance scheme to compensate them for any loss of agricultural produce due to natural disasters such as floods, heavy rains and tsunamis etc. (WT/TPR/S/332)
 258. In Tunisia, the National Guarantee Fund (FNG) is intended to guarantee the granting of some categories of loan from banks, out of their regular funds or by borrowing, to small and medium-sized economic units, as well as loans to farmers in general to cover drought risk. (WT/TPR/S/341)
 259. In El Salvador, the El Niño phenomenon led to serious droughts during the 2014 and 2015 planting seasons, which mainly affected the production of red beans and maize, both an integral part of the staple national diet. El Salvador restricted exports of red beans between 15 May 2014 and 31 December 2015, as a temporary measure to maintain price stability and ensure an adequate supply of the domestic market. Measures were implemented to preserve levels of production and price stability and to prevent speculation within a context of droughts, such as those experienced in recent years; delivery of packages of maize seed and fertilizer for subsistence farmers (with USD 18.8 million of financing in 2015, delivery of packages of improved bean seed for subsistence farmers (USD 5.9 million in 2014 and USD 19 million in 2015, Design of the "National staple grains supply and marketing policy". (WT/TPR/S/344, 2016)
 260. Russia's Ministry of Agriculture has developed the regulatory framework to respond to natural disasters with compensation for costs incurred by agricultural producers for the resulting damage, enabling it, in 2015, to respond to natural disasters in 14 regions, which resulted in Rub 7.1 billion in costs to agricultural producers and 2.02 million hectares in crop losses. In response, the federal and regional authorities provided Rub 4,676.6 million, in addition to Rub 2,597.1 million for natural disasters in 2014. (WT/TPR/S/345, 2016)
 261. As part of its, agricultural domestic support measures, 2009-2015, Guatemala declared payments for relief from natural disasters (i.e. aid): Government Decree No. 15-2010 – Support for the population affected by Tropical Storm Agatha. Food aid. Government Decree No. 15-2010 – Support for the agricultural and livestock sector affected by Tropical Storm Agatha. (WT/TPR/S/348)
- ### Resilience Measures reported in TPRs
262. As Belize remains vulnerable to exogenous shocks, including weather-related disasters, diversification of the economy is seen as able to reduce dependency on a narrow range of exported commodities although this is limited by a population base of only 333,000 people. (WT/TPR/S/238/Rev.1, 2010)
 263. In order to counter the effects of climate change, the Government of Bangladesh has prepared a long-term Bangladesh Delta Plan 2100, aimed at sustainable delta management, integrated water resources management and disaster management (WT/TPR/S/270, 2012). (WT/TPR/S/385, 2019)
 264. In China in 2009, Y 908 billion (76.9% of the Y 1.18 trillion from the Central Government budget) was allocated to cover, inter alia: infrastructure investment including rail, road, and water (37.5%), reconstruction in post-earthquake areas (25%), construction of low-rent housing (10%), and rural infrastructure construction. (WT/TPR/S/230/Rev.1)
 265. In order to cope with droughts, the Kenyan government provides drought resistant seeds through the "orphan" crops programme, to farmers in the arid and semi-arid areas in order to enhance crop production in these areas. These crops include sorghum, millet, cowpeas, green gram, dry land maize hybrids, and katumani maize seeds. (WT/TPR/S/271/KEN)
 266. In 2006, following the drought period, independent power producers had entered the Ugandan market



to add to the supply of energy. Uganda reports that in 2012, half of its electricity was generated by the state-owned Uganda Electricity Generation Company. (WT/TPR/S/271/UGA, 2012)

267. Food security is a concern for low income countries like Myanmar. On 7 January 2012, the National Rice Reserves Supervisory Committee was established to purchase rice from Myanmar's states and regions (based on tender based systems), donate rice to areas affected by natural disasters, and sell rice to domestic consumers or export the surplus when the Committee considers it necessary. (WT/TPR/S/293, 2012)
268. In its 2012 TPR, Vietnam communicated on its support programmes have been or are being implemented to support the fisheries sector including: Prime Minister's Decision No. 137/2007/QĐ-TTg of August 2007 on organizing information for preventing natural disasters at sea included a project to build an information system on the management of marine fisheries.
269. In Ghana, an agricultural weather-index insurance product has been introduced on a pilot basis by MOFA in partnership with Ghana's meteorological services. This product is designed to offer protection against the negative effect of extreme weather events as well as finances to manage drought risk. (WT/TPR/S/298)
270. In Antigua and Barbuda, the government recognized that its agricultural sector faces significant risks from natural disasters such as hurricanes. To mitigate this, it planned to enact a food security law; pursue a policy of import substitution; increase budgetary allocation for the sector; and implement the land-use policy more aggressively. (WT/TPR/S/299, 2012)
271. Chile implements programmes to support the victims of natural disasters, supporting fishing industry workers, and promoting the use of insurance and non-conventional renewable energies. (Fisheries Research and Aquaculture Fund) (WT/TPR/S/315).
272. Fiji's GDP growth prospects are also constrained by high transportation costs, the small size of its economy, and the frequency of natural disasters. Therefore, accelerating the structural reforms seems necessary to support increased investment, raise the productive capacity of the economy, improve the business environment to foster Fiji's competitiveness, strengthen its resilience to shocks, and raise Fiji's potential GDP growth rate.
273. In 2011 In the Republic of Korea, Green Box support amounted to ₩7.7 trillion of which 24% went for relief from natural disasters (WT/TPR/S/346, 2016).
274. In Congo DRC, concessions granted under the Agricultural Code: Permission to establish a tax-free provision not exceeding 3% of turnover for the financial year, for the purpose of rehabilitating arable land and preventing major risks and agricultural disasters. (WT/TPR/S/339)
275. Mexico declared its programmes to support agricultural producers in improving their capacity for confronting natural disasters. The incentive granted under PROAGRO depends on the area planted and all those producers that own or lease or have beneficial interests in holdings registered under the Programme are eligible. PROAGRO benefits both commercial producers and those that produce for their own consumption, since payment depends on the area planted. The incentive is granted even if the harvest is lost, as a result of adverse weather conditions or other disasters outside the producer's control. Through its programmes, AGROASEMEX promotes the use of insurance and comprehensive risk management by Mexico's agricultural sector. Its programmes include: the Agricultural Insurance Premium Subsidy Programme, the Weather Risk Subsidy and Agricultural Disaster Insurance. (WT/TPR/S/352, 201)
276. In Guinea Bissau, the Country Programming Framework (CPF 2014-2017), based on a multi-sectoral approach to rural development, is the reference framework for medium-term planning and programming of cooperation between the Government and FAO. In the long term, implementation of the CPF should contribute to the food and nutritional security of the population, in line with the PNIA objective. To this end, the CPF identifies three priority areas: (a) performance, sustainability and efficiency of family agriculture systems; (b) resilience and nutrition of the population with regard to stresses, climate changes, food crises and natural disasters; and (c) governance in the areas of food security and nutrition and protection of natural resources. The total cost of the CPF is estimated at about CFAF 5 billion. (WT/TPR/S/362)
277. In addition to the general support programmes, Bolivia also implements sectoral programmes specifically for the agricultural sector, as well as specific programmes such as the "Pachamama" Universal Agricultural Insurance Scheme, in place since 2013, with the aim of raising agricultural productivity in general, as well as other single-product programmes such as the Dairy Production Complex Support Fund (PROLECHE) and the Sugar Cane Production Support Fund (PROCAÑA). The law also provides that the State may subsidize production in the event of emergency, price surges, natural disasters, insecurity and food shortages, inter alia (WT/TPR/S/363, 2017).
278. Agriculture represents over one quarter of GDP and two thirds of employment. Nepal's diverse topography creates the potential to produce a wide variety of products, but it faces many challenges as a landlocked LDC with poor infrastructure, small scale farming, low productivity, and a high risk of natural disasters (the 2015 earthquakes



were estimated to have caused NR 28.3 billion in damages and losses to agriculture). Current policy for agriculture is set out in the ADS 2015-2035 and several product-specific policy documents. The ADS includes a number of programmes aimed at improving efficiency, sustainability, and resilience to climate change and disasters. The largest programme is for irrigation (NR 95 billion over 10 years), and the total 10-year cost of all programmes is about NR 502 billion, about 11% of which is to come from donors. The ADS also sets out targets, with an emphasis on developing a trade surplus for agricultural goods, improving sustainability and competitiveness, and reducing poverty. The most recent notification to the WTO on domestic support is for calendar years 2010 and 2011; it showed that all support was in the Green Box, and amounted to less than 1% of the value of production.



Country research on natural disasters and trade – Summary of findings



SUMMARY OF FINDINGS

Introduction

279. On 26 April 2018, World Trade Organization (WTO) Members approved research funded by the Permanent Mission of Australia to study the impact of natural disasters on trade. The first stage of this work involved examination of the effects of natural disasters on the trade of some recently disaster-affected countries, together with trade policy issues arising. The research looked at the experience of six WTO Members in three regions. Country study one examined Dominica and Saint Lucia in the Caribbean, country study two looked at Nepal in South Asia and country study three surveyed Fiji, Tonga and Vanuatu in the Pacific. The research work was undertaken through a mixture of consultations with government and non-governmental organizations, together with desk research from published sources, including Trade Policy Reviews.

280. This note summarises the main findings of the three country research papers. A first section discusses natural hazards faced by the six Members together with the macroeconomic and trade impacts of recent natural disasters. Further sections deal with trade issues arising in disaster response, recovery and resilience among the same six recently disaster-affected WTO Members.

Natural Hazards, Macroeconomic and Trade Impacts

281. Dominica, Fiji, Nepal, Saint Lucia, Tonga and Vanuatu face a range of hydro-meteorological hazards (e.g. drought, flooding, landslides and storms, including cyclones and hurricanes) and geo-physical risks (e.g. earthquakes, tsunami and volcanoes). To varying degrees, these events have curtailed economic growth, depressed exports and fuelled import growth, exerting pressure on the current account and debt levels. Climate change is predicted to make hydro-meteorological hazards more frequent and severe.

282. Table 6 in the overleaf highlights the major natural disaster events that have occurred since 2010 for each of the six surveyed Members. It presents data on the estimated impact of each event as a percentage of gross domestic product (GDP). On an annualized basis, losses as a percentage of GDP due to natural disasters are estimated in a range of 3.4% for Saint Lucia and up to 6.6% in Vanuatu.

283. In any given year, it is likely that the five island states surveyed (Dominica, Fiji, Saint Lucia, Tonga and Vanuatu) will be either hit by, or recovering from, a major natural disaster, most commonly hydro-meteorological in origin. Nepal must also contend with seasonal rains and flooding. Prior to the 2015 earthquake, flooding accounted for 53.2%

of combined economic losses in Nepal from natural disasters over the period 1990-2014.

284. The recovery time between storm events can be short. As highlighted in Table 6, successive storms hit Dominica only two years apart (Tropical Storm Erika in 2015 and Hurricane Maria in 2017) causing damage estimated at 90% and 226% of GDP respectively. Records also show that Dominica suffered multiple storm strikes in the same season on 13 occasions between 1886-1996. The frequency of hydro-meteorological events is comparable in the Pacific. Since 1990, Vanuatu has experienced at least 20 damaging tropical cyclones.

285. Seismic hazard is an ever-present risk among most of the surveyed Members. Risk arises not only from direct damage caused by the earthquakes themselves, but also secondary hazards such as landslides and tsunamis. Nepal's topography and location in a high seismic risk area give rise to a propensity to flash floods and landslides due to steep, unstable slopes. Destructive earthquakes occur in Nepal with average return periods of some 80 years. Earthquakes tend to have graver consequences for life in Nepal than more frequent disasters such as floods, landslides and droughts.

286. The "mega events" surveyed in Table 6 tend to mask the burden of smaller, localized events. Droughts, flooding and minor earthquakes are examples of frequently under-reported events that cumulatively may have deleterious impacts on economic growth and trade in specific localities or regions. For example, some 240 earthquakes, ranging in magnitude between 3.3 and 7.1 on the Richter Scale, struck Vanuatu and its surrounding region in the first ten months of 2018. Volcanic eruptions also necessitated the evacuation of Vanuatu's Ambae island in the same year.

287. Natural disasters may also coalesce with other "man-made" factors to magnify their economic impact. In Nepal, the economic losses and dislocation from the 2015 earthquakes were exacerbated by the disruption to essential supplies on Nepal's southern border. The cumulative impact of these two events was a contraction in economic growth from a projected 4.6% down to just 0.4% in 2015. Nepal's experience underlines a broader point on the importance of transit for disaster resilience in landlocked countries.

288. Tropical cyclones (TC) and hurricanes also exert downward pressure on economic growth. TC Gita knocked three percentage points off Tonga's GDP growth in 2018. Fiji's growth dropped 2.5% after TC Winston, and Vanuatu's economic growth contracted 2.8% percentage points after TC Pam. With trade to GDP ratios above 50% for all six surveyed economies (and closer to 100% in the case of some of the island economies), weather-induced falls in economic activity rapidly translate into slow-downs in trade flows.



Table 6: Overview of impact of recent natural disasters on six WTO Members

WTO Member	Event	Damage as a percentage of GDP
Dominica	Tropical Storm Erika (2015)	90%
	Hurricane Maria (2017)	225%
Fiji	Tropical Cyclone Evan (2012)	2.6%
	Tropical Cyclone Winston (2016)	31%
Nepal	Earthquakes (2015)	33%
	Monsoon trough (2017)	3%
Saint Lucia	Hurricane Tomas (2010)	43%
Tonga	Tropical Cyclone Ian (2014)	11%
	Tropical Cyclone Gita (2018)	38%
Vanuatu	Tropical Cyclone Vania (2011)	6.3%
	Tropical Cyclone Pam (2015)	64%

Source: Post Disaster Needs Assessments

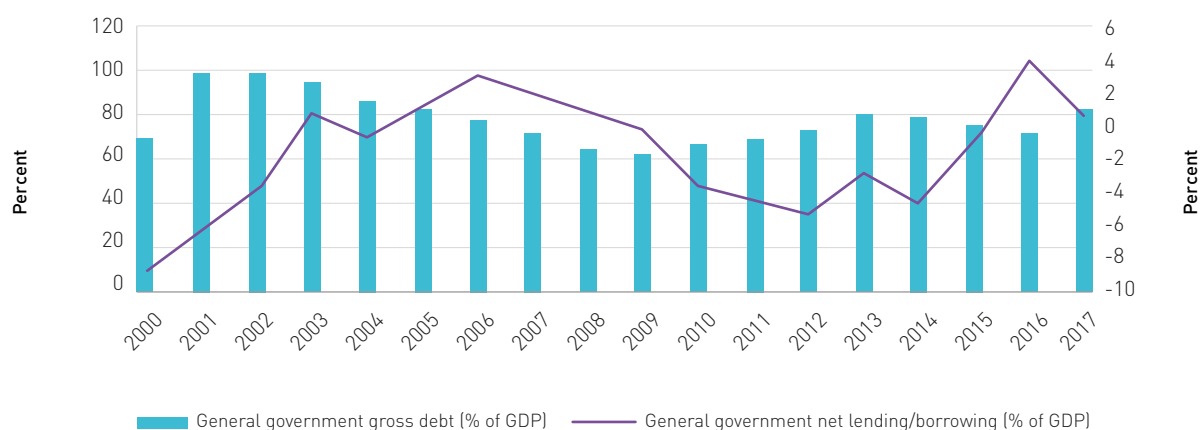
289. Reconstruction activity can be an important economic stimulus in the aftermath of disasters, but also debt-creating in the absence of sufficient external aid or dedicated domestic reserves set aside to cover such eventualities. In Dominica, fiscal adjustment and restructuring had driven public debt down from a high of 100% of GDP in mid-2000s to around 63% in 2009. Reconstruction activity in the wake of tropical storm Erika and Hurricane Maria risks placing upward pressure on public debt and creating a significant risk of debt distress in the IMF's view – see Figure 10 below. In Vanuatu, the stock of public debt to GDP increased by 20 percentage points after Cyclone Pam.

290. IMF research highlights that reconstruction and recovery efforts after disasters reduce resources for productive investment, further tighten limited government budgets, and create higher debt risk. Furthermore, projections on future debt sustainability worsen if exposure to future natural disasters is included.

291. Without transfers of Official Development Assistance (ODA), external debt would be significantly higher among some of the surveyed countries. Aid accounted for just over 5% of gross national income for Nepal in 2017. Support totalling over US\$1.3 billion in pledges and \$1 billion in loans and debt relief was agreed for Caribbean islands affected by Hurricanes Maria and Irma.

292. Defined as Upper Middle-Income Countries for the OECD Development Assistance Committee List of Official Development Assistance (ODA) Recipients, Dominica, Fiji, Saint Lucia and Tonga do not enjoy the same access to concessional ODA as their lower income peers. Consultations with national authorities in Saint Lucia highlighted serious concerns about the fiscal consequences of possible future hurricane strikes. In their view, current levels of public debt limit policy options for domestic disaster risk management, including reserving public funds as a buffer against future disaster needs.

Figure 10: Trends in Dominica's debt indicators



Source: WTO computation based on data from the World Bank and IMF



293. For several of the disaster-affected countries surveyed, remittances act as a fiscal buffer. Remittances account for some 26% of GDP in both Nepal and Tonga. Income remitted by Nepalis living abroad jumped 14.3% in 2015 (the year of the earthquakes) to reach US\$6.7 billion. Temporary labour mobility (i.e. services mode 4) schemes play an important role in this regard.
294. Natural disasters have pushed back the graduation from Least Developed Country status of both Vanuatu and Nepal. In December 2017, the UN Committee on Development Policy (CDP) recommended that in the wake of Cyclone Pam, Vanuatu's smooth transition process should reduce the country's vulnerability to natural disasters and pushed back the planned LDC graduation by three years to December 2020. In March 2018, the UN CDP noted that Nepal's economic vulnerability index score had worsened due to the 2015 earthquakes. As such, the Committee deferred a decision on Nepal's graduation to the 2022 triennial review, when it will again assess the country's development progress and graduation readiness.
295. One particular insight which emerged from the research work in St. Lucia was that the economic impact of natural disasters can be keenly even when the Member concerned is not itself directly impacted. Saint Lucia was spared direct damage during the 2017 hurricane season, but still faced trade disruption and higher costs that affected its economic performance due to weather-related disruption of regional air and maritime shipping, rerouting of consignments and delays resulting in lost business and reduced profit margins.
- Maria. Airport congestion due to landing load and plane size restrictions were a complicating factor limiting response at Tribhuvan International Airport in Nepal. Issues relating to airport runway management also arose in Port Villa, albeit after the passage of Cyclone Pam.
298. A non-exhaustive list of customs and border issues distilled from the country research is included in Box 9 below. Individually, and frequently in combination, these issues reduced the effectiveness and increased the cost of disaster response. In one example, private sector stakeholders reported wait times of six weeks or more before containers could be released from customs. Important to note is that Box 9 is neither exhaustive, nor specific to the experience or issues arising in any one of the six Members researched. It is an amalgam of the issues arising. These issues are set out more specifically in each country study.
299. How lists of relief items are established, the charges that are exempted, the duration of exemptions and quantitative restrictions on waivers for some import items were issues raised by private sector actors during national consultations in one region. For example, some considered that relief exemptions should also encompass health and safety equipment so as to reduce the risks to workers in dangerous post-disaster working environments. Distinctions were also drawn between the needs of relief organizations and households on the one hand and commercial operators on the other hand. A concern expressed by many stakeholders was that commercial actors were given lesser priority even though they were essential to economic recovery.

Trade Issues in Disaster Response

296. A range of trade facilitation issues emerged during the disaster response phase in the country research. Some of the issues can be attributed to the scale of the damage faced by relevant national authorities. Government respondents in Dominica highlighted how relief systems that had operated effectively in response to Tropical Storm Erika in 2015 were overwhelmed by the more powerful category five Hurricane Maria just two years later. The sudden onset of Hurricane Maria had also caught the authorities and population off-guard. Similarly, in Nepal, established relief systems that operated effectively in relieving distress caused by seasonal flooding were initially overwhelmed by the scale of the 2015 earthquakes.
297. In both Dominica and Nepal, damage to physical infrastructure, equipment and staffing shortages complicated the entry of relief goods. Another difficulty was that import systems even in normal times were not set up for the sudden surge in volumes of relief imports that arrived in the immediate disaster response phase. Container traffic into the damaged port of Roseau jumped from an average of 80 containers per week to a peak of 300 containers in the aftermath of Hurricane
300. Private sector representatives strongly underlined the criticality of port functions to business continuity. One example was given in relation to the import of spare parts to replace damaged refrigeration facilities for supermarkets and pharmacies. Without the rapid clearance and release of these imported parts the integrity of cold chain facilities for both drugs and food was compromised, with significant welfare consequences for the general population. A further example arising was power generation equipment urgently needed to replace damaged public and commercial electricity generation infrastructure. Similar conclusions could also be drawn for imports essential for the provision of public services e.g. water and sanitation, hospitals etc.
301. Measures taken by the Government of Tonga and its relief partners in both the preparation and response to TC Gita highlight the scope for positive peer learning. These measures included triggering state of emergency legislation *in advance* of the arrival of the cyclone; ensuring customs and other border agencies took measures to facilitate the entry of goods sent by the Tongan diaspora and applying a straightforward customs exemption policy. The example of Tonga also highlights the important role



Box 9: Customs and other border clearance issues arising in natural disasters

- Delays in triggering emergency legislation;
- Time lags in establishing effective coordination between national emergency management offices and customs and other border agencies;
- Uncertainty about the exemption of relief organizations and relief goods from customs duties;
- Doubt as to the scope and duration of exemptions from customs duties and other charges for regular “commercial” imports;
- Difficulties for customs and other border agencies in distinguishing between relief and commercial goods;
- Restrictive customs policies requiring payment in full of customs duties and other charges prior to release from customs control;
- Unfamiliarity with, and difficulties in, accessing relevant official documentation relating to customs and other border clearance formalities;
- Concern at relief actors working outside official channels and coordination mechanisms;
- Delays in securing visas and recognizing professional qualifications of relief personnel;
- Quarantine restrictions on the import of dogs that delay the deployment of search and rescue animals to disaster-affected zones;
- Cumbersome import license requirements, including for telecommunications equipment;
- Problems in securing temporary admission of relief equipment, at both entry and exit;
- Control, inspection and release procedures ill-adapted to emergency situations;
- Concerns on the part of plant and animal quarantine officials about the entry, establishment and spread of pests with relief consignments;
- Pressure on governmental revenue from prolonged, extensive customs duty and other charge exemptions; and
- Problems with the storage and disposal of unsolicited bilateral donations, including aid ill-adapted to the needs of the local population.

Source: WTO Secretariat

that social media can play in communicating need, raising relief funds and ensuring that appropriate goods are supplied.

and other border clearance systems), are bringing economic returns for regular commercial operations, and supporting future resilience.

302. Relief partners and governments recommended relief support in “cash, not goods”. Problems with the suitability, storage, and subsequent disposal of “unsolicited bilateral donations” were reported by both Fiji and Vanuatu in the aftermath of earlier tropical cyclones. One insight that emerged from the research was that a move by relief organizations to cash, instead of delivering relief goods would not *per se* reduce imports. The import dependence of the six disaster-affected states suggests that commercial imports might substitute for imported relief. In either situation, the speed and efficiency of customs and other border clearance play a critical role in disaster response.

303. Reforms to improve the efficiency of customs and other border clearance procedures were reported by all six surveyed Members. Implementation of the WTO Trade Facilitation Agreement is acting as a catalyst for reforms and holds promise in addressing some of these issues outlined in Box 9. Investments for upgrading trade connectivity both in terms of hard infrastructure (e.g. ports and airports), and soft infrastructure (e.g. customs

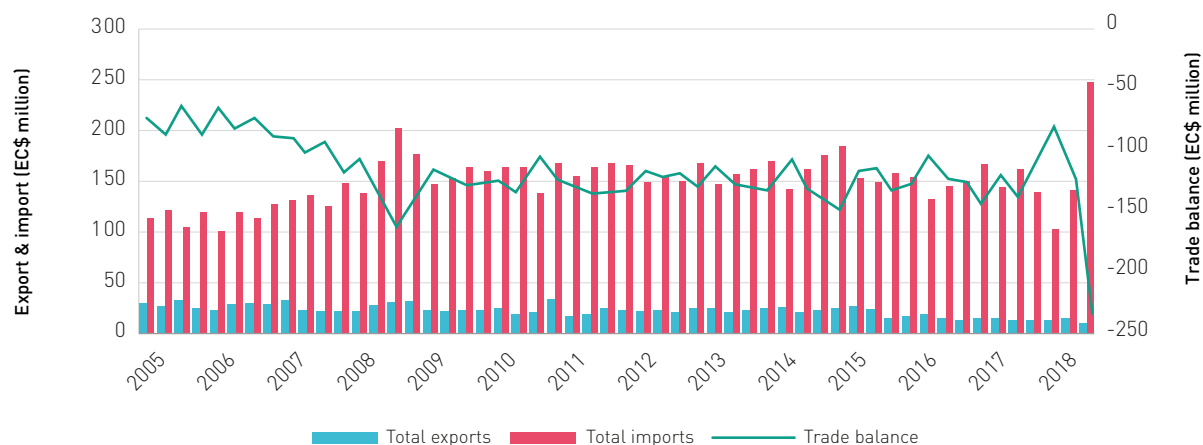
Trade Issues in Disaster Recovery

304. A surge in imports, static or declining exports and pressure on the current account are common trends that emerge from the trade performance of the six disaster-affected countries surveyed. Furthermore, disaster events tend to accentuate underlying structural trends.

305. Figure 11 below highlights the merchandise trade performance of Dominica using quarterly trade statistics. Since 2005, merchandise good exports have been on a progressive downwards trajectory. Imports show an erratic pattern with surges at the time of the onset of the financial crisis in 2008 and latterly in response to Hurricane Maria. Final quarter data for 2018 show a record quarterly import high. The green line following the merchandise trade balance also shows a progressive downwards trajectory, followed by a steep negative increase from mid-2018.

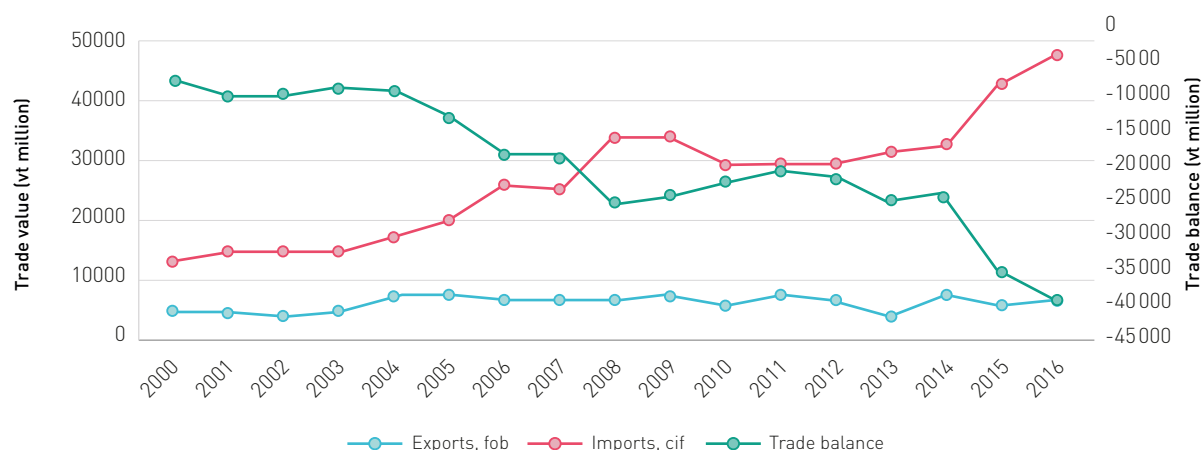


Figure 11: Trends in Dominica's merchandise trade and trade balance



Source: WTO computation based on quarterly data from the Eastern Caribbean Central Bank.

Figure 12: Merchandise exports, imports and trade balance of Vanuatu



Source: WTO computation based on data from the Asian Development Bank

306. Figure 12 above highlights the merchandise trade performance of Vanuatu since 2000. Sluggish exports have been outpaced by imports as the merchandise trade balance widens. Important to note here is that the deterioration in the trade balance *precedes* Cyclone Pam in 2015. As such, Cyclone Pam appears to have accentuated an established underlying trend. One factor to highlight is higher infrastructure investment spending which has been a factor driving import growth, financed largely through concessional lending and donor support. Similar patterns can also be observed in Tonga. Some of the infrastructure investment in Tonga can be attributed to expansion of the services sector e.g. the construction of tourism infrastructure such as cruise ship wharfs.

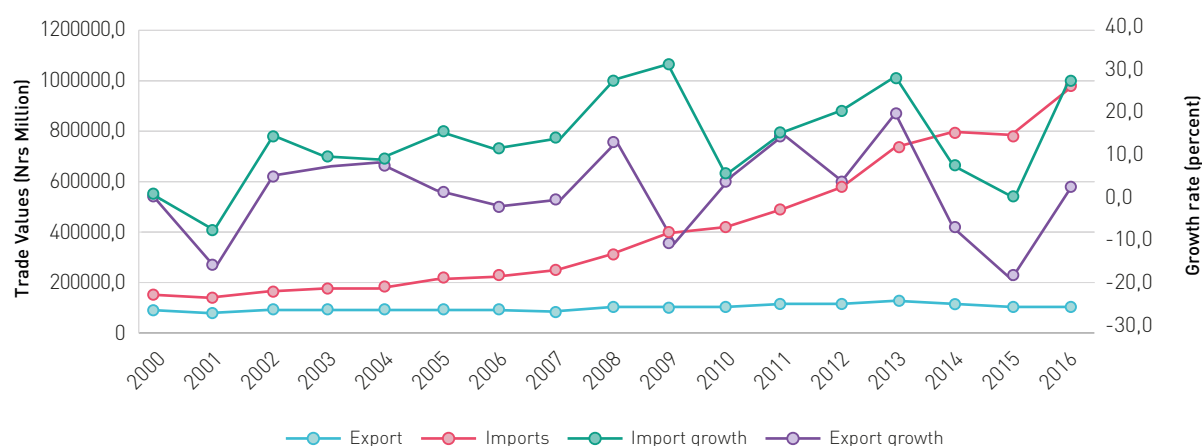
307. Activity in the construction sector associated with infrastructure upgrading and post-disaster reconstruction acts as an important economic stimulus. It can also lead to sharp increases in the import of construction materials. In Nepal, buildings sustained about 50% of the losses and damage caused by the 2015 earthquakes. Close to 0.5 million houses either collapsed or were damaged beyond repair, and more than 0.25 million were partly damaged. Due to the limited availability and/or quality of local materials, a significant proportion of building materials are imported into Nepal, mainly from India and China. This includes an estimated 80% of all cement, as well as glass, aluminium, plaster, fixtures and fittings.



308. A message which strongly emerges from Nepal's 2019 Trade Policy Review is how the earthquakes put additional pressure on Nepal's already struggling manufacturing sector. Damage to premises, stocks and machinery, together with labour shortages all disrupted operations. Growth in construction sector wage rates further

squeezed manufacturing firms' margins. Figure 4 highlights how the 2015 earthquakes accelerated import growth, but only after a solution had been found to the supply disruption at Nepal's southern border. Figure 13 also highlights the static trend in merchandise exports.

Figure 13: Trends of Export and Import in Nepal (2000-2016)



Source: WTO Secretariat computation based on data from Nepal Rastra Bank

309. Nepal is a beneficiary under the generalised system of preferences (GSP) schemes of Australia, Canada, the European Union, the Eurasian Economic Union, Iceland, Japan, Kazakhstan, New Zealand, Norway, Switzerland, Turkey, and the United States. One way in which the US sought to support Nepal's manufacturing sector was through the extension of unilateral, time limited market access preferences to its existing GSP schemes for Nepal. A WTO waiver was granted in July 2016 for these measures that cover additional duty-free treatment for 77 products, including textiles, leather, footwear, clothing and "other manufacturing products". This unilateral preferential agreement entered into force on 30 December 2016 and will end on 31 December 2025. Another element of the trade preferences was establishment of a trade facilitation and capacity-building program for Nepal.

310. This theme of natural disasters adding to existing pressure on the manufacturing sector was repeated in other surveyed Members. Sustained power outages, restricted access to credit and slow pay-outs of insurance claims were all reported as factors aggravating recovery in manufacturing and services including tourism.

311. Two firm-level examples cited in the Caribbean research work highlight this trend:

- A long-established soap and manufacturing plant in Dominica was taken into public

ownership after Hurricane Maria. The firm had just finished repairing damage sustained in Tropical Storm Erika (2015) and restarted manufacturing operations when Hurricane Maria (2017) struck. The owners decided to close the facility rather than reinvest a second time to repair machinery and facilities. The government took the plant into public ownership until a new investor was found. The firm has subsequently recommenced operations.

- Another example from Dominica concerns a coconut oil processing firm. Hurricane Maria downed many thousands of coconut trees and interrupted the domestic supply of fresh nuts. The processor had to shutter operations as it was unable to source local supply or import coconuts. The national phytosanitary authorities decided that the potential risk of entry of coconut plant diseases was too high and would set back efforts to rehabilitate the tree crop. Diseases such as lethal yellowing disease can be spread through coconut trade.

312. A sector that emerges from the research as *directly* negatively impacted is the agriculture sector. Research from the Pacific highlights that natural disasters have proven a set-back in efforts to diversify merchandise exports, notably in the agriculture sector. Much the same conclusion can be drawn also from the Caribbean research. With a high proportion of merchandise exports originating



in the agriculture sector, drops in agricultural exports have been precipitous (37% in Vanuatu after Cyclone Pam) and slow to recover, particularly for market segments with long production cycles e.g. tree crops. In addition to production losses, often in niche fresh products with narrow export windows, tropical cyclones have broken critical links in fresh produce value chains. These links are critical to gain and maintain market access to high value regional markets with stringent biosafety controls.

313. Fiji's balance of payment difficulties in the wake of Tropical Cyclone Winston (2016) are a case in point. High winds, flooding and storm surges imposed substantial damage to commercial plantations. Sugar cane production fell by 25% – a decline that in turn translated into a fall of 44% in exports of

refined sugar. Tropical Cyclone Winston inflicted further damage to a sector still recovering from Tropical Cyclone Evan in 2012. After this first event, the post-disaster needs assessment estimated that it would take between five to ten years for production to return to pre-cyclone levels.

314. A further example of a disaster "*double-whammy*" emerged from the St. Lucia research. Banana farmers there were still struggling with the after-effects of Hurricane Tomas (2010) when an outbreak of the soil-borne fungus black sigatoka further compounded their efforts to recover from hurricane damage. Changes in phytosanitary status were noted as a risk factor after disaster events and as a complicating factor in the recovery of fresh produce exports – see Box 10 below.

Box 10: Natural disasters and the spread of pests and diseases

Large scale disturbance events such as hurricanes, cyclones and typhoons have long been associated with the establishment and spread of invasive pests and diseases. Alterations of habitat characteristics (e.g. by natural disturbances), can be associated with invasion success. Disturbances benefit invasive species by reducing competition with resident species and increasing resource availability. Not only may invasive species be injurious to agricultural production, they may expose affected countries to sanitary and phytosanitary measures taken by trading partners to restrict the entry, establishment and spread of these alien pests through international trade. Examples include that of damage to citrus cultivation from invasive insects in the wake of the 2017 hurricane strikes and spread of fungi spores through flooding or even volcanic events. The presence of established plant pests may also act as an impediment to the sale of commercially valuable tree species downed by storm winds – reducing in turn incentives for clearance of damaged forest.

Source: WTO Secretariat research

315. Direct damage has also been reported to fisheries. In Fiji, tropical cyclone damage to coral reefs forced fish to migrate so reducing local catches. Similar effects were reported in Tonga where Tropical Cyclone Ian caused damage to the fisheries sector on Ha'apai island. Material losses included fishing boats, outboard motors, fishing gear, diving equipment, lines and other equipment. Tropical Cyclone Gita also caused damage to artisanal and commercial snapper boats.

316. World Bank research suggests that the fisheries sector in Dominica is "extremely vulnerable to hurricanes and storms" since there are no naturally secure harbours, and fisheries infrastructure is squeezed in between the coasts and the sea. Consequently, capital losses tend to be high in every major storm. Hurricane Maria was no exception. Approximately 128 vessels (or 40% of the total fishing fleet) were lost, fisheries cooperatives suffered damage to ice-making machines, fuel pumps and supplies for market vendors, and fishers lost a large percentage of their fishing gear.

317. Among the different sectors surveyed, services fared the best in terms of its speed of recovery, albeit with some important caveats. (Box 11 highlights issues that arose with a foreign investor in Dominica). One of the fastest service sectors to

recover was tourism – and important and growing area of economic activity for all six Members surveyed.

318. Among island states surveyed, the recovery of cruise tourism was quicker than overnight stays. The provision of accommodation as an integral part of the cruise offering seems to be an important factor in this regard. Factors holding back recovery in the overnight sector mirrored those constraining recovery more generally e.g. ability to refinance debt, access to credit, availability of and tariffs on building materials. Anecdotally, one eco-lodge owner remonstrated with the survey team at having had to pay a 60% tariff on imported paint delivered after a tariff waiver on that item had expired.

319. The resilience of services, particularly tourism is positive, not least given the scope for diversification in outbound source markets among the six surveyed Members. For all of them, investment in upgrading trade connectivity (e.g. runway, port and airport upgrading) would both boost tourist arrivals, and also increase critical airlift capacity for future disasters.



Box 11: Hurricane Maria's impact on foreign education service providers in Dominica

A services provider that decided to shutter operations in Dominica in the aftermath of extreme weather was Ross University School of Medicine. Hurricane Maria inflicted significant damage to the campus buildings forcing the evacuation of students and faculty off the island. Since then, the University had been obliged to operate from temporary locations in St Kitts and Nevis and Tennessee in the US while damage assessment, repair and rebuilding took place. On 3 August 2018 (i.e. some 11 months after the passage of Hurricane Maria), the medical school announced plans to relocate to a new campus in Barbados.

Ross Medical School (RMS) first established its Dominica operations in 1978 and was one of only four Caribbean schools to be recognized by the US Department of Education as providing medical education equivalent to US medical universities. Stakeholders at the national consultation suggested that RMS contributed somewhere between 15-20% of GDP when indirect economic benefits were included. Such benefits included: taxes paid by the medical universities and their enrolled students; income tax paid by local faculty; tariffs charged on imported products; expenditure by students and faculty including accommodation, living expenses, and entertainment; job opportunities for local citizens; and provision of consumer services to students.

In October 2018, the government reported that it was in preliminary discussions with potential investors to take over the site. Before a new lease can be agreed, an agreement needs to be reached with RMS on transfer of ownership of land and buildings it leased from the government.

Source: WTO Secretariat research

320. Some *ex ante* planning may be required to ensure that expansion in tourist arrivals is managed with forethought given to future disaster risks. Here one concern voiced by some interlocutors in Saint Lucia was that the increasingly decentralized nature of tourism due to shared economy booking apps made coordination challenging. In the past, foreign embassies needed to only contact the major hotels to reach their nationals. Freedom of movement meant that keeping track of hospitality workers from other OECS countries was also potentially challenging.

Trade Issues in Disaster Resilience

321. *Ex ante* planning speaks to the impetus being given to disaster risk management and resilience by the Sendai Framework for Disaster Risk Reduction – see Box 12. The Framework seeks to achieve the following outcome by 2030: "substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries." The preceding analysis suggests an important trade, and trade policy, dimension to achievement of this global target.

Box 12: The Sendai Seven: Global Disaster Risk Reduction Targets

- a) Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015;
- b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015;
- c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030;
- d.) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030;
- e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020;
- f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030; and
- g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

Source: Sendai Framework for Disaster Risk Reduction 2015-2030



322. The research analysis identified areas where action is already being taken by the six Members to build resilience. Prominent is the topic of reform of customs and other border clearance systems where implementation of the WTO Trade Facilitation Agreement is acting as a catalyst for reform. Further action here could also be envisaged, and not just in relation to implementation of the TFA disciplines. For example, there is further scope to work with regional partners e.g. the Caribbean Disaster and Emergency Management Agency and the Caribbean Customs Law Enforcement Council to promote coordination and mutual cooperation in the event of disasters. Similar action could be envisaged in other regions.
323. Another key principle found in the Sendai Framework is that of "Build Back Better" (i.e. in a way that is risk-informed and resilient). Building codes and standards underpin this approach. Here the experience of Nepal is instructive. The housing reconstruction programme sought to rebuild through grants for housing reconstruction that required usage of earthquake-proof building techniques and materials. With much of these building materials used coming from imported sources, there is an interplay also with standards in international trade.
324. Discussion in Dominica on how to ensure that building material imports meet local building codes (e.g. for corrugated sheet roofing) is indicative of a broader debate on the role of standards for resilience. Such standards also cover issues such as business continuity planning and involves a broad range of international and national standard-setting bodies.
325. Import tariff policy can also influence resilience. Where the hardening of infrastructure is the option pursued to improve resilience, so care is needed so that steel and cement tariffs do not act as a disincentive by pushing up prices and reducing usage of these materials. Import data from one of the regional reports indicates higher volumes of imports after tariffs were unilaterally reduced.
326. Government procurement is another avenue to pursue resilience, and one with an obvious trade dimension given the high trade to GDP ratios of the economies surveyed. In addition to the import of goods to promote resilient infrastructure, services are also an important dimension that emerges from the research. A particular services category where island Members struggled was in environmental services, notably the clearance of debris caused by hydro-meteorological events. The clearance efforts needed surpassed the capacity of local service suppliers to manage. *Ex ante* international tendering of such services could help bring down costs rather than reliance on *ex post* clean up. (None of the six surveyed Members is a party to the Government Procurement Agreement.)
327. Expanding renewable sources of electricity generation was another action identified as both boosting resilience and economic performance. The import of liquid fuels is a major drain on the balance of payments among the Members surveyed. Further development of hydro-electrical (Nepal), geothermal (Dominica) and other renewable energy sources were considered actions that could improve both the current account situation and also economic resilience.
328. All six States surveyed demonstrate a significant insurance protection gap. Otherwise stated, the amount of insurance coverage purchased is well below what is economically beneficial. Coverage is low among all six disaster-affected Members surveyed. For example, Nepal's insurance market remains small, with a limited range of products and a ratio of total assets/liabilities to GDP of 7% for insurance companies and 0.3% for re-insurance companies. In short, this means that liabilities end up with the government as the final guarantor or with family members through remittances.
329. Expansion of insurance coverage would support resilience but could require action to improve market access conditions for global reinsurance providers. Innovation in sovereign insurance products through vehicles through the Caribbean Catastrophe Risk Insurance Facility and its Pacific equivalent has pioneered the use of quick-disbursing parametric insurance schemes (i.e. schemes that pay out when certain pre-defined parameters are met, not on the basis of actual damage). Expansion of such innovations, including with backing from development partners, is one way that insurance coverage is being expanded. MSMEs are a priority group for expanded protection.
330. Parametric insurance schemes depend on hydro-meteorological observations. The role that the "weather enterprise" (including weather forecasting services) can play in disaster resilience and reduction emerged strongly. The Caribbean research highlighted not just the potential of such services for disaster resilience, but also for economic efficiency gains. For example, forecasting services are being for targeted marketing campaigns in tourism markets and also for predictions that affect the ability to offer tourism services (e.g. the likelihood of sargassum blooms). Domestic regulations for services and data regimes that permit private actors to operate in this emerging services market, traditionally the monopoly preserve of public bodies, was referenced. Improved physical protection of data and cloud storage services could also support resilience.
331. The stated intention of the Dominican Government to become the first climate-resilient nation is recognition of the need to break the cycle of periodic disasters and debt distress. IMF research suggests that a do-nothing policy will deliver dramatic negative economic outcomes, with large



permanent losses of capital, output, and growth. The same is true for others surveyed Members.

332. The three country research papers suggest that trade, and trade policy, can play a role in achieving the objective of furthering disaster resilience – both in a positive sense and a negative one. The research has borne out how the economic impact of disasters can be magnified by trade policy measures, but also how trade measures can improve disaster response, recovery and resilience.





Executive Summary – Nepal



NEPAL

Executive Summary

333. The Government of Nepal's prompt action in response to the 2015 earthquakes highlights the value of investment in preparedness. It also underscores the government's experience in responding to multiple hazards. One indication of the scale of the challenge posed by the 2015 earthquakes is that Nepal's consideration for graduation from the United Nation's least developed country category has been deferred to allow further time for recovery.
334. The scale of the 2015 earthquakes' damage (estimated at one third of GDP) posed a challenge to the government's disaster response capabilities. Shortcomings were revealed in trade connectivity, most notably in airport and road capacity – limitations that also constrain growth prospects in key growth sectors such as tourism in more normal times. Where problems arose in disaster response, these appear to have been linked to ill-adapted border clearance regulations and relief actors seeking to work outside official channels. Unsolicited bilateral donations, the legal status of some relief providers and recognition of professional qualifications were among issues cited.
335. Growth in the building and construction sector has driven post-earthquake economic recovery. More than half of damage wrought by the earthquake was incurred in the building and housing stock. Rates of insurance coverage were low. The fiscal burden for reconstruction has fallen to the government and development partners.
336. Housing grants offered by the government have boosted demand in the building and construction sector. The grants are also advancing a "build back better" agenda to better manage future seismic risk. In turn, these grants have stimulated investment in manufacturing capacity (e.g. cement production) and skills (e.g. development of appropriate building training and inspection skills). However, imports of construction materials have contributed to the trade deficit and to wage appreciation in the construction sector which has put further pressure on a manufacturing sector struggling to secure sufficient labour.
337. A defining feature of the Nepalese economy is labour migration. Income remittances jumped to 14.3% in the year of the earthquakes to reach US\$6.7 billion, clearly underscoring the value of remittances as a social safety net. Labour migration and the level of remitted income have subsequently slowed, which has in turn has put pressure on government spending. With remittances no longer able to cover imports, the current account has gone into deficit reaching US\$737 million in the first six months of FY2018.
338. Nepal's future disaster resilience would be strengthened by greater trade connectivity, both domestically and regionally. Airport capacity in Kathmandu, the only international airport, is reaching its limit and was a key bottleneck in disaster response. Government investment plans for both air and road connectivity should have positive effects on both trade connectivity and disaster resilience.
339. A further critical element in disaster resilience is predictable trade relations with regional partners. Nepal's economic prospects are closely intertwined with those of its southern neighbour. The disruption that occurred to essential supplies delayed recovery and underscores the centrality of security of transit as a factor in Nepal's resilience.

Introduction

340. Nepal's most serious constraint is its geography. On the one hand, trade and transit costs are higher for Nepal as it is a landlocked country. On the other hand, Nepal's difficult terrain due to geophysical features of high mountains and hills adds to the costs of developing infrastructure, promoting production, and doing business.⁵⁶ The terrain also gives rise to a series of natural hazards, of which the most important in their economic impact are earthquakes and floods.
341. The services sector constitutes the backbone of the Nepalese economy in terms of GDP share (57.6% in 2017-18), followed by agriculture and related activities (27.6%), construction (7.6%), and manufacturing (5.4%). It is estimated that the agriculture sector employs over two thirds of workers.⁵⁷
342. Trade (exports and imports of goods and services) accounted for 52% of GDP in FY2016-17. The Nepalese economy is highly trade-oriented and dependent on remittances (around 26% of GDP in FY2016-17), and exports of goods and services (about 9% of GDP), particularly travel and tourism (some 4% of GDP).⁵⁸
343. Nepal started to liberalize its trade and investment regime, unilaterally, in 1992 and became a WTO Member on 23 April 2004.⁵⁹ Nepal liberalized its economy in the expectation that economic reform and trade liberalization would attract investments, promote development and, contribute to generate productive employment and alleviate poverty, in a general framework of equity, participation and

56 "Trade Policy Review Report by Nepal", 8 October 2018, WT/TPR/G/381, World Trade Organization.

57 "Trade Policy Review, Report by the Secretariat: Nepal", 21 December 2011, WT/TPR/S/257.

58 "Trade Policy Review, Report by the Secretariat: Nepal", 8 October 2018, WT/TPR/S/381.

59 "Trade Policy Review, Report by the Secretariat: Nepal", 21 December 2011, WT/TPR/S/257.



market-based efficiency.⁶⁰ Accession to WTO was an essential component of the country's integration into the world economy.⁶¹

344. Nepal's annual growth averaged 4.3% in the period 2007-2017, during which time the agricultural and non-agricultural sectors grew at yearly average rates of 2.9% and 4.9%, respectively. Positive economic growth has doubled the size of the Nepalese economy as measured in Nepali rupees (NPR), from just over NPR 1.5 trillion in 2012 to NPR 3 trillion today.⁶²

345. Per capita income at the time of WTO accession was US\$240, with 38 per cent of the population living with less than one dollar a day. GDP per capita

increased to US\$708 in FY 2012-13 to US\$1,004 in FY 2017-18. Poverty alleviation is still a major challenge, with nearly six million Nepalese living in poverty out of a total population of some 30 million.

346. Nepal is a least developed country (LDC). The Government's vision is to graduate from LDC status by 2022 to become a middle-income country by 2030. Nepal meets two of the three UN Committee on Development Policy (UNCDP) criteria for LDC graduation: the human assets index and economic vulnerability index criteria. (see Box 13 below). The graduation pathway can be engaged when two of the three criteria are met. Nepal was considered for graduation for a second time at the UN CDP triennial review meeting in March 2018.

Box 13: LDC graduation process

The **Committee for Development Policy** (CDP), a subsidiary body of the UN Economic and Social Council, is mandated to review the category of LDCs every three years. In the review process, the Committee determines threshold levels on each of the three criteria to identify the countries to be added to or graduated from the category. Thresholds for graduation are higher than those for inclusion. The identification and graduation of LDCs is based on three criteria:

1. **Income criterion**, based on a three-year average estimate of GNI per capita for the period 2011-2013 using the World Bank Atlas method with under \$1,035 for inclusion, above \$ 1,242 for graduation (as applied in the 2015 triennial review).
2. **Human Assets Index** (HAI) based on indicators of: (a) nutrition: percentage of population undernourished; (b) health: mortality rate for children aged five years or under; (c) education: the gross secondary school enrolment ratio; and (d) adult literacy rate.
3. **Economic Vulnerability Index** (EVI) based on indicators of: (a) population size; (b) remoteness; (c) merchandise export concentration; (d) share of agriculture, forestry and fisheries; (e) share of population in low elevated coastal zones; (f) instability of exports of goods and services; (g) victims of natural disasters; and (h) instability of agricultural production.

To become eligible for graduation, a country must reach the threshold levels for graduation on at least two of the three criteria, or its GNI per capita must exceed at least twice the threshold level (\$2,484), and the likelihood that the level of GNI per capita is sustainable must be deemed high.

After an LDC has become eligible for graduation for the first time, an ex-ante impact assessment and a vulnerability profile are produced. To be recommended for graduation, a country must be found eligible at two successive triennial CDP reviews. A country graduates from the LDC category three years after the UN General Assembly takes note of the Economic and Social Committee endorsement of the CDP graduation recommendation. During this three-year period, the country remains on the list of LDCs. A **smooth transition strategy** is implemented after graduation.⁶³

Sources: UNOHRLLS and UNCDP

347. At the UN CDP triennial review meeting held in March 2018, progress on GNI per capita was noted, but also that Nepal remained below the LDC graduation threshold. Nepal's economic vulnerability index score worsened due to the devastating earthquake in 2015, reflecting the high vulnerability of the country to natural disasters. As such, the Committee deferred a decision on Nepal's graduation to the 2022 triennial review, when it will again assess the sustainability of the

country's development progress and graduation readiness. The Committee has decided to devote attention to the volatility of remittances, which have been critical for providing resources for improving human assets. It will also monitor possible long-lasting impacts of the 2015 earthquake followed by border obstruction at the southern part of the country. The deferment will provide additional time for Nepal to prepare for a possible graduation in

60 "Report of the Working Party on the Accession of the Kingdom of Nepal to the World Trade Organization", 28 August 2003, WT/ACC/NPL/16.

61 Ibid.

62 "Trade Policy Review, Report by the Secretariat: Nepal", 8 October 2018, WT/TPR/S/381.

63 Criteria for identification and Graduation of LDCs, UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States. Viewed on 14 November 2018. Available at: <http://unohrrlls.org/about-ldcs/criteria-for-ldcs/>.



the light of the wide-ranging constitutional and political transition in the country.⁶⁴

348. In addition to the various crises that have affected the economy since 2000, Nepal's trade performance is limited by inadequate economic, social, and trade-related infrastructure. Challenges include in the areas of road infrastructure, vocational and technical education and certification mechanisms.⁶⁵ Nepal is committed to overcoming trade-related infrastructure challenges to fully utilize its export potential and productive capacity. This would require significant investments.⁶⁶

Exposure to Geophysical and Meteorological Hazards

349. The geophysical location in one of the highest seismic risk areas, and propensity to flash floods and landslides due to steep, unstable slopes are some of the natural factors that contribute to Nepal's high vulnerability to natural hazards.⁶⁷ Nepal scores highly on the Inform Country Index for Risk Management (INFORM) which is a composite indicator that identifies countries at risk with a composite figure of 5.0 out of 10 (consisting of hazard and exposure, vulnerability and lack of coping capacity). Some of the scores for specific risks are very high. For example, for the score for exposure to earthquakes (9.9 on a scale out of 10) and exposure to floods (6.8 out of 10).⁶⁸
350. The vulnerability of the population in Nepal is a result of an interplay between low per capita income, poverty incidence, high rural population where poverty rates are higher and is compounded by the rugged terrain in the middle and high mountains that is home to almost half of the total population. The monsoon period from June to September poses the highest flood risk in the country.⁶⁹
351. The impacts of floods on lives and livelihoods are enormous – affecting over 3.8 million people, 200,000 ha of crop lands, resulting in losses of

over 3,100 lives and NPR 6 billion in the last three decades alone.⁷⁰ Prior to the 2015 earthquake, flooding accounted for 53.2% of combined economic losses from natural disasters in the period 1990-2014.⁷¹

352. In 2017, a monsoon trough caused flood damage totalling NPR 60,716.6 (USD 584.7) million, almost 3 percent of Nepal's GDP.⁷² In 2018, monsoon rains again triggered floods and landslides that affected 36 of Nepal's 77 districts. Damage was inflicted to infrastructure, including bridges and roads. Relief materials including tents, mattresses and blankets were distributed to affected communities. As a result of severe flooding in the southern plains, paddy production is estimated to have contracted by 1.5 percent from the record-high output the year before.⁷³
353. Landslides and slope failures are among the most common hazards in Nepal, due to its geography (steep, fragile slopes), triggered by natural causes (earthquakes and heavy or intense rainfall) and human influence (unplanned development, cultivation and settlements). Overall, over 4,000 lives and NPR 1 billion have been lost due to landslides in Nepal over the last three decades.⁷⁴
354. Droughts are also very common in districts of hill and mountainous ecological zones of the far and mid-western regions. Droughts over the previous decade alone have resulted in a production loss of 1.7 million tonnes of food grains, affecting over 12 million people.⁷⁵
355. Avalanches, cold waves, windstorms, hailstorms, lightning, epidemics and fires are among other hazards. Fires, especially in settlements, are among the most reported disasters and resulted in the highest losses (NPR 9 billion in the last three decades), while epidemics have led to over 16,000 deaths.⁷⁶
356. Destructive earthquakes occur in Nepal with return periods of 80 years on average, and have graver consequences for life than the more frequent

64 Criteria for identification and Graduation of LDCs, UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States. Viewed on 14 November 2018. Available at: <http://unohrrls.org/about-ldcs/criteria-for-ldcs/>.

65 Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization.

66 Ibid.

67 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

68 The INFORM model provides a risk profile for every country, which consists of a value between 0-10 for the INFORM Risk Index and all of its underlying dimensions, categories, components and indicators. A lower value (closer to 0) represents a lower risk and a higher value (closer to 10) represents a higher risk. INFORM uses historical information to describe the current level of risk. Inform Results 2019. Available at: <http://www.inform-index.org/>.

69 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

70 Ibid.

71 Nepal: Basic country statistics and indicators <https://www.preventionweb.net/countries/npl/data/>.

72 Nepal Flood 2017, Post Flood Recovery Needs Assessment, National Planning Commission, Government of Nepal Available at: <http://nra.gov.np/uploads/docs/jKT7cPkw6A171208105316.pdf>.

73 "The challenging path ahead", Nepal Development Update April 2018, World Bank Group. Available at: <http://www.worldbank.org/en/country/nepal/publication/nepaldevelopmentupdate>.

74 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

75 Ibid.

76 Idem.



disasters such as floods, landslides and droughts.⁷⁷ Nepal is the 11th most earthquake-prone country in the world. The first recorded earthquake of 1255 AD killed one-third of the population of the Kathmandu Valley. Nepal has experienced a major earthquake every few generations. The last great earthquake (of magnitude 8.4) in 1934 AD resulted in more than 10,000 deaths in the Kathmandu Valley. Infrastructure and major heritage sites had to be rebuilt. There have since been earthquakes causing severe human and physical loss in 1980, 1988 and 2011.⁷⁸

357. Nepal is located in a very high seismic risk area; a large part of the country is within the Himalayan mountain range, where seismicity predominantly is due to collision of the Indian and Eurasian continental plates. The impacts from earthquakes are magnified several-fold due to the high physical vulnerability of traditional (stone and mud) or inadequately designed masonry or reinforced cement concrete framed structures, remoteness, rugged terrain, and other societal vulnerabilities that place Nepal in 37th position out of 172 countries.⁷⁹

and caused fatalities and damages to roads, constraining the relief activities.

361. The Post Disaster Needs Assessment undertaken by the National Planning Commission estimated disaster effects at NPR 706 billion (equivalent to US\$ 7 billion) or 33% of GDP. Of that amount, NPR 517 billion (or 76 percent of the total effects) represents the value of destroyed physical assets, and NPR 189 billion (24 percent of the total effects) reflects the losses and higher costs of production of goods and services arising from the disaster.⁸¹

362. The share of estimated total disaster effects among the main sectors of social and economic activity (see Figure 14) reveals that the most affected are social sectors (58 percent of the total effects), which includes housing. This is followed by productive sectors (25 percent), infrastructure (10 percent) and cross-cutting issues (7 percent). Table 7 gives a more detailed breakdown of impacts.

Impact of the 2015 Earthquakes

358. On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre struck Barpak in the district of Gorkha, about 76 km northwest of Kathmandu. The earthquake was followed by more than 300 aftershocks greater than magnitude 4.0 (as of 7 June 2015). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the first big one with the epicentre near Mount Everest.

359. Thirty-one of the country's 75 districts were directly affected, out of which 14 were declared 'crisis-hit' for the purpose of prioritizing rescue and relief operations; another 17 neighbouring districts were partially affected.⁸⁰ The reported losses as of 9 June 2015 were 8,781 dead; 22,303 injured; 6,266 public buildings damaged; 798,897 private houses damaged and several cultural heritage buildings destroyed. The 12 May aftershock caused additional casualties of more than 200 dead and 2,500 injured. Estimates suggest that eight million people were affected by the earthquakes.

360. The ground motion of a strong earthquake causes direct damage or collapse of buildings, and can also trigger geological and/or geotechnical failure or other phenomena causing secondary disasters, such as fire, landslide, soil liquefaction and avalanches. Avalanches and landslides were identified by satellite imagery and field survey,

⁷⁷ Idem.

⁷⁸ Idem.

⁷⁹ Idem.

⁸⁰ Idem.

⁸¹ Idem.



Figure 14: Damages by sector

Source: Post Disaster Needs Assessment⁸²

Table 7: Breakdown of estimated earthquake losses by sector

	Disaster effects (NPR million)		Total	Distribution of Disaster effects (NPR million)		Losses in personal income (NPR million)
	Damages	Losses		Private	Public	
Social sectors	355,028	53,597	408,625	363,248	45,377	-
Housing and human Settlements	303,632	46,908	350,540	350,540	-	-
Health	6,422	1,122	7,544	1,394	6,150	-
Education	28,064	3,254	31,318	2,365	28,953	-
Cultural heritage	16,910	2,313	19,223	8,948	10,274	-
Productive sectors	58,074	120,046	178,121	158,079	20,043	17,124
Agriculture	16,405	11,962	28,366	25,813	2,553	4,603
Irrigation	383	-	383	-	383	-
Commerce	9,015	7,938	16,953	16,953	-	2,667
Industry	8,394	10,877	19,271	19,271	-	3,654
Tourism	18,863	62,379	81,242	75,105	6,137	6,200
Finance	5,015	26,890	31,905	20,937	10,969	-
Infrastructure sectors	52,460	14,323	66,783	17,281	49,502	-
Electricity	17,807	3,435	21,242	15,569	5,673	-
Communications	3,610	5,085	8,695	1,712	6,983	-
Community Infrastructure	3,349	-	3,349	-	3,349	-
Transport	17,188	4,930	22,118	-	22,118	-
Water and Sanitation	10,506	873	11,379	-	11,379	-
Cross-Cutting issues	51,872	1,061	52,933	1,755	51,178	-
Governance	18,757	-	18,757	-	18,757	-
Environment and forestry	32,960	1,061	34,021	1,755	32,267	-
Total	517,434	189,027	706,461	540,362	166,100	17,124
Total (Us\$ million)	\$5,174	\$1,890	\$7,065	\$5,404	\$1,661	\$171

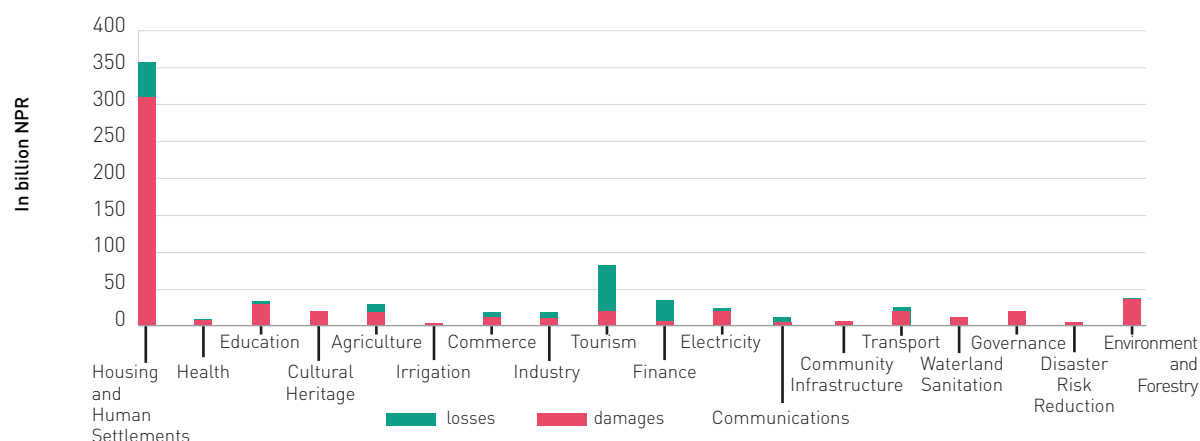
Source: Post Disaster Needs Assessment⁸³

82 Idem.

83 Idem.



Figure 15: Disaster Effects Across Sectors



Source: Post Disaster Needs Assessment⁸⁰

363. The most affected sector, housing and settlements, sustained about 50 percent of the destruction and production decline caused by the disaster, followed by tourism at 11 percent. The environment, education, finance and agriculture sectors represent between 4-5 percent each of the total disaster effects.⁸⁴

Issues Arising in Response

364. The Government of Nepal declared a state of emergency within two hours of the 25 April earthquake striking. A disaster cluster mechanism was immediately activated and an official request for international assistance made.⁸⁶ The impressive speed of response in establishing a coordination mechanism, launching the operation and setting up field hubs was attributed to the existing investment in preparedness by the Government of Nepal and its partners.⁸⁷

365. The challenge in managing disaster response in an earthquake situation is clearly spelt out in a joint 2017 WHO/IFRC study:

366. "Earthquakes are considered the most challenging type of "Sudden Onset Disasters". The difficulty of providing meaningful advance warnings means that in a matter of minutes an earthquake can cause extensive death and injury while crippling or destroying lifelines and critical care facilities, particularly the health infrastructure. Whatever the size, level of development and preparedness of the affected state, largescale seismic events are likely

to surprise the affected communities, the national authorities and the international community."⁸⁸

367. A report from the UN Logistics cluster identified three key logistics challenges at the onset of the disaster:

- **Coordination:** With a high number of organisations involved in the response (78 organisations were part of the Flash Appeal), coordination of response efforts was identified as key to minimize duplication of set-ups and optimise the humanitarian response.
- **Congestion in the Tribhuvan International Airport (TIA):** The TIA airport in Kathmandu is the only international airport in Nepal. It has one airstrip and flight size was limited to 190 metric tonnes during the emergency. Congestion in the airport would delay the delivery of relief supplies to the affected population.
- **Access:** A large part of the affected population was located in mountainous and/or remote areas, some of which were difficult to reach even prior to the earthquakes. With damages to roads and infrastructure and an increased risk of landslides after the earthquake, access was a major challenge to the response. In May 230,000 were estimated to live in areas inaccessible by road, thereby requiring air or porter/pack animal transport.⁸⁹

⁸⁴ Idem.

⁸⁵ Idem.

⁸⁶ The Regulation and Management of International Emergency Medical Teams, June 2017, IFRC and WHO <https://www.ifrc.org/PageFiles/233516/EMT%20Report%20HR.PDF>.

⁸⁷ "Nepal Lessons Learned Report", January 2016, Logistics Cluster. Available at: https://logcluster.org/sites/default/files/logistics_cluster_nepal_lessons_learned_report_160121.pdf.

⁸⁸ The Regulation and Management of International Emergency Medical Teams, June 2017, IFRC and WHO <https://www.ifrc.org/PageFiles/233516/EMT%20Report%20HR.PDF>.

⁸⁹ "Nepal Lessons Learned Report", January 2016, Logistics Cluster. Available at: https://logcluster.org/sites/default/files/logistics_cluster_nepal_lessons_learned_report_160121.pdf.



Box 14: Disaster Response Teams and the 2015 earthquake in Nepal

Disaster Response Teams (DRT) arrived within 48 hours after the earthquake to manage incoming international aid. On site, they faced a chaotic scene as emergency goods flooded in and piled up because of an acute shortage of adequate equipment to handle cargo. Nepal's only international airport was quickly overwhelmed due to the slow pace of offloading relief goods from the planes and insufficient storage space. Moreover, a landing weight limit of 196 tons was quickly imposed on Tribhuvan Kathmandu International airport's single runway to reduce the risk of damage to the runway surface. Tribhuvan's apron—where aircrafts are parked, unloaded and refuelled— could only accommodate nine planes at once. With scheduled passenger services given priority, and high demand for slots from military and civilian aircraft, the airport risked almost certain congestion. Fortunately, an area about two kilometres from the apron was earmarked as a possible "Humanitarian Staging Area" (HSA) by UN Logistics Cluster.

With all these factors, DRTs would need to tap into its wide range of expertise in airport logistics, warehouse and supply chain management in order to help put a system in place. They needed to get cargo planes offloaded quickly, then the air pallets to the HSA for eventual reloading onto trucks so that the relief aid could then be redistributed to the people in need. For any of this to be possible, they had to establish trust with all the local authorities and all other actors involved in relief efforts. On the strength of the meeting they had with all organizations on site, the DRT team was given full access to the airport.

The airport lacked proper equipment and manpower to cope with the sudden deluge of relief goods from the international aid community. The team reacted by engaging its local contacts and developing efficient and innovative ways to move the goods. Coordination between the DRTs, UN, airport authorities, NGO's and the U.S military made a tremendous difference to the success of the relief effort.

Weather-related challenges were experienced with volunteers having to work on the tarmac for 12 hours daily, under 28-30 degree Celsius. Important to note is that after the 7.8 magnitude earthquake on 25 April 2015, another major 7.3 earthquake hit on 12 May 2015. The DRTs continued to work despite the second earthquake and ongoing aftershock tremors.

Source: UNOCHA and DHL37

368. Difficulties were experienced in the initial days after the earthquake with the airport in Kathmandu struggling to cope with the volume of assistance arriving, and the need to balance commercial and humanitarian traffic.⁹⁰ One issue that the national authorities faced was that the National Calamity Relief Act did not envisage the operational and physical presence of foreign organisations to help with relief operations.⁹¹ This has been subsequently addressed in the Economic Act of Government of Nepal that incorporates provisions to address these issues. Other relevant legislation includes: the National Disaster Risk Minimize and Management Act 2018, the National Disaster Risk Minimize Policy 2019 and the National Disaster Risk Minimize Strategy 2018-2030. The National Disaster Risk Minimize Council is the institution responsible for the management disaster response.⁹²

369. The Customs Act of 2007 and the Customs Regulation of 2007 are the legal foundation regulating imports/exports, and they are administered by the Department of Customs

which is under the Ministry of Finance. Nepalese customs service had applied provisions of the Model Customs Agreement for the Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance. The agreement with the UN is on "measures to expedite the import, export and transit of relief consignments and relief personnel in the event of disasters and emergencies". It foresees that for the UN and other organisations working under its auspices, relief consignments, including tents, prefabricated houses and "other goods of prime necessity" may be imported tax-free without usual restrictions on quantities and value, and with fast track import procedures.⁹³

370. Other international organisations, such as the International Federation of the Red Cross and Red Crescent Societies (IFRC), have also concluded their own Legal Status Agreements with the government which permit tax and duty-free import of relief supplies. This included simplification of immigration processes for aid workers, including

90 Naindra Prasad Upadhaya, Permanent Secretary, Department of Commerce and Supply Management, Nepal, Statement at Fifth Global Review of Aid for Trade, 30 June-2 July 2015.

91 "Nepal Lessons Learned Report", January 2016, Logistics Cluster. Available at: https://logcluster.org/sites/default/files/logistics_cluster_nepal_lessons_learned_report_160121.pdf.

92 "Combining Capabilities- How Public Private Partnerships Are Making a Difference in Humanitarian Action" Report by United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and Deutsche Post DHL Group, 2016. Available at https://www.dpdhl.com/content/dam/dpdhl/de/media-center/responsibility/OCHA-DPDHL%20Group_Report%20on%20Public%20Private%20Partnerships.pdf.

93 Model Agreement between the United Nations and the Government of Nepal concerning measures to expedite the import, export and transit of relief consignments and relief personnel in the event of disasters and emergencies, 31 May 2007 International Disaster Response Law (IDRL) in Nepal: A Study on Strengthening Legal Preparedness for International Disaster Response", IFRC and NRCS (2011), p36).



those arriving without visas. Coordination between donors, humanitarian agencies and the government was working much better.

371. A report by the IFRC Disaster Law Programme highlighted that a significant proportion of the responsibility for customs delays resided with those sending relief consignments. Inexperienced actors often omitted required customs documentation; marked consignments incorrectly or in languages not locally understood; or failed to designate or alert named consignees. On the latter point, NGOs in Nepal noted that "In some instances, particular organisations were listed as consignees for unsolicited goods or equipment and were therefore required to pay customs fees and taxes, which they were not able to afford."⁹⁴ Such issues added to congestion.
372. In response to the clearance and coordination issues, the government brought representatives together of agencies responsible for clearance to streamline processes. Initial difficulties in clearing humanitarian aid (notably in making use of the single window system) had been resolved and clearance was taking place in 15 to 20 minutes.⁹⁵ Other obstacles were also encountered in distribution of relief items due to disruption of the transport system and bad weather.
373. A further issue cited by the IFRC concerned the critical role of telecommunications and information technology equipment in ensuring the effectiveness of disaster response operations. The IFRC report observed that whilst satellite phone technology would have been extremely useful for communicating in times of disaster, it was very costly and had not been granted any tax, licensing or import exemptions, which placed it out of reach of most relief providers.⁹⁶
374. The WTO Secretariat Report prepared for the 2018 Trade Policy Review highlights that Nepal requires import licences or permits for several products that were included in the disaster relief effort, including specific communications equipment (such as wirelesses, walkie-talkies, transmission receivers, link radio equipment, etc).
375. Commercial imports continued alongside relief supplies. Speed and efficiency of border clearance procedures were critical in ensuring the continued functioning of domestic markets. Nepal has undertaken various institutional reforms to promote trade-facilitation. The Government through Department of Customs has been introducing Customs Reform and Modernization Strategies and

Action Plan (CRMSAP) since 2003. Implementation of the 5th CRMSAP started in 2017 and continues until 2021. The 5th CRMSAP envisions essential reform strategies, including, expedited legitimate trade facilitation, enhanced customs automation & data management, streamlined coordinated border management, organizational restructuring to support risk-based clearance, among others.⁹⁷

376. An e-Customs master plan is being implemented. Web-based ASYCUDA world system has been implemented in 15 customs offices, covering about 98% of total trade. Implementation of the system in the remaining five customs offices is in the process. The development of Nepal National Single Window (NNSW) is in progress and is expected to be completed in 2019. Risk-based selectivity module (green, yellow and red channel) has been implemented. Moreover, a national Trade Facilitation Committee has been established. Following Nepal's ratification of the TFA on 24 January 2017, Nepal acceded to the Revised Kyoto Convention in February 2017.⁹⁸
377. Significant developments have taken place in the areas of trade facilitation. Nepal has signed trade and transit agreements with its neighbouring countries. Nepal ratified the WTO Agreement on Trade Facilitation, and deposited its instrument of acceptance on 24 January 2017. It also notified its category A, B, and C commitments under the TFA to the WTO. According to these, two measures are under Category A (or 2% of commitments) as implemented, eight measures under Category B are to be implemented by December 2020 without capacity-building support, and 26 measures (or 85% of commitments) under Category C are to be implemented upon receipt of capacity-building support. No indicative or definitive implementation dates have been indicated for category B or C measures.

⁹⁴ "Regulatory barriers to providing emergency and transitional shelter after disasters Country case study:Nepal", IFRC, <https://www.ifrc.org/Global/Publications/IDRL/country%20studies/Nepal%20Shelter%20Full%20Report%20FINAL.pdf>.

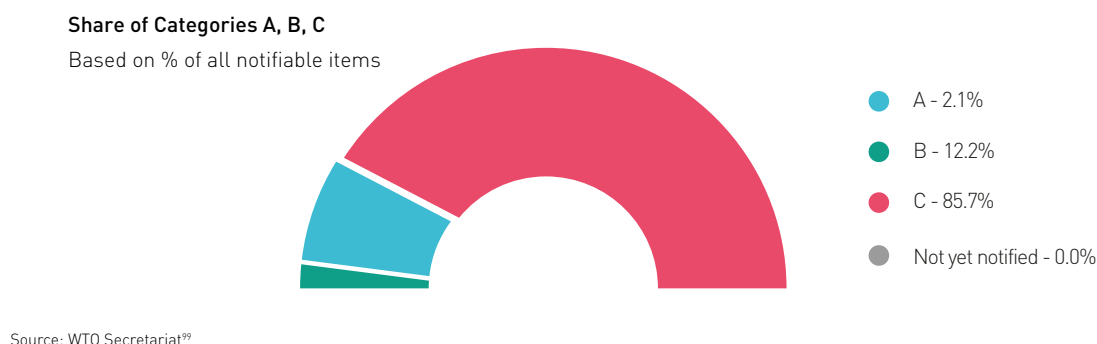
⁹⁵ Naindra Prasad Upadhaya, Permanent Secretary, Department of Commerce and Supply Management, Nepal, Statement at Fifth Global Review of Aid for Trade, 30 June-2 July 2015 p.104 Available at: https://www.wto.org/english/tratop_e/devel_e/a4t_e/global_review15prog_e/5gr_review_e.pdf.

⁹⁶ "Regulatory barriers to providing emergency and transitional shelter after disasters Country case study:Nepal", IFRC, <https://www.ifrc.org/Global/Publications/IDRL/country%20studies/Nepal%20Shelter%20Full%20Report%20FINAL.pdf>.

⁹⁷ Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization.

⁹⁸ Ibid.



Figure 16: Nepal's commitments under the Trade Facilitation Agreement

378. A further issue highlighted by the IFRC concerned recognition of professional qualifications. No special provisions are made for doctors or medical professionals who are seeking to enter the country on short notice to provide medical services in disasters and emergencies. Relief providers also face risk of expulsion or other types of civil or criminal liability. For example, one international medical NGO was reportedly expelled from Nepal for failing to comply with medical registration requirements.¹⁰⁰ A joint 2017 WHO/IFRC study noted that on 29 April 2015, the Emergency Medical Team (EMTs) coordination had communicated a clear message that no further teams were required as trauma cases had decreased and there were no gaps that foreign emergency teams were needed to fill. The Ministry of Health leader for international response co-ordination, with the agreement of the Minister for Health requested that all EMTs en route without firm tasking location, and all that were on standby, should stand down.”¹⁰¹

Issues Arising in Recovery

379. The Post-Disaster Needs Assessment estimated that economic growth would decline by more than 1.5 percentage points from projected full year GDP growth of 4.6 per cent. Actual economic performance was more severely impacted than predicted. A fall of more than 4 percentage points in GDP growth was registered, with GDP growth of 0.4% recorded. The disruption of supplies that began in September 2015 on Nepal's southern border further added to the negative impacted of the earthquakes on the economy (see Box 15).

380. Figure 17: Imports have grown from US\$5,916 million in 2011 to US\$10,038 million in 2017. Goods imports continue robust double-digit growth averaging US\$833 million per month in the first half of FY2018 – well-above the five-year average of US\$557 million.

Box 15: Disruption of essential supplies

A second shock followed in September 2015 in the form of a near-complete disruption in cross-border trade with India. Acute shortages of fuel, raw materials, and essential supplies across the country caused prices to soar and industry and businesses to curtail economic activity. As a result, Nepal experienced its lowest growth in the last 14 years, barely avoiding a recession. While the effects of the trade disruptions may be temporary, they obstructed earthquake reconstruction efforts, dampened economic momentum and delayed a post-earthquake reconstruction recovery.¹⁰²

On 20 November 2015, the UN Secretary-General underlined his growing concern over the blocking of essential supplies on the Nepal-India border. He noted alarm at reports of the obstruction, and destruction, of life-saving medical supplies and the continued impact on humanitarian operations. He called on all sides to lift the restrictions without further delay and underlined Nepal's right of free transit.¹⁰³

Source: World Bank and United Nations

⁹⁹ Trade Facilitation Agreement Database, WTO. Available at: <https://www.tfadatabase.org/members/nepal/measure-breakdown>.

¹⁰⁰ “Regulatory barriers to providing emergency and transitional shelter after disasters Country case study: Nepal”, IFRC, <https://www.ifrc.org/Global/Publications/IDRL/country%20studies/Nepal%20Shelter%20Full%20Report%20FINAL.pdf>.

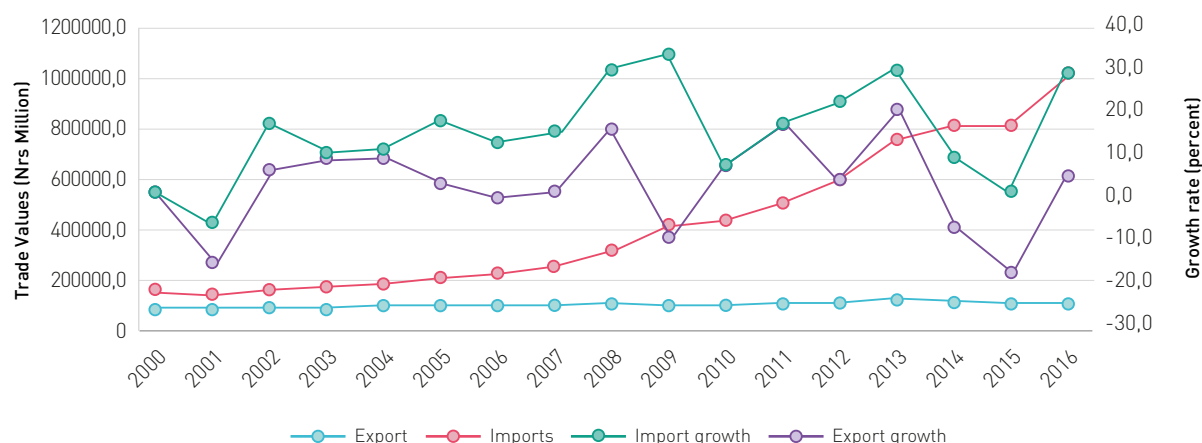
¹⁰¹ The Regulation and Management of International Emergency Medical Teams, June 2017, IFRC and WHO <https://www.ifrc.org/PageFiles/233516/EMT%20Report%20HR.PDF>.

¹⁰² “Climbing Higher: Toward a Middle-Income Nepal”, May 2017 Nepal Country Economic Memorandum, World Bank. Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.

¹⁰³ Statement attributable to the Spokesman for the Secretary-General on the situation on the Nepal-India Border, 20 November 2015, United Nations Secretary General. Available at: <https://www.un.org/sg/en/content/sg/statement/2015-11-20/statement-attributable-spokesman-secretary-general-situation-nepal>.



Figure 17: Trends of Export and Import (2000-2016)



Source: WTO Secretariat computation based on data from Nepal Rastra Bank

381. Growth has been driven by both oil and non-oil imports. Among non-oil imports, consumer goods and household food items have remained fairly flat most likely due to a slowdown in growth of remittances. Both industrial and capital goods imports, however, have remained strong driven by materials needed for reconstruction and infrastructure projects.¹⁰⁴ The largest category of imports were machinery and transport equipment with 24.7% share in 2017 (18.4% in 2011).¹⁰⁵ Projections for 2018FY suggest that the

trade normalisation along the southern border of the country is expected to contribute to further increase in import of construction materials like cement, wires, rods, coils, bars, other machinery and parts.

382. Another effect of the earthquakes has been to turn Nepal's current account surplus into a deficit in FY 2016-17 due primarily to increasing imports of goods and services while remittances declined as a percentage of GDP (see Table 8 below).

Table 8: Selected economic indicators, 2012/13-2017/18

Real sector						
GDP						
GDP per capita (US\$)	708	725	766	748	866	1,004
Real GDP growth (% change)	4.1	5.99	3.3	0.59	7.91	6.29
Consumption expenditure (% GDP)	89.4	88.1	90.8	95.9	88.1	85.0
Gross national savings (% GDP)	40.7	45.7	44.1	40.1	45.4	43.9
Gross fixed capital formation (% GDP)	22.6	23.5	28.0	28.7	31.8	34.1
Exports of goods and services (% GDP)	10.7	11.5	11.6	9.5	9.1	8.8
Imports of goods and services (% GDP)	37.5	40.8	41.5	39.3	42.9	45.5
Inflation (CPI average, % change)	9.9	9.1	7.2	9.9	4.5	4.2
Government finance						
Total revenue (NPR billion)	296.8	363.6	405.9	482.1	609.2	732.20
Total expenditure (NPR billion)	358.6	435.1	531.3	601.0	837.2	1,046.51
Public debt (% of GDP)	31.9	27.9	25.4	27.6	26.4	30.3

¹⁰⁴ "The challenging path ahead", Nepal Development Update April 2018, World Bank Group. Available at: <http://www.worldbank.org/en/country/nepal/publication/nepaldevelopmentupdate>.

¹⁰⁵ Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization.

Foreign (% of GDP)	19.7	17.7	16.1	17.2	15.6	17.3
External sector						
NPR/US\$ (period average)	88.0	98.3	99.5	106.4	106.2	104.4
Remittances (% GDP)	25.6	27.7	29.0	29.6	26.3	25.1
Current account (%GDP)	3.4	4.6	5.1	6.2	-0.4	-6.6

.. Not available.

a Fiscal year ends in mid-July.

b Preliminary.

c Average annual percentage change; appreciation (+), depreciation (-).

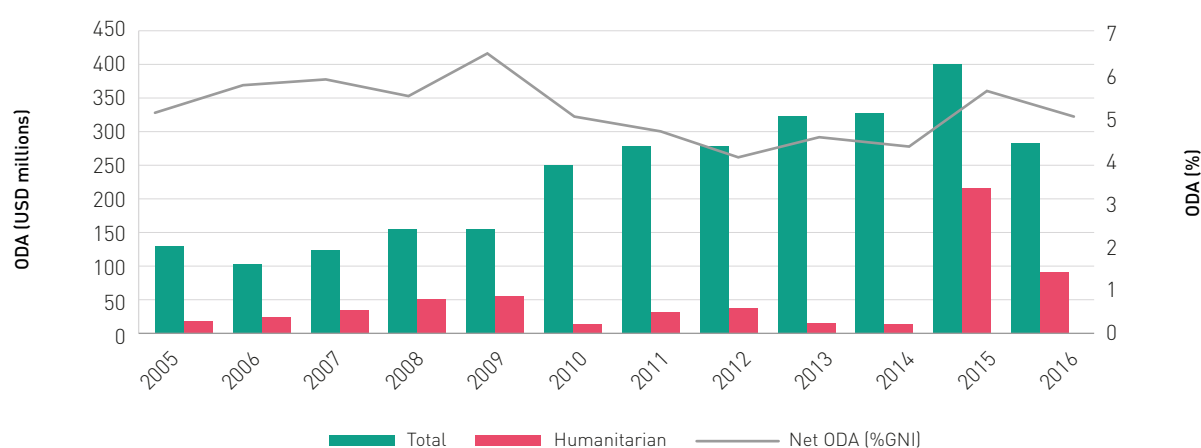
Source: Ministry of Finance (2017), Economic Survey Fiscal Year 2017/18, Vol. I, Table Macro Economic Indicators; IMF Country Report No. 17/74; Central Bureau of Statistics online information: http://cbs.gov.np/sectoral_statistics/national_accounts/naoNepal201718; and information provided by the authorities.

383. One factor mitigating the current account deficit is development finance. Aid accounted for just over 5% of gross national income in 2017 according to World Bank figures. An international donors conference, "Toward a Resilient Nepal" was held in Kathmandu on June 25, 2015, to organize support for Nepal based on the needs identified in the Post Disaster Needs Assessment. At the conference, approximately US\$4.4 billion was pledged in support of Nepal's recovery and reconstruction efforts.¹⁰⁶

384. Figure 18 highlights trends in official development assistance as reported to the Organisation for

Economic Cooperation and Development's Creditor Reporting System. Disbursements of humanitarian relief totalled US\$215.1 million in 2015, a figure that was in addition to regular programme aid disbursed (US\$397.9 million) by donors reporting to the CRS in 2015. Support was channelled through various delivery mechanisms: central and local government, the World Food Programme, eight UN agencies, bilateral aid programmes, local and international non-governmental organizations. The OECD data records a total of 329 ODA grants provided in humanitarian relief, with an average project size of US\$0.7 million.

Figure 18: Official Development Assistance flows to Nepal from OECD Development Assistance Committee reporters



Source: OECD Creditor Reporting System and World Bank

106 World Bank website, <http://www.worldbank.org/en/events/2015/06/11/toward-a-resilient-nepal-donor-conference>.

Figure 19: Savings rates and earthquake reconstruction



Source: WTO Secretariat calculation based on data from the World Development Indicators, World Bank

385. Figure 19 highlights savings were also used by households and businesses to mobilize financial resources to fund recovery. The effect is most noticeable in 2016, when gross domestic savings as a percentage of GDP fell by 11.9% to 3.8%.

386. The most affected sector by the 2015 earthquakes, housing and settlements, sustained about 50 percent of the destruction. A total of 498,852 houses either fully collapsed or were damaged beyond repair, and 256,697 were partly damaged. The catastrophic impact of the earthquake on the built environment of Nepal was primarily the result of the significant seismic vulnerability of unreinforced masonry buildings. Prior to the earthquake, the PDNA found that there was a general lack of awareness of seismic risk in communities, coupled with lack of dissemination of improved construction practices (particularly rural areas), and a slow mechanism for enforcement of relevant building codes.¹⁰⁷

387. To address the aftermath of the earthquake in 2015, the Government formed the National Reconstruction Authority (NRA) to manage the earthquake recovery and reconstruction in Nepal. The NRA's objectives are set in the National Reconstruction Policy and focus on among others building resilience for communities at risk in the earthquake-affected districts, improving the resilience of the settlements and resettling the affected communities to appropriate sites.¹⁰⁸

388. To address housing reconstruction, the Government of Nepal launched a housing reconstruction

program. The program serves as a coordinating framework to standardize housing reconstruction policy, irrespective of the funding sources. It aims to rebuild using earthquake-safer building techniques through grants and technical assistance. In conjunction with training, homeowners receive a subsidy for housing reconstruction in three tranches, upon proper completion of various stages of construction, as certified by a government engineer. The staged subsidy is meant to incentivize owner-driven reconstruction adherence to seismic safety standards.¹⁰⁹

389. Of the 667,662 beneficiaries eligible for housing grants, over 85 percent have been enrolled and received the first tranche in February 2018. More than 40 percent of the houses are under construction as beneficiaries start receiving grants, and disbursement of the second tranche has also picked up, but third-tranche disbursements are still low.¹¹⁰

390. Reconstruction of the housing stock led to a sharp increase in the import of construction materials (Table 9). Due to the limited availability and/or quality of local and manufactured materials in Nepal, a significant proportion of building materials are imported, mainly from India and China. This includes an estimated 80 percent of all cement, as well as glass, aluminium, plaster of paris, fixtures and fittings.¹¹¹

107 Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. B Sector Reports" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_volume_BFinalVersion.pdf.

108 <http://nra.gov.np/en/#>.

109 Post-Earthquake Housing Reconstruction Support, 9 August 2017, USAID website Available at: <https://www.usaid.gov/nepal/fact-sheets/post-earthquake-housing-reconstruction-support>.

110 "The challenging path ahead", Nepal Development Update April 2018, World Bank Group. Available at: <http://www.worldbank.org/en/country/nepal/publication/nepaldevelopmentupdate>.

111 Regulatory barriers to providing emergency and transitional shelter after disasters, Country case study: Nepal", Nepal Red Cross Society and the International Federation of Red Cross and Red Crescent Societies, Geneva, 2014 Available at: <https://www.ifrc.org/Global/Publications/IDRL/country%20studies/Nepal%20Shelter%20Full%20Report%20FINAL.pdf>.



Table 9: Import values and growth of construction materials

Year	Values (in Million Rupees)				Growth rates (%)			
	Cement	Wire rod	Wire product	Enamel & other paints	Cement	Wire rod	Wire product	Enamel & paint
2013	9718.3	6480.3	1165.2	1869.8	3.1	58.4	35.2	40.4
2014	10125.5	5433.1	1289.5	1901.7	4.2	-16.2	10.7	1.7
2015	11689.5	7940.8	1394.7	2027.7	15.4	46.2	8.2	6.6
2016	24032.5	92612	2015.8	2328.4	105.6	1066.3	44.5	14.8

Source: Computation based on data from Nepal Rastra Bank

391. The import of cement jumped by more 137% from NPR 10.1 billion in 2014 to NPR 24 billion in 2016. Similarly, there were significant increases in both the value and growth of the import of enamel and paints, wire rod and wire products.
392. A 2014 study by Nepal Red Cross Society and the International Federation of Red Cross and Red Crescent Societies on the housing stock indicated a number of challenges, both practical and legal, that needed to be addressed on shelter and accommodation, including:
- Limited availability of some materials in Nepal, partly due to environmental protection regulations which prohibit the use of materials from protected areas;
 - Lack of compliance with national standards by local manufacturers, and inadequate enforcement mechanisms, making it difficult to procure adequate quality materials on the local market;
 - Priority given to cost rather quality under the Public Procurement Act and difficulties with the anti-competitive behaviour of suppliers;
 - Lack of compliance with emergency shelter material standards by Shelter Cluster partners; and
 - Limitations on international procurement under the Public Procurement Act in cases where goods are available on the local market.¹¹²
393. With regard to preference for local suppliers under the Public Procurement Act, 2007 (as amended), and the Public Procurement Regulations, 2007, the TPR highlights that although discrimination is prohibited, goods manufactured in Nepal should be acquired if the difference in price compared to foreign goods is not more than 10%, and for consultancy services, international consultants must have a local agent.
394. Insurance coverage for damaged housing stock is almost non-existent in Nepal. Nepal's insurance market remains very small, and has a limited range of products. In mid-July 2016, the ratio of total assets/liabilities to GDP was 7% for insurance companies and 0.3% for re-insurance companies.¹¹³ Liabilities end up with the government as a final guarantor.
395. While the insurance sector as a whole is thinly capitalized, the number of claims made in response to the earthquake was low given the scale of the disaster (estimated by the Insurance Association at 15 thousand potential claims representing a maximum of NPR 16 billion of covered losses). The impact of losses was also mitigated by the fact that around 80 percent of their liability are covered under re-insurance treaties. The Insurance Association estimated that its total losses (i.e. net of reinsurance provided by foreign reinsurers) from the earthquake would not be more than NPR 2 billion.
396. Insurance coverage is compulsory for third-party liability insurance on motor vehicles and migrant workers who are required to have an insurance policy covering any kind of accident, disability or death. Section 38 of the Labour Act of 1992 (as amended) establishes mandatory insurance for certain occupations, which is provided via a personal accident policy. The PDNA suggests tying rebuilding to expansion of property insurance coverage and recommended some form of direct government assistance given the lack of insurance cover, scarcity of savings, and higher poverty levels.¹¹⁴
397. The 2015 earthquakes disaster created a short-term labour shortage in the manufacturing

112 Idem.

113 "Nepal, Trade Policy Review, Report by the Secretariat", 8 October 2018, WTO Secretariat WT/TPR/S/381.

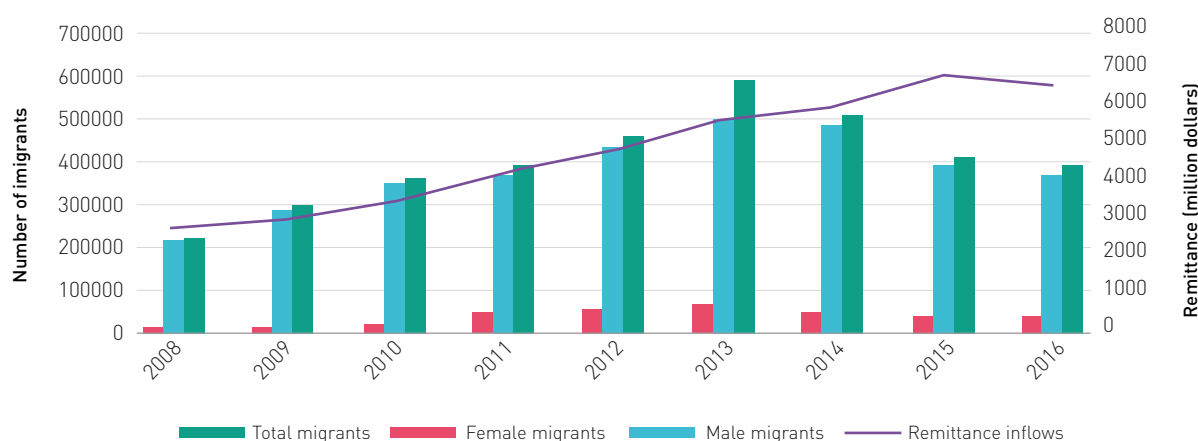
114 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.



sector. A large number of migrant workers (both Indian and Nepalese) absented themselves from their workplace either out of fear or to help their families.¹¹⁵ Damage to premises, stocks and machinery, together with a lack of labour disrupted the manufacturing sector's operations. Roads, bridges and customs points were severely affected, which had significant implications for both merchandise and services trade.¹¹⁶ An increase in wage rates in the construction sector (the daily rate of workers doubled from NPR 500 before the quake to NPR 1000 in June 2015) also squeezed the manufacturing sector.¹¹⁷

398. Short term labour shortages are indicative of the broader structural labour market issues created by large-scale labour migration. Out of a total workforce of 14 million, some 4 million Nepalese (28 percent) are believed to be working abroad. Since the end of the conflict in 2007, the labour force has increased, on average, by about 330,000 new entrants each year. Registered outward migration exceeded the increase in labour force each year, averaging 375,000 during this period. This is leading to a sharp reduction of labour supply inside Nepal.¹¹⁸

Figure 20: Migration and remittance flows 2008–2016



Source: World Bank ¹¹⁹

399. The 2015 earthquakes appear to have dampened the outflow of migrant workers, which reached a five-year low in FY2017 (see Figure 20). During the first half of FY2018, an average of 30,000 Nepalese workers per month departed for employment opportunities abroad. This is the lowest monthly average outflow of migrant workers since FY2011, when the global economy was still recovering from the impact of the 2007–08 global financial crisis. Workers leaving for Qatar, Malaysia, Saudi Arabia, and the United Arab Emirates – the four main destinations – continued to remain soft. A factor cited by the World Bank was reduction in public spending in destination countries due to low crude

oil prices on international markets.¹²⁰ Another factor may have also been rising wage rates in the Nepalese building construction sector driven by reconstruction financing.

400. Slowing remittances are being outpaced by the growing trade deficit, and have resulted in a current account deficit. While the volume of remittances continued to average over US\$550 million per month in FY2018, its growth has been slowing. In contrast, the trade deficit continues to surge. With remittances no longer able to finance the trade deficit as in the past, the current account deficit has increased significantly to US\$737 million in the

115 The 1950 Peace and Friendship Treaty between India and Nepal provides for the free movement of people between the two countries.

116 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

117 Idem.

118 "Climbing Higher: Toward a Middle-Income Nepal", May 2017 Nepal Country Economic Memorandum, World Bank. Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.

119 Labour migration for employment: a status report for Nepal: 2014/201 (http://www.worldbank.org/en/topic/labormarkets/brief/migration-and-remittances) Note: Migration figures exclude the Nepali migrant workers who migrated to the Republic of Korea for foreign employment through the government-to-government Employment Permit System. From 2008 to 2012, both inflows and outflows of remittance increased by 76% (\$2727 million to \$4792 million) and 900% (\$5 million to 50 million) respectively. In relative terms, outflows grew at a higher rate than inflows.

120 "The challenging path ahead", Nepal Development Update April 2018, World Bank Group. Available at: <http://www.worldbank.org/en/country/nepal/publication/nepaldevelopmentupdate>.

first six months of FY2018, up from US\$9million compared to the same period in FY2017.¹²¹

FY 2004/05 to 1:13.5 in FY 2016/17. Nepal's trade deficit has grown by more than ten-fold.¹²²

401. Merchandise exports decreased from US\$907.6 million in 2011 to US\$740.7 million in 2017, mainly due to the effects of the earthquakes and trade disruptions, while the appreciation of the real exchange rate also affected the competitiveness of Nepalese exports. The merchandise goods export structure remains heavily concentrated in textiles, clothing, and agricultural products which, together, accounted for 74.6% of total exports in 2017, against 64.6% in 2011
402. In the view of the Government, the trade deficit poses a challenge to Nepal's development (see Table 10). The share of exports in total trade decreased from 28.3% in FY 2004/05 to 6.9% in FY 2016/17. The share of import has increased from 71.7% in FY 2004/05 to 93.1% in FY 2016/17. The export-import ratio has deteriorated from 1:2.5 in
403. Merchandise exports are highly concentrated geographically. However, the share of India, Nepal's single most important export market destination, decreased from 67.7% in 2011 to 56.7% in 2017, caused by lower growth in India. China and the United States also increased their share in Nepal's total merchandise exports.
404. Nepal is a beneficiary under the GSP schemes of Australia, Canada, the European Union, the Eurasian Economic Union, Iceland, Japan, Kazakhstan, New Zealand, Norway Switzerland, Turkey, and the United States. Nepal does not participate in the Global System of Trade Preferences (GSTP) amongst developing countries. Box 16 outlines the additional trade preferences offered by the United State to Nepal in response to the earthquake.

Table 10: Nepal's trade scenario 2004/05-2016-17

Fiscal Year	Exports (NPRNPR billion)	Imports (NPRNPR billion)	Trade deficit (NPRNPR billion)	Export-import ratio
2004/05	58.4	148.3	-89.9	1:2.5
2005/06	59.8	160.7	-100.9	1:2.7
2006/07	58.9	195.8	-136.9	1:3.3
2007/08	58.5	237.0	-178.6	1:4.1
2008/09	68.6	291.0	-222.4	1:4.2
2009/10	60.9	375.6	-314.7	1:6.2
2010/11	64.6	397.5	-333.0	1:6.2
2011/12	74.1	498.2	-424.1	1:6.7
2012/13	77.4	601.2	-523.9	1:7.8
2013/14	91.4	722.8	-631.4	1:7.9
2014/15	86.6	784.6	-697.9	1:9.1
2015/16	71.1	781.1	-710.0	1:11
2016/17	73.1	986.0	-912.8	1:13.5

Source: Trade Policy Review¹²³

121 "Climbing Higher: Toward a Middle-Income Nepal", May 2017 Nepal Country Economic Memorandum, World Bank. Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.

122 Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization.

123 Ibid.



Box 16: Trade Preferences Granted by the United State of America to Nepal

The trade preferences build on an existing framework of US programs intended to assist Nepal's economic development, including a Trade and Investment Framework Agreement that entered into force in April 2011. Nepal also benefitted from the US generalized system of preferences scheme which allowed many products to enter the United States duty-free.

In response to the impact of the 2015 earthquakes, the United States considered that an emergency response was required and that Nepal needed substantial additional support to pursue its social and economic recovery, including in the form of increased market access for its exports.

As such, the United States applied for WTO waiver to implement a unilateral, time limited trade liberalization program, targeted at stimulating Nepal's exports and attracting more foreign direct investment. The waiver was granted in July 2016 and covers additional duty-free treatment for 77 products originating. Of the total number of tariff lines receiving preferences, 56 are "textiles"; 10 are "leather, footwear, etc."; 9 are "clothing"; and the remaining 2 are "other manufacturing products". This unilateral preferential agreement entered into force on 30 December 2016 and will end on 31 December 2025.

Another element of the trade preferences was establishment of a trade facilitation and capacity building program for Nepal so as to:

- Enhance the central export promotion agency to support successful exporters and to build awareness among potential exporters about opportunities abroad and ways to manage trade documentation and regulations in the United States and other countries;
- Provide export finance training for financial institutions;
- Assist the Government of Nepal in maintaining publication on the Internet of all trade regulations, forms for exporters and importers, tax and tariff rates, and other documentation relating to exporting goods and developing a robust public-private dialogue, through its National Trade Facilitation Committee; and
- Increase access to guides for importers and exporters, through publication of such guides on the Internet, including rules and documentation for United States tariff preference programs.¹²⁴

Source: World Trade Organization

405. During the PDNA consultation process, stakeholders from the Commerce, Industry and Supplies sector recommended the following policy measures, some of which could be integrated into the sector strategy following discussion and validation by Government and other stakeholders:

- Increased government budget to the sector for recovery and revival, in order to cover direct losses and to channel additional practical assistance to MSMEs, in particular in high-priority sectors such as construction and for target groups with specific needs, such as returning migrant workers, youth and women;
- Development of an overall industrial vision addressing import-substitution and export growth;
- Downward adjustment of interest rates to avoid depression and of cash reserve ratio rates for ensuring sufficient liquidity;
- Temporary relaxation of rules regarding provisioning by the Central Bank to allow for rescheduling of loans;
- Reductions in corporate tax and VAT;
- Subsidies and reductions in customs duties on materials that are key for reconstruction;
- Implementation of the national employment policy to address the lack of availability of skilled labour and weak links between the supply and demand of labour; possible temporary measures (e.g. wage subsidies) for securing labour; and enactment of the revised draft Labour Act for securing harmonious and enabling industrial relations and to stimulate the attraction of workers to the domestic industrial sector; and
- Infrastructure-related measures (e.g. road construction for linkages to neighbouring countries) and trade financing mechanisms to boost trade.¹²⁵

¹²⁴ "Trade Preferences Granted by the United States of America to Nepal", Request for a WTO Waiver, 29 June 2016, G/C/W/724.

¹²⁵ "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: <https://www.preventionweb.net/publications/view/44973>.



406. Unreliable access to power is consistently identified by firms as the greatest obstacle to their operations, and a contributory factor to Nepal's poor manufacturing performance over the past decade.¹²⁶ However, according to the Nepal Electricity Authority, the reliability of power supply has improved and as of May 2018, it has ended the load-shedding to all consumer categories.¹²⁷
407. Nepal's most abundant and yet underexploited resource is hydropower. The 2015 earthquakes damaged hydropower plants, transmission system (substation and lines), and distribution lines. The PDNA estimated the cost of physical damage at NPR 17.8 billion and operational losses of NPR 3.3 billion for power sales revenues and about NPR 97 million for the Government in royalty payments.¹²⁸
408. Given its natural endowments, it is possible to envision an electricity sector in Nepal that could boost growth, poverty reduction, and shared prosperity for the country.¹²⁹ The period 2016-26 has been declared National Energy Crisis Reduction and Electricity Development Decade (Energy Emergency Decade). Nepal recognizes that it must accelerate the development of its abundant hydropower potential to reduce poverty and stimulate economic growth. Hydropower development would provide clean energy to enhance economic and social development in rural and urban areas, and enable Nepal to generate revenue from the export of excess energy to neighbouring countries.¹³⁰
409. Tourism is one of the most significant contributors to the national economy in terms of income, employment, foreign exchange and extending market for domestic production of both commodities and services. Nepal offers world class destination due to its outstanding natural beauty, biodiversity, and rich cultural heritage. Majestic mountains (8 out of 14 of the world's highest peaks), socio-cultural diversity, World Heritage sites, religious sites (including Lumbini, Pashupatinath, Janakpur, Muktinath, etc.), natural heritage (including various national parks and wildlife sanctuaries) and adventure tourism opportunities, form the core of Nepal's tourist offer.
410. The 2015 earthquakes hit the tourism sector badly. Among productive sectors, it sustained 52% of estimated losses, with the PDNA estimating that damage totaled approximately NR 18.8 billion. The majority of the damage was sustained (86%) by hotel accommodations and home stays (9%), with hiking trails also affected. Tourist arrivals saw a year-on-year decline of 31% in 2015 or 251,148 arrivals. In the first three months after the first earthquake struck (May-July 2015), tourist numbers were down by about 90% according to the Post Disaster Needs Assessment.
411. The sector has been quick to return to growth after the earthquake. Nepal has seen consistent progress in the last 2 years with impressive growth rates of about 40% and 25% in 2016 and 2017, respectively.¹³¹ Table 11 gives data on tourists and tourism.¹³²

Table 11: Key tourism data for Nepal

Year	Total tourists	Total tourists by air	Total tourists by land	Average length of stay (in days)	Per day expenditure (US\$)	Receipts from tourists (US\$ million)	Number of hotels	Number of beds
2012	803,092	598,258	204,834	12.1	35.6	379	853	31,657
2013	797,616	594,848	202,768	12.5	42	388.9	1,026	34,523
2014	790,118	585,981	204,137	12.4	48	472.2	1,075	36,179
2015	538,970	407,412	131,588	13.2	70	544.3	1,073	36,950
2016	753,002	572,563	180,439	13.4	53	392.7	1,062	38,242
2017	940,218	760,577	179,641	12.6	54	510	1,101	39,833

Source: Ministry of Culture, Tourism and Civil Aviation/MoF.

Note: The figures do not include Indian tourists who travel to Nepal by land.¹³³

412. The National Tourism Strategy, 2016-2025, launched in November 2016, seeks to tap into this potential by mobilizing domestic investment, promoting foreign direct investment in the sector,

¹²⁶ Ibid.¹²⁷ https://nea.org.np/annual_report.¹²⁸ "Climbing Higher: Toward a Middle-Income Nepal", May 2017 Nepal Country Economic Memorandum, World Bank. Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.¹²⁹ Ibid.¹³⁰ "Trade Policy Review, Report by the Secretariat: Nepal", 8 October 2018, WT/TPR/S/381.¹³¹ "Nepal, Trade Policy Review, Report by the Secretariat", 8 October 2018, WTO Secretariat WT/TPR/S/381.¹³² Ibid.¹³³ Idem.

and implementing strategies such as branding, marketing, infrastructure development and improvement of quality of tourism. Some primary targets include increasing arrivals to 2.5 million, average length of stay to 15 days, average spending per tourist per day to USD 90, jobs in the tourism sector to 898,000, foreign exchange earnings from the sector to NPR 340 billion, and the sector's contribution to Nepal's GDP to 9.3%, by 2025.¹³⁴

413. More than 1700 foreign investment projects have been started in the tourism sector with worth about NPR 137.7 billion in total and have created almost 65,000 direct jobs since 2011. The Government recognises the need to address gaps in tourism-related infrastructure to truly unleash the potential of tourism sector in Nepal.¹³⁵
414. Agriculture contributed 27.4% of Nepal's GDP in 2017/18 and accounts for two-thirds of employment. It is the main contributor to household level food and nutrition security of the rural population. Farmers are mainly smallholders with an average farm size of 0.68 ha and low productivity. Agriculture is largely semi-subsistence. In value terms, crop production is dominant with rice, maize, wheat,

potatoes and vegetables as the main products.¹³⁶ Agriculture in Nepal is characterized by volatility and relatively low yields compared to neighbouring countries. Agricultural productivity growth, though modestly increasing, has been one of the lowest in the region.¹³⁷

415. Nepal's diverse topography favours the production of a wide variety of products but it equally engenders challenges including a high risk of natural disasters. The earthquakes of 2015 and flooding in successive years (2017 and 2018) negatively impacted the sector. Table 12 compares the impact of the 2015 earthquakes and the 2017 flooding. It highlights that the monetary value of estimated damage and losses from the 2017 flooding was 130% higher than that resulting from the earthquake. In practice, the impacts were different. The earthquake damaged agricultural-related infrastructure such as grain stores and stocks, service centres, livestock shelters, milling facilities, dairies agriculture tools, equipment and machineries. The flooding had a more direct on production, with direct losses in crops, livestock and poultry, and some infrastructure such as irrigation systems.

Table 12: Summary of damages and losses in the agriculture sector from the 2015 earthquakes and 2017 floods

Sector	Earthquake effects (NPR million)			Sectoral share of earthquake effects (NPR million)		Flooding effects (NPR million)		
	Damages	Loss	Total	Private	Public	Damages	Loss	Total
Crops, fishes and bees	9,005	9,213	18,218	16,578	1,640	7,213	4,751	11,964
Livestock and poultry	7,400	2,718	10,117	9,207	911	10,670	8,210	18,880
Irrigation		31	31	28	3	17,460	17,460	34,920
Total	16,405	11,962	28,366	25,813	2,553	35,343	30,421	65,764

Source: Statistics based on the 2015 Earthquake post disaster needs assessment and 2017 post flood recovery needs assessment.

416. The earthquakes and floods affected the food security of the population. The earthquakes made approximately 3.5 million people vulnerable with immediate food needs, out of whom 1.4 million people were considered highly vulnerable. Female-headed farming households in the 24 districts hit by the earthquake disaster were the most affected.
417. The flooding and 2015 earthquakes has stimulated growth in food imports. Imports jumped 29.5% from US\$1.39 billion in 2014 to US\$1.8 billion in 2017.

The government plans to double agricultural production in the next 5 years by modernizing, diversifying, commercializing, and restructuring the sector.¹³⁸ Other policies aim at improving efficiency, sustainability, and resilience to climate change and disasters. The largest programme is for irrigation (NPR 95 billion over 10 years), and the total 10-year cost of all programmes is about NPR 502 billion, about 11% of which is to come from donors.

134 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

135 Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization.

136 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: https://www.npc.gov.np/images/category/PDNA_Volume_A.pdf.

137 "Climbing Higher: Toward a Middle-Income Nepal", May 2017 Nepal Country Economic Memorandum, World Bank Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.

138 "Nepal, Trade Policy Review, Report by the Secretariat", 8 October 2018, WTO Secretariat WT/TPR/S/381.

418. Total damage and losses in revenue in the telecommunications sector from the 2015 earthquakes were estimated at NPR 3.6 billion (US\$36.10 million) and NPR 5 billion (US\$50.85 million), respectively. Network congestion and downtime were experienced. Damage was mainly incurred on aerial cables. Fibre optic cables for network backhaul that were ducted and buried were not adversely affected. One issue encountered was a lack of reliable power and insufficient supply of fuel for diesel engine generators which caused network downtime. A large number of subscribers were also out of reach as they were unable to charge their mobile phones, or use their computers due to a lack of power. Operators faced operational losses due to downtime. Some also voluntarily incurred revenue loss through the provision of free services to customers.¹³⁹
419. The 2015 earthquakes demonstrated very clearly the critical role of the communications sector. Post-disaster in Nepal relief efforts relied heavily on telecommunications, internet and broadcast media. The Government's disaster risk reduction strategy includes the use of monitoring and early warning systems some of which rely on telecommunications networks. Further, geo-mapping activities (e.g., Open Street Map) rely on availability of internet access.¹⁴⁰
420. Telecommunications is a major source of tax and royalty revenues for the Government of Nepal (GON). As such, overall sector revenues for 2014 were estimated at NPR 85,900 million (US\$859 million) and GON received approximately NPR 3,450 million (US\$34.5 million) in royalties. The two major telecommunications operators are some of the largest taxpayers in Nepal.
422. Nepal's 14th Development Plan (2016/17–2018/19) targets annual average growth of 7.2% and a reduction in the share of the population living in poverty from 21.6% currently to 17% by 2018-19. Investment in infrastructure of US\$13-18 billion by 2020 is estimated to be required.¹⁴² Infrastructure investment will address trade-related performance constraints and shortcomings in disaster resilience.
423. The January 2016 report of the Logistics Cluster identified air and road transport, and Remote Access Operations as areas where lessons could be learned from the response to the 2015 earthquakes. For example, to facilitate access to areas inaccessible by road transport and by air, a system of transport of relief supplies with porters and pack animals was set-up.¹⁴³ Box 17 explains the important role played by air services in the aftermath of the 2015 earthquakes.
424. Tribhuvan International Airport (TIA) is nearing passenger capacity and the domestic terminal is operating beyond capacity. A modernization in four phases is being undertaken. The feasibility study and construction of an alternate airport in Kavrepalanchok is being expedited to manage the air traffic pressure at TIA, although its financial viability may be in question. Another international airport at Nijgadh is to be constructed. The total project cost is US\$6.7 billion (including the development of an airport city). The Pokhara Regional Airport is being upgraded to a regional international airport. The Gautam Buddha Airport is also being transformed into a regional international airport at a cost of US\$90.6 million. Construction of domestic airports will be expedited. A master plan will be prepared for the expansion of domestic airports.¹⁴⁴
425. Under a liberal, open sky approach Nepal has signed bilateral air service agreements and MOUs with 36 countries. The bilateral agreement with India calls for the provision of 30,000 seats per week and unlimited air cargo flights between six metropolitan cities of India and Nepal. Similarly, there are 10,000 seats per week to seven Chinese cities under that bilateral agreement.¹⁴⁵

Issues Arising in Resilience

421. In the opinion of the World Bank, to tackle the persistent challenges of low investment and weak productivity, Nepal needs to dramatically restructure its public investment program; intensify the level of competition in the domestic market in sectors such as transport, logistics and telecommunication; reduce the cost of doing business; and steadily integrate the economy with the rest of the world.¹⁴¹ Many of the actions identified would positively impact on disaster resilience and are areas where the government is taking action.

139 "Nepal Earthquake 2015. Post Disaster Needs Assessment Vol. A Key Findings" National Planning Commission, Government of Nepal, Kathmandu 2015 Available at: <https://www.preventionweb.net/publications/view/44973>.

140 Ibid.

141 "Climbing Higher: Toward a Middle-Income Nepal", May 2017 Nepal Country Economic Memorandum, World Bank Available at: <http://www.worldbank.org/en/region/sar/publication/climbing-higher-toward-a-middle-income-country>.

142 Trade Policy Review Report by Nepal, 8 October 2018, WT/TPR/G/381, World Trade Organization

143 "Nepal Lessons Learned Report", January 2016, Logistics Cluster Available at: https://logcluster.org/sites/default/files/logistics_cluster_nepal_lessons_learned_report_160121.pdf.

144 "Nepal, Trade Policy Review, Report by the Secretariat", 8 October 2018, WTO WT/TPR/S/381.

145 Ibid.



Box 17: Humanitarian Air Services in Nepal

The UN Humanitarian Air Services had completed 4,848 flights and airlifted 2,704 tonnes of humanitarian cargo by December 2015. These flights were carried out on behalf of 140 organizations comprising of NGOs, United Nations agencies, donors, government counterparts and other humanitarian partners, reaching some 155 destinations. The country's unique setting and the monsoon season made it challenging to deliver aid to many communities in Nepal's mountainous terrain, which were accessible only by air. Requests received for UNHAS services were 40 per cent higher than anticipated. As a result of the operation being air-access intensive, the UNHAS aircraft flew more hours than originally planned. There was persistent demand for air capacity and at the height of the response, more aircraft than initially planned were used.

Source: World Food Programme¹⁴⁶

426. As a landlocked country, Nepal is dependent on the transit of goods through India (mainly the port of Kolkata) to international markets. This imposes significant transport costs and delays on Nepalese exporters.¹⁴⁷ The economic effects of the disruption of essential supplies further highlighted the dependence of Nepal on transit transport links. As these disruptions dissipated, Nepal's exports to India are also recovering. Exports to China have seen robust growth but still comprise only 5 per cent of total exports, while exports to India account for 60 per cent. Hence, even a smaller growth of exports to India provides a greater thrust on overall improvement in exports.
427. Nepal and India have concluded various bilateral treaties: the Treaty of Transit, Treaty of Trade, Railways Services Agreement, and Agreement of Cooperation to Control Unauthorized Trade. The Transit Treaty allows Nepal to trade with other countries through the Kolkata/Haldia ports and, since 2016, Vishakapatnam. The revised Treaty of Trade with India, signed in October 2009, replaced its 1991 predecessor. According to Article XII of the Treaty, it is automatically renewed every seven years, unless one of the parties informs the other to the contrary. Under the Treaty, Nepal and India accord each other unconditional MFN treatment, and a mutually agreed list of primary products are exempt from customs duties and quantitative restrictions on a reciprocal basis. Industrial products from Nepal are given (non-reciprocal) access to the Indian market, free of customs duties and quantitative restrictions.¹⁴⁸
428. Trade and investment relations with China has significantly grown in recent years. In the first eight months of FY 2017/18, Chinese investors constituted 28.7 per cent of the total number of industries that got approval for foreign investment. China is Nepal's second largest trading partner.
429. Bilateral trade relations with Bangladesh gained momentum after the operationalization of Kankadbhitta-Phulbari-Banglabandh transit route, and over the years Bangladesh has increasingly been an important trade partner of Nepal. Nepal is working together with Bangladesh to enhance trade cooperation, including power trade and to narrow down trade imbalances. Nepal also participates in two overlapping regional agreements: The South Asian Free Trade Area (SAFTA) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC); and in 17 bilateral agreements.

¹⁴⁶ "Provision of Humanitarian Air Services in Nepal, Standard Project Report 2015", World Food Programme Available at: <http://www1.wfp.org/operations/200849-provision-humanitarian-air-services-nepal>.

¹⁴⁷ "Nepal, Trade Policy Review, Report by the Secretariat", 8 October 2018, WTO WT/TPR/S/381.

¹⁴⁸ Ibid.





Executive Summary – Dominica and Saint Lucia



DOMINICA AND SAINT LUCIA

Executive Summary

Hazards and Macroeconomic Impacts

430. Dominica and St. Lucia are vulnerable to meteorological and geo-physical hazards. Meteorological risks include high winds, excess rainfall, hurricanes and drought. Earthquake and tsunami risk are common to both islands, with Dominica facing also volcanic activity.
431. Hydro-meteorological disasters inflict significant economic damage, resulting in substantial decreases in GDP growth and productivity. For St Lucia, average annual losses from meteorological events amount to approximately 3.4 percent of GDP, with a storm equivalent to more than 61 percent of GDP expected once every 100 years. Hurricane Tomas in 2010 caused economic damage estimated at 43% of Saint Lucia's GDP. In Dominica, successive storm events damaged the equivalent of 90 percent of GDP (Tropical Storm Erika) in 2015 and an estimated 226% of GDP (Hurricane Maria) in 2017. The historical record shows that Dominica suffered multiple meteorological events in the same season in 13 of the 45 years that hurricanes struck over the period 1886-1996. Climate change predictions suggest that meteorological events of this nature may become more frequent and intense.
432. During national consultations held in August 2018, significant concerns were raised about the macroeconomic impacts of natural disasters. In the view of the IMF, the cumulative effects of Tropical Storm Erika and Hurricane Maria have reversed progress made in debt management and placed Dominica at a high risk of debt distress. Hurricane Maria has exerted pressure on Dominica's trade balance. Dominica's merchandise trade deficit has widened from just under EC\$100 million to close to EC\$ 250 million.

Trade Issues in Disaster Response

433. Trade facilitation issues emerged strongly from both national consultations. In Dominica, a combination of physical damage, limited storage space and procedural shortcomings created major difficulties in managing the surge in container traffic as disaster relief arrived. Some stakeholders reported waits of six weeks or more before landed containers could be released. With imports accounting for more than 50% of GDP, private sector representatives were quick to underline the criticality of port functions. In Dominica, they pointed to critical shortages of equipment, materials and labour (both unskilled and skilled) in the aftermath of Hurricane Maria. Government respondents highlighted how distinct the experience of Hurricane Maria was in comparison with that of Tropical Cyclone Erika, as well as the sudden onset of the more powerful category five Hurricane Maria.

434. Approaches to the exemption of import tariffs, other charges and duties, and sales tax on relief goods were discussed at length and evoked strong views among private sector operators, notably in Dominica. How lists of relief items are established, the charges that are exempted, the duration of exemptions and quantitative restrictions on private actors were among issues raised. Distinctions were made in relation into relief organizations, households and commercial operators. A concern raised in both Dominica and St. Lucia was how to distinguish between relief and regular commercial imports. Consideration was also given as to how implementation of WTO Trade Facilitation Agreement disciplines might address some of these issues.
435. Suggestions made included *ex ante* consideration of exemption lists in advance of hurricane seasons, a move that could lead to more strategic consideration of such issues as the inclusion of safety equipment in the list of duty exempted items. The obligation to seek approval from the Caribbean Community's Council for Trade and Economic Development (COTED) was highlighted in relation to non-application or amendment of the CARICOM Common External Tariff (CET). Concerns were raised in relation to non-automatic import licences for some items useful in disaster response, such as chainsaws.
436. Coordination issues were noted in relation to relief organizations operating outside the Caribbean Disaster and Emergency Management Agency established Regional Response Mechanism. Regional cooperation was evident in the response to Hurricane's Irma and Maria. For example, St Lucia had acted as a logistics hub for relief assistance for Dominica. Further supporting regional solidarity (e.g. through temporary secondment of customs officers) was a further suggestion made to alleviate human resource constraints in the aftermath of major disasters.

Trade Issues in Disaster Recovery

437. Economic output in Dominica is projected by the IMF to drop by 14 percent in 2018 and will take around 5 years to recover to pre-hurricane levels. Private sector representatives expect Erika and Maria to accelerate underlying structural trends by further shrinking manufacturing activity and fuelling growth in services, notably tourism. Policymakers on both islands asserted the importance of fiscal incentives in retaining systemically important firms. Experiences with DCP and Ross Medical School were cited as cases in point.
438. Even though not directly impacted by Hurricanes Maria or Irma that struck the region in 2017, private sector representatives in St. Lucia highlighted trade destruction and diversion effects from disruption to regional transport systems, notably express courier and maritime transport services. Opportunities had also been created in construction services and



- through the diversion of cruise ship tourism from traditional routes.
439. The cruise segment of the tourist market demonstrated considerable resilience, returning to growth quickly with the start of a new tourist season. In contrast, the overnight stay sector in Dominica has been far slower to recover – delays in receiving insurance payments and an inability to refinance debts have put a brake on recovery and raised worries about a crowding out of smaller operators. The rapid pay-out of claims through CCRIF system was praised, but recommendations made also for a significant expansion of the payments and coverage. Repatriation of foreign nationals was an area of concern identified by tourism sector operators as in need of future consideration given the increasingly decentralized nature of tourist operations.
440. At a sectoral level, agriculture in both Dominica and St. Lucia has recovered the slowest from adverse meteorological events. Banana farmers in St. Lucia were still struggling with the after-effects of Hurricane Tomas (2010) when an outbreak of the soil-borne fungus black sigatoka further compounded their problems. Phytosanitary risks were noted as a complication in the recovery of the coconut sector in Dominica and as a constraint in regional trade in a product segment where both global and regional demand is strong. The decade-long route to recovery in Grenada's nutmeg production was cited as a salutary example of the time needed for tree crops to cover. The forestry sector more broadly was identified as a sector where limited domestic capacity in management and processing constrained inherent value being realized with many commercially valuable downed trees left in situ or disposed of as waste. Refuse disposal services was identified as an area where lessons could be learnt in a review of the response to Irma and Maria. Fisheries was another sector negatively impacted.
442. Import tariff policy can influence the cost of hardening infrastructure. Experience in Dominica underscores how steel and cement demand slow when tariffs are high. Insurance coverage, notably for the private sector and of public assets, could be facilitated by further market development. Both private sector and government participants suggested that hydro-electric power would be a development and trade game-changer, reducing the cost of electricity and stemming the drain of foreign exchange on diesel imports. Business continuity planning was mentioned as another area for both firms and government.
443. The role that weather forecasting services can play in disaster resilience and reduction was recognized, together with their potential for efficiency gains in key sectors e.g. tourism through targeted marketing and predictions (e.g. of sargassum blooms). Improved physical protection of data and the use of cloud storage services were considered as actions to support resilience.

Introduction

444. Since 1950, 324 disasters have hit the Caribbean, killing 250,000 people and affecting more than 24 million through injury and loss of homes and livelihoods. The economic cost of these disasters for the Caribbean is substantial, exceeding \$22 billion (in constant 2009 dollars) between 1950 and 2016, compared with \$58 billion for similar disasters globally. (IMF 2018).¹⁴⁹
445. The Caribbean is one of the most disaster-prone regions in the world. The six member¹⁵⁰ countries of the Eastern Caribbean Currency Union (ECCU) rank in the top ten most disaster-prone countries in the world when considering disasters per land area or percentage of population. Vulnerability to frequent natural hazard events has resulted in affected Caribbean countries incurring very high economic costs to replace damaged or destroyed infrastructure. For Caribbean countries, losses from natural hazards have risen from 0.9% of GDP per year in the 1980s and 1990s to 1.3% of GDP in the 2000s. Moreover, the effects of natural hazards on growth and debt are also significant. (Caribbean Development Bank (CDB) 2014).¹⁵¹
446. For some countries, the damage incurred well exceeds the size of the economy; Hurricane Maria is estimated to have cost Dominica 225 percent of its GDP, while the hurricane damage for Grenada in 2004 was 200 percent of GDP, leaving reconstruction needs that can take years to fulfil. Climate change is expected to compound the problem by making

Trade Issues in Disaster Resilience

441. The intention of the Dominican government to become the first climate resilient nation is recognition of the need to break the cycle of periodic disasters and debt distress. A do-nothing policy, in the view of the IMF, will deliver dramatic negative economic outcomes, with large permanent losses of capital, output, and growth. Building resilience is necessary not only to reduce the human, social, and economic costs associated with climate and natural disasters, it is also a way to exit the vicious circle of natural disaster and subsequent high public debt.

149 "Bracing for the storm: For the Caribbean, building resilience is a matter of survival", March 2018 Inci Ötoker and Krishna Srinivasan, International Monetary Fund. Available at: https://www.researchgate.net/publication/323664225_Bracing_for_the_Storm_For_the_Caribbean_building_resilience_is_a_matter_of_survival.

150 Antigua and Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines.

151 "Caribbean Development Bank Strategic Plan 2015-2019", December 2014, Caribbean Development Bank. Available at: https://www.caribank.org/sites/default/files/publication-resources/BD-Paper_StrategicPlan_2015-19_Final_For_PublicDisclosure-Final.pdf.



such disasters more frequent and severe. (IMF 2018).¹⁵²

447. Disasters have large and enduring economic effects that range from lost income to the destruction of physical and human capital, infrastructure, and property. Rebuilding provides a temporary boost, but indirect effects can spread throughout the economy and undermine investment, growth, and macroeconomic performance. Debt dynamics inevitably worsen as governments borrow to finance recovery and growth slows. (IMF 2018).¹⁵³

448. An analysis of 12 Caribbean countries with the largest damage costs relative to GDP since 1950 supports this view. Although most countries experienced reduced growth in the year of a disaster, they recovered in the subsequent year. But fiscal deficits increased in 7 of 12 countries, current accounts deteriorated, and debt-to-GDP ratios surged. In some, debt continued to rise, suggesting that exposure to frequent disasters interrupts efforts to sustain strong growth and improve public finances. If these countries could reduce disaster damage, they might generate significant growth dividends and find their way out of the vicious cycle of high debt and low growth in which many are currently trapped. (IMF 2018).¹⁵⁴

449. Estimates of economic impact are difficult to quantify, not only because of rapid changes in global climate change projections but also because of the limited climate model projections at suitable spatial scales available for the Caribbean, and the weak inventory of the region's environmental resources and assets.¹⁵⁵ Various studies have given estimates of 5-30% (annualised values) of GDP. However, even taken at the low end of the range (in absolute terms), the impact of climate change is expected to be detrimental to long-term growth and development. (CDB 2014).¹⁵⁶

450. The poorest and most vulnerable citizens suffer the most from natural disasters and climate-induced events. Ending poverty will therefore require building resilience to climate change and associated events. It has been estimated that every dollar spent to reduce risk saves at least four dollars in future relief and rehabilitation costs. (CDB 2014).¹⁵⁷

451. Two sequential Category 5 hurricane systems, Irma and Maria, struck the Caribbean between the fifth

and twelfth of December 2017 resulting in multi-island impacts. Irma became a category 5 hurricane in the Western Atlantic Ocean on 5 September 2017 with maximum sustained winds near 185 mph. It impacted Anguilla, Antigua and Barbuda, The Virgin Islands (BVI), Dominica, St. Kitts and Nevis, Montserrat the northern districts of Haiti, Turks and Caicos Islands and the south-eastern islands of the Bahamas. A combination of strong winds, storm surge and intense rainfall, resulted in the loss of forty lives and significant damage to homes, critical infrastructure and other sectors throughout the affected islands. (CDEMA 2017).¹⁵⁸

452. Whilst Hurricane Irma was still active, Hurricane Jose, a Category 3 cyclone, posed a threat to the Northern Leeward Islands but fortunately did not result in any impacts. However, the threat posed by Jose immediately following the impact of Irma, triggered the Government of Antigua and Barbuda to evacuate the population of Barbuda. Maria became a category 5 hurricane near the Leeward Islands on 18 September 2017. It rapidly progressed from a tropical depression to a major hurricane (Category 3) within 48 hours and, subsequently to a catastrophic hurricane (Category 5) eight hours later impacting Dominica at approximately 9:35 pm on September 18th, with wind speeds of 155 mph. It then impacted St. Kitts and Nevis, Antigua and Barbuda and The Virgin Islands (BVI) between September 19 and 20 2017. (CDEMA 2017).¹⁵⁹

453. To examine the economic and trade impacts of the September 2017 hurricanes, research visits were conducted to Dominica (27-28 August) and Saint Lucia (29-30 August). In Dominica, a programme of consultations was organized by the Ministry of Trade Energy and Employment. A total of 23 persons and organizations were consulted (Appendix 1). In Saint Lucia, a programme of consultations was organized by the Ministry of Commerce, Industry, Investment, Enterprise Development and Consumer Affairs. A total of 22 persons and organizations were consulted, including the Organization of Eastern Caribbean States (Appendix 1). Meetings were also held in Barbados with five Caribbean regional organizations (1 September). Additional desk research was undertaken by the consultant to supplement insights offered by respondents. The authors also wish to acknowledge the support offered by the Geneva office of the Organization of Eastern Caribbean States.

152 "Bracing for the storm: For the Caribbean, building resilience is a matter of survival", March 2018 Inci Ötöker and Krishna Srinivasan, International Monetary Fund. Available at: https://www.researchgate.net/publication/323664225_Bracing_for_the_Storm_For_the_Caribbean_building_resilience_is_a_matter_of_survival.

153 Ibid.

154 Idem.

155 Caribbean Development Bank "Climate Resilience Strategy 2012-2017 Available at: https://www.caribank.org/sites/default/files/2018-07/BD23_12Rev1TA-Paper_Climate-ResilienceStrategy_FINAL.pdf.

156 "Caribbean Development Bank Strategic Plan 2015-2019", December 2014, Caribbean Development Bank. Available at: https://www.caribank.org/sites/default/files/publication-resources/BD-Paper_StrategicPlan_2015-19_Final_For_PublicDisclosure-Final.pdf.

157 Ibid.

158 "Rapid Review of the Regional Response in the Hurricanes Irma and Maria Events", October 2017, Caribbean Disaster Emergency Management Agency (CDEMA) Available at: https://www.cdema.org/Rapid_Review_of_the_Regional_Response_-_Irma_and_Maria_Events_2017_Final.pdf.

159 Ibid.



454. The text that follows discusses in depth the experience of both Dominica and St. Lucia in relation to their exposure to natural hazards and experience of natural disasters; the macroeconomic and trade effects of these crises and trade issues arising in disaster response, disaster recovery and disaster resilience.

DOMINICA

Exposure to Natural Hazards and Experience of Natural Disasters

455. Tropical storms and hurricanes occupy a prominent place in Dominica's history. The earliest recorded deaths from a hurricane date back to 1567 (Fontaine 2003). Between 1886 and 1996, Dominica was hit by 61 storms in 45 separate years, of which 21 were hurricanes. The two most powerful hurricanes recorded were category 4 storms, Hurricane David in 1979 and Hurricane Lenny in 1999. In 13 of the 45 years that storms hit, there were multiple events, with each successive storm further exacerbating the damage from the previous occurrence (Table 13). For example, in 1979, Hurricane Frederick occurred only one week after the category 4 Hurricane David had damaged or destroyed 95% of the housing stock and left two-thirds of the population without food, water or electricity. (World Bank, ODI 2001)

456. Dominica is vulnerable to various natural hazards arising from meteorological events (high winds, excess rainfall, and hurricanes) and geophysical events (earthquakes, volcano, and tsunami). Damage is associated with excessive and prolonged rainfall, leading to flooding and landslides (Commonwealth of Dominica, 2015).¹⁶⁰ Furthermore, historically the Dominican economy has incurred tremendous costs resulting in substantial decreases in GDP growth and productivity from hydro-meteorological disasters. The average economic losses caused by extreme hydro-meteorological disasters accounted for approximately 7.5% of GDP from 1990 to 2002 (Hamelin and Epstein, Global Climate Risk Index 2013).

457. The combined impact of Hurricane David in 1979, followed closely by Hurricane Frederick and then by Hurricane Allen in 1980, was particularly devastating. Real GDP plummeted by 17% in 1979, whilst agricultural GDP alone fell by 32% and non-agricultural GDP declined by 8.3%. Hurricane David also resulted in the temporary exodus of almost 20,000 people, equivalent to about a quarter of the pre-disaster (1978) population.¹⁶¹ Hurricane Dean

in 2007 resulted in damages which accounted for 58% of GDP (US 162 million) as well as substantial damages to infrastructure (Commonwealth of Dominica, 2015).

458. Due to steeply sloping topography, economic activities and human settlement are highly concentrated along narrow coastal areas. Therefore, a large proportion of population and assets are highly exposed to hurricanes, high-intensity rainfall, wind, and storm surges. Due to the island's topography, physical infrastructure is vulnerable to disasters. This vulnerability is partly attributed to the failure to address natural hazard risks in constructing infrastructure or to deferring maintenance (Commonwealth of Dominica, 2015).¹⁶²

459. In 2011, for example, record level flooding and landslides associated with heavy rain caused in excess of US\$100 million in damage. In 2013, heavy rains caused landslides, flooding and a 40-foot deep split along a section of the East Coast main road resulting in two deaths. Also in 2013, heavy rainfall caused extensive landslides, falling rocks, and flooding with restoration and rehabilitation works estimated at US\$18 million. (Climate Investment Funds (CIF 2015).¹⁶³

460. In 2015, flooding caused by Tropical Storm Erika damaged the equivalent of 90 percent of GDP (EC\$1.3 billion, US\$483 million). The majority of damage was incurred in the transport sector (60%), followed by the housing sector (11%) and agriculture sector (10%) (Commonwealth of Dominica, 2015).

160 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdrr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

161 Charlotte Benson, Edward Clay, Franklyn V. Michael, Robertson, Alastair W. Robertson. 2001. Dominica: natural disasters and economic development in a small island state (English). Disaster risk management working paper series; no. 2. Washington, D.C.: The World Bank. <http://documents.worldbank.org/curated/en/875391468770118094/Dominica-natural-disasters-and-economic-development-in-a-small-island-state>.

162 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdrr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

163 "Climate Resilience in Dominica", Final Report on the Progress of Dominica's Strategic Program for Climate Resilience and Annual Monitoring" June 2015 https://www.climateinvestmentfunds.org/sites/cif_enc/files/meeting-documents/dominica-2015_ppcr_results_report.pdf.



Table 13: Geophysical and meteorological events impacting Dominica (1979 – 2013)

Date	Event	Impact	Date	Event	Impact
2013 Dec 24	Trough, flash flooding and landslides	Damage to housing and infrastructure	2003	Seismic activity north	
2013 April	Heavy rains, 30+ landslides across the country	Damage to roads and agriculture	2001	Drought	
2013 Sept 5	Landslide Morne Prosper	Roads blocked	1999 April	Landslides in the north 100+	Damage to roads and housing
2011 Jul 29	Landslide Soufriere	Roads blocked	1999	Hurricane Lenny	Coastal Damage
2011 Jul 28	Miracle Lake flooding (ayou)	Damage to ecosystem, agriculture, fisheries and road network	1998 to 2000	Seismic activity in the south	
2011	Storm Ophelia	Damage to housing and infrastructure	1997	Landslide Bagatelle	
2010-2011	Severe Drought and extended rainy season of 2010	Loss of income in agricultural sector	1995	Hurricane Luis	Damage to housing, agriculture and infrastructure
2010 May 24	San Sauver Landslide	Disaster Zone	1995	Hurricane Marilyn (Cat 1)	Damage to housing, agriculture and infrastructure
2009 Jul	Flooding	Damage to infrastructure	1995	Hurricane Iris	Damage to housing, agriculture and infrastructure
2008	Hurricane Omar	Damage to coast and fishing industry	1989	Hurricane Hugo	
2007	Hurricane Dean (Cat 2)	Damage to agriculture and housing	1988	Hurricane Gilbert	
2007	Landslide Campbell		1986 Nov 11	Landslide Good Hope	
2007	Landslide		1986 Nov 12	Landslide Castle Bruce	
2007 Nov 29	Earthquake (6.5 Richter Scale)	Housing Infrastructure	1984	Hurricane Klaus	
2004 Nov 21	Earthquake	Damage to churches and housing in the north	1983	Landslide Bellevue Chopin	
2004 Nov	Series of landslides		1980	Hurricanes Frederick & Allen (Cat 1)	Economy Agriculture
2003	Carholm landslide	Damage to agriculture and Tourism	1979 Aug 29	Hurricane David (Cat 5)	Total devastation
2003	Landslide Bellevue Chopin				

Source: PDNA 2017



461. In response to Tropical Storm Erika, the Government decided not to declare a state of emergency, but identified nine special disaster areas. [Katafono,2018].¹⁶⁴ At the time that Erika struck, reforms were under way for public debt consolidation and to meet the target of 60 per cent debt to GDP by 2020. However, with the impact of the

storm, and weaker recovery prospects, there was concern that additional public debt consolidation measures before 2021 could be counterproductive, particularly if consolidation crowded out investment for reconstruction. [Katafono,2018].¹⁶⁵ Table 14 below provides an overview of damage and losses incurred from Tropical Storm Erika in 2015.

Table 14: Summary of Damage and Loss Caused by Hurricane Erika in 2015 (in Millions)

Sectors	Damage US\$	Loss US\$	Total US\$
Productive	71.07	17.13	88.2
Agriculture, Fisheries and Forestry	42.46	4.87	47.33
Tourism	19.48	11.70	31.18
Industry & Commerce	9.13	0.56	9.69
Infrastructure	283.48	51.07	334.55
Water and Sanitation	17.14	2.38	19.52
Air and Sea Ports	14.90	0.08	14.98
Roads and bridges	239.25	48.28	287.53
Electricity	2.19	0.33	2.52
Telecommunications	10.00	0.00	10.00
Social	48.72	11.36	60.09
Housing	44.53	9.61	54.15
Education	3.55	0.45	4.00
Health	0.64	1.30	1.94
Total	403.28	79.56	482.84

Source: Government of Dominica¹⁶⁶

462. Category 5 Hurricane Maria hit Dominica on 17 September 2017. The storm struck at a time that the government was preparing relief supplies for other Caribbean islands affected by the passage of Hurricane Irma. Hurricane Maria was one of the most rapidly intensifying storms in recent history, intensifying to a category 5 hurricane, roughly 24 hours after being upgraded from a tropical storm.

crops, infrastructure, equipment, and croplands, was affected. Furthermore, high winds and intense rainfall damaged the forest system [Commonwealth of Dominica, 2015].¹⁶⁷ Table 15 below provides an overview of damage and losses.

463. Hurricane Maria provoked damage estimated at 226% of GDP. Some 1.8 million work days were lost across tourism, agriculture, and commerce. Commerce and the micro-business sector suffered damage to the tune of US\$ 70.4 million. Damage and losses in the agriculture sector were substantial. Agricultural production including

¹⁶⁴ "Comparative Analysis of Disaster Risk Reduction and Management in Dominica and Vanuatu: Lessons for Small States", Small States Digest, No. 2018/01, Commonwealth Secretariat, London, <https://doi.org/10.14217/6f77cc82-en>.

¹⁶⁵ Ibid

¹⁶⁶ "Rapid Damage and Impact Assessment, Tropical Storm Erika 27 August 2015", A Report by the Government of the Commonwealth of Dominica", 25 September 2017, ACP-EU Natural Disaster Risk Reduction Program. Available at <https://www.gfdrr.org>.

¹⁶⁷ "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdrr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

Table 15: Summary of Damage and Loss Caused by Hurricane Maria in 2017 (in Millions)

	Damages US\$	Losses US\$	Total US\$	Needs US\$
Productive Sector	177.95	202.49	380.44	188.52
Agriculture	55.27	124.37	179.64	88.46
Fisheries	2.41	0.5	0.5	2.54
Forestry	29.72		29.72	14.87
Commerce and Micro Business	70.4	6.85	77.25	73.01
Tourism	20.15	70.77	90.92	26.19
Social Sector	444	42	486	638
Housing	353.96	28.5	382.46	519.75
Education	73.98	3.21	77.19	94.2
Health	10.9	6.95	17.85	22.14
Culture	5.07	2.91	7.98	4.67
Infrastructure Sector	306	135	441	509
Transport	182.15	52.62	234.77	302
Electricity	33.18	32.94	66.12	80.68
Water and Sanitation	24	39.73	63.73	56.26
Telecommunication	47.74	8.31	56.05	47.84
Airports and Port	18.89	3.26	22.15	22.67
Cross-Cutting	3	1	4	13
Disaster Risk Management	3	0.8	3.8	10.22
Environment				1.78
Gender				0.79
Total	931	380	1,311	1,368

Source: Government of Dominica, 2015¹⁶⁸

Trade Impacts and Issues

Meeting with Rt Hon Minister Douglas, Minister of Trade, Dominica

464. During a courtesy call on 26 August 2018, the Minister highlighted damage to the agricultural sector, the backbone of the Dominican economy, caused by Hurricane Maria. He outlined direct losses in terms of production destroyed and some

of the difficulties faced in re-establishing trade relationships. Damage had been compounded by the destruction of two multi-purpose pack houses that were used for the export of fresh fruit and vegetables. The loss of these facilities was a major impediment for export recovery. Nevertheless, root crops had proven resilient, notably dasheen, ginger, potatoes and yams. In January 2018, only four months after the hurricane, inter-island ginger exports had restarted.

168 Idem.



Box 18: Hurricane impacts on Dominica's agriculture sector

Agriculture, and specifically crops, play a dominant role in the Dominican economy. The sector's contribution to GDP has been increasing and reached 10.5% in 2013. Dominica's non-banana crops include plantains, citrus fruits, root crops, vegetables, herbs and spices. The sector employs approximately a third of the labour force and is an important source of foreign exchange earnings. The sector operates in a very challenging local and global climate. Locally challenges include relatively high cost of production; low labour productivity resulting in "supply-side" constraints and an ageing farmer population. Globally the sector faces preference erosion and increased competition in traditional markets.¹⁶⁹

The Government has improved the quality management system through the construction of modernised infrastructure such as a Banana Inland Reception and Distribution Centre, two Packing Houses, and a Centre for Testing Excellence. New legislation related to the exportation of fresh produce was enacted in 2009. The Animals Act, the Plant Protection and Quarantine Act, and the Pesticides Act have also been revised and the revisions were pending enactment in 2014.¹⁷⁰

Damage and losses sustained in the agriculture sector were extensive, affecting all aspects of agricultural production including crops, infrastructure, equipment and croplands. Livestock damage includes 45 percent of cattle, 65 percent pigs and over 90 percent chickens with an estimated value of EC\$ 8.68M (US\$3.21M). Crop losses were similarly high with respect to basic foodstuffs such as root crops, vegetables, banana and plantain where crop destruction ranged from 80 to 100 percent. Total estimated damage and losses to crops is estimated at EC\$ 350.6M (US\$ 129.9M) Much of the agricultural infrastructure and equipment was damaged or destroyed including buildings, animal husbandry facilities, agricultural roads and croplands.¹⁷¹

Source: WTO, Government of Dominica

465. Minister Douglas highlighted that the start of the new school year (September 2018) would be a big test for the government and the return to normality. Significant efforts had had to be deployed to repair school buildings and to source new text books. A shift system had been established in the aftermath of Hurricane Maria so that school buildings still able to function would be able to host multiple schools and so ensuring that children were not left outside of the academic system.

466. Discussing the clearance of fallen trees, Minister Douglas noted that legal protection for the forests made commercial saw mills uneconomic. Local saw mills had closed down prior to the passage of Hurricane Maria as the volume of trees that could be sourced from local forests was not sufficient to maintain the industry. In the aftermath of Hurricane Nevin, forest had been replanted for ecological, not commercial use. In the aftermath of Hurricane Maria, lumber was being sourced from Guyana at 0% duty.

467. Minister Douglas highlighted that Dominica's "Citizenship by investment" scheme had been unaffected by hurricane disruption. Transactions continued using this IT services platform. He also highlighted the Government's target to become climate resilient and the positive trade effects. Dominica was investing in geothermal power systems. Such underground infrastructure was not as susceptible to wind damage as overhead cables driven by diesel generators that were also

a drain on foreign exchange. The prospect of green energy exports to neighbouring Martinique and Martinique by mid-2021 would provide a big boost to the economy and balance of payments position. Commitments had been made from various donors in this regard. The meeting closed with reference to the proposal made by the OECS at the WTO's 11th Ministerial Conference in Buenos Aires (MC11).

Overview of the Macroeconomic and Trade Effects of Crises

468. A narrow economic base, exposure to natural disasters and a high reliance on imports make the OECS-WTO Members vulnerable to exogenous shocks. The global financial crisis coupled with natural disasters in the region adversely impacted economic growth. Real GDP for the OECS contracted by nearly 10% between 2009 and 2010 before recovering slightly in 2011, and contracting again in 2012.

469. The contraction in GDP was due mainly to a decline in the tourist arrivals from North America and Europe, as well as lower per capita expenditure. Furthermore, the OECS-WTO Members were affected by financial sector problems in the region, including the collapse of the CL Financial Group (Trinidad and Tobago), which had a contagion effect on the OECS through its subsidiaries CLICO and BAICO. Antigua and Barbuda's financial sector was particularly hit by the collapse of two local banks and a large offshore banking institution. Mainly

169 Trade Policy Review Report by OECS- WTO Members, 18 September 2014, WT/TPR/G/299/Rev.1, World Trade Organization.

170 Ibid.

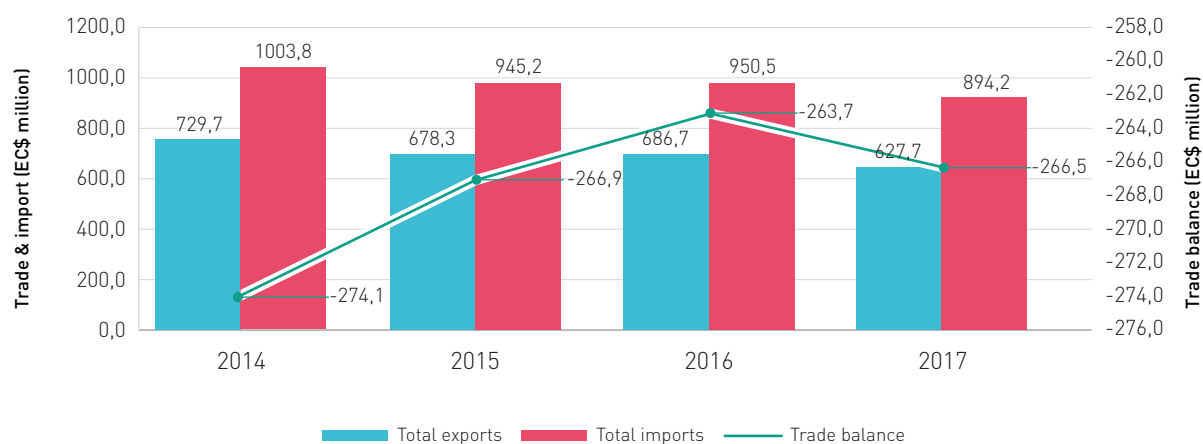
171 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

supported by increased services exports, GDP growth rebounded somewhat in 2013, when an estimated collective real growth rate of 1.2% was posted.¹⁷²

470. Dominica's susceptibility to natural disasters is visible in change to trade indicators in the aftermath of the passage of the 2015 Tropical Cyclone Erika and 2017 Hurricane Maria. Both

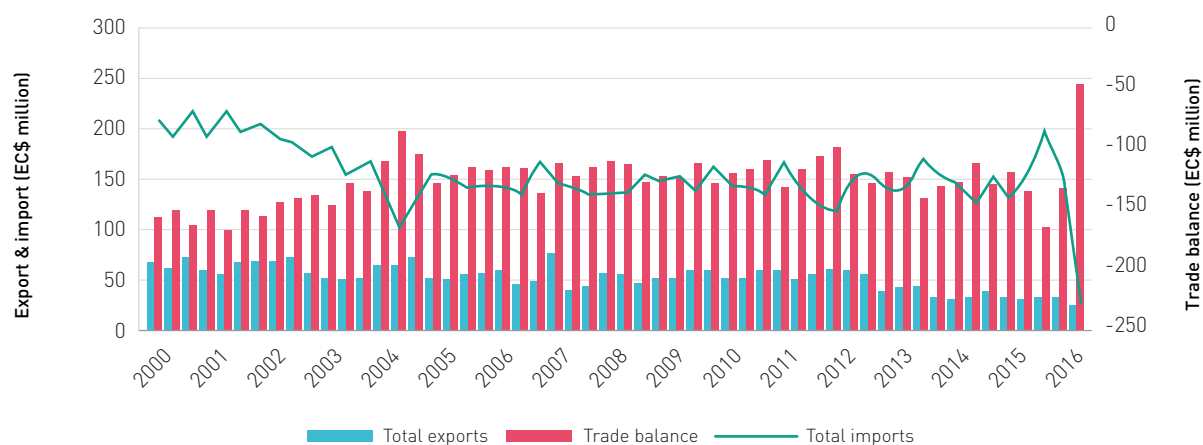
events put pressure on Dominica's trade balance. Estimates for the first and second quarters of 2018 show a continuously downward trend in exports and a further, large increase in imports. Surpluses in trade in services have been unable to offset a growing deficit in trade in goods. Improvements in the fiscal position prior to the 2017 disaster have thus been reversed, with the trade deficit again starting to grow. (See Figure 21: Trends in Dominica's trade and trade balance.)

Figure 21: Trends in Dominica's trade and trade balance



Source: WTO computation based on data from the Eastern Caribbean Central Bank.

Figure 22: Trends in Dominica's merchandise trade and trade balance

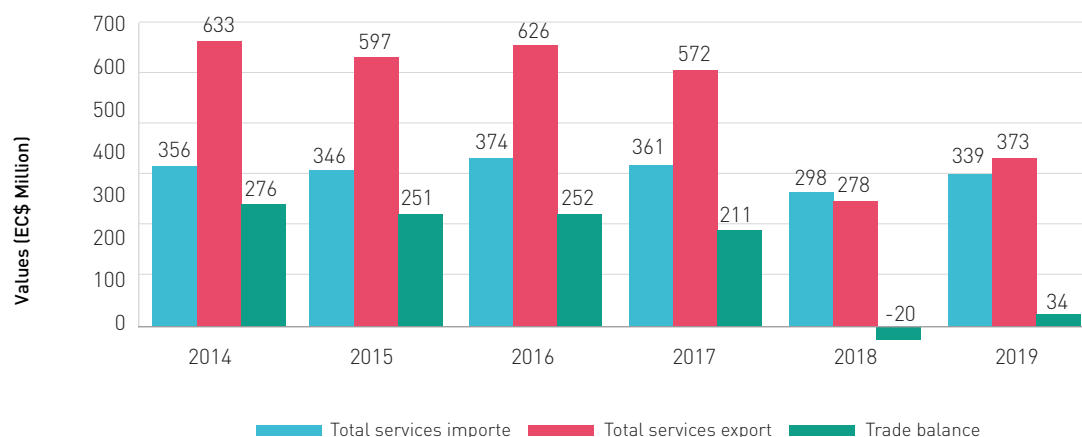


Source: WTO computation based on quarterly data from the Eastern Caribbean Central Bank.

471. Figure 22 highlights the impact of Hurricane Maria on Dominica's merchandise trade balance. In the aftermath of Hurricane Maria, the merchandise trade deficit has widened from just under EC\$100 million to close to EC\$ 250 million.

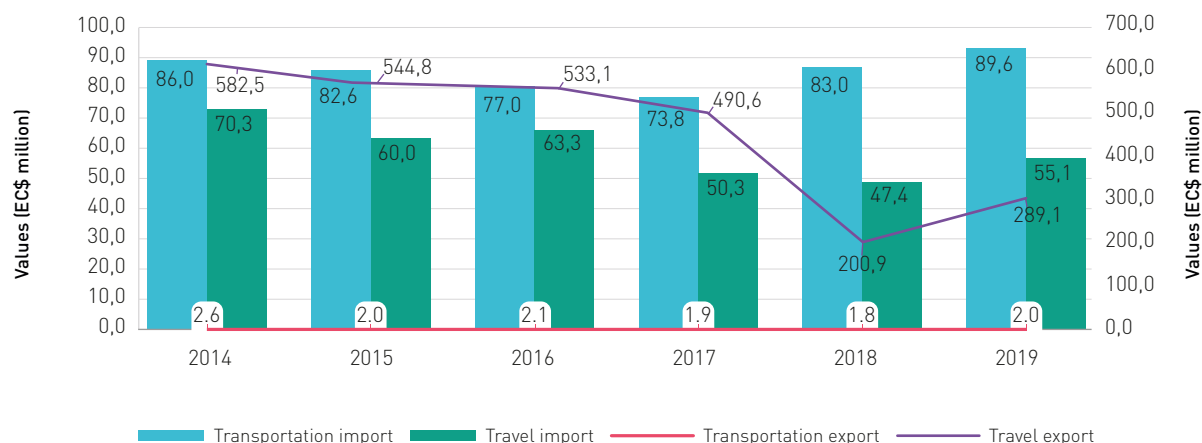
172 "Trade Policy Review, Report by the Secretariat: OECS-WTO Members", 22 September 2014, WT/TPR/S/299/Rev.1.

Figure 23: Dominica and Trade in Services 2014-19



Source: WTO computation based on data from the Eastern Caribbean Central Bank Note: Figures for 2016 are preliminary, while figures for 2017 and 2018 are estimates and projections.

Figure 24: Dominica and transport and travel services 2014-2019



Source: WTO computation based on data from the Eastern Caribbean Central Bank. Note: Figures for 2016 are preliminary, while figures for 2017 and 2018 are estimates and projections

472. Figure 23 and Figure 24 further highlight that the 2017 hurricane also strongly affected trade in services. In 2018, the Eastern Caribbean Central Bank (ECCB) is projecting a decrease in both the import and export of services, with a resultant services trade deficit in the order of EC\$20 million. A small trade surplus in services is projected in 2019.

473. Hurricane Maria affected some specific sectors such as the transport and financial services which support the manufacturing and agricultural sectors. Based on the projections of the ECCB, the import of services related to the transport sector will increase by 17% from EC\$77 million in 2016 to approximately EC\$90 million in 2019, while export will remain virtually unchanged. Foreign exchange from travel will reduce by 46% from EC\$533 million

to EC\$289 million with travel imports falling by 13% from EC\$63million to EC\$55 million.

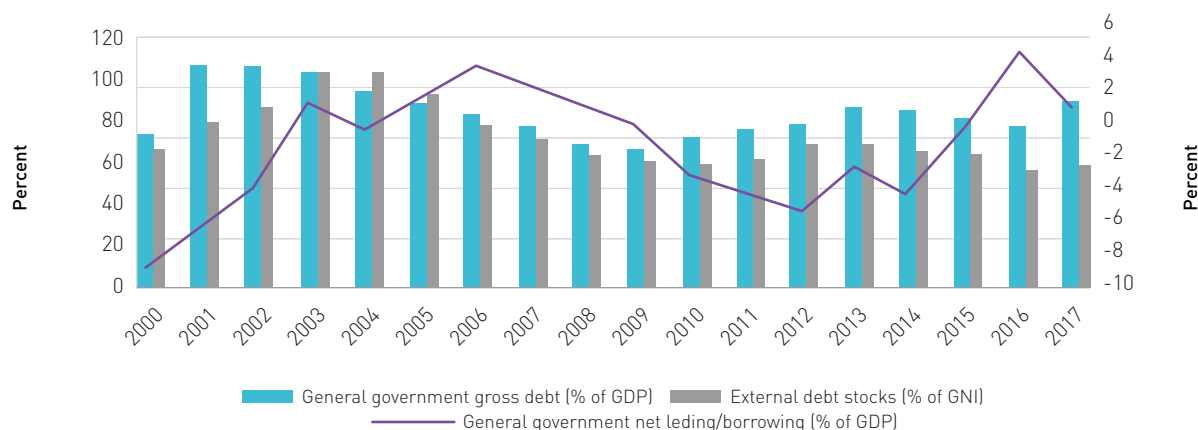
474. The value of construction services is expected to increase 62% by 2019 from its 2016 value of EC\$4.3 million. This is an indication of increased demand for construction services and materials for infrastructural development in the post hurricane recovery period.

475. Tropical storm Erika and Hurricane Maria represented a significant set-back for the government's efforts to bring external debt under better control. Dominica's debt had fallen from a high of 100 per cent of GDP in mid-2000s to around 63 per cent in 2009, following a large fiscal adjustment and debt-restructuring programme that was supported by two International Monetary Fund (IMF) programmes during 2002–2006. In

the years before Hurricane Erika, the Dominican Government had reinvigorated efforts towards debt consolidation and was undertaking various reforms

to meet the Eastern Caribbean Currency Union public debt target of 60 per cent of GDP by 2020. [Katafono, 2018].¹⁷³

Figure 25: Trends in Dominica's debt indicators



Source: WTO computation based on data from the World Bank and IMF

476. According to IMF predictions, output was projected to drop by 14 percent in 2018 and to take about 5 years to recover to pre-hurricane levels. The fall in output and government revenue, coupled with increased expenditure for rehabilitation and reconstruction, will lead to a substantial worsening of fiscal and external deficits. Given high debt, limited buffers, weak revenue, and urgent needs for reconstruction spending, the budget could become financially constrained and unable to sustain adequate investment. (IMF 2018).¹⁷⁴ Table 16 below gives the IMF's predictions for the economy of Dominica out to 2023.

477. After Hurricane Maria on September 18, 2017, exports of goods and services collapsed (falling 32%) due to severe damage, notably to agriculture and tourism infrastructure. Imports and transfers increased by 7.5% due to post-hurricane reconstruction needs and higher external support, respectively. Given projected increases in imports for reconstruction and decreased Citizenship-By-Investment (CBI) revenue, the current account deficit is expected to increase further to 31.7 percent of GDP in 2018, then decline from 2019. (IMF 2018).¹⁷⁵

478. The impact of the hurricane presents Dominica with severe sustainability challenges, compounded

by systemic financial risk. The output collapse and the costs of reconstruction will lead to large fiscal and current account deficits. Public debt is expected to rise near 90 percent of GDP with the identified financing, increasing fiscal and external sustainability challenges. In light of the high debt burden and the significant risks to the debt sustainability outlook, Dominica is assessed at a "high risk of debt distress." IMF 2018.¹⁷⁶

479. The World Bank approved a financing package of US\$115 million over 3 years, of which US\$75 million are IDA credits and the remainder, IDA grants. The Caribbean Development Bank (CDB) is considering topping up an undisbursed US\$50 million loan with US\$40 million from its Special Development Fund as well as US\$0.2 million in grants. Other sources, including bilateral grants and loans, are expected to total US\$111 million. (IMF 2018).¹⁷⁷ Assistance in the immediate response to Hurricane Maria included air and marine support from Canada, the European Union, the Netherlands UK, and Venezuela, and the private sector entities such as LIAT and Tropical Shipping. (CDEMA 2018).

¹⁷³ "Comparative Analysis of Disaster Risk Reduction and Management in Dominica and Vanuatu: Lessons for Small States", Small States Digest, No. 2018/01, Commonwealth Secretariat, London, <https://doi.org/10.14217/6f77cc82-en>.

¹⁷⁴ Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

¹⁷⁵ Idem.

¹⁷⁶ Idem.

¹⁷⁷ Idem.

Table 16: Projected economic and financial indicators for Dominica, 2014-23

	Projected									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Output and prices										
Real GDP 1/	4.2	-3.7	2.6	-4.7	-14.1	9.4	6.8	3.6	2.3	1.5
Nominal GDP 1/	3.9	1.3	8.7	-4.1	-12.9	11.2	8.7	5.5	4.4	3.2
Central government balances										
Revenue 2/	27.1	31.5	47.1	46.8	37.0	34.8	27.8	27.2	27.3	27.3
Expenditure	31.7	32.4	43.3	46.1	41.0	38.9	36.2	34.2	26.3	26.5
Primary balance	-3.0	1.0	5.4	2.0	-2.1	-2.3	-6.6	-5.2	2.9	2.6
Overall balance (incl. ND cost buffers), of which:	-4.6	-0.9	3.8	0.7	-5.5	-5.6	-9.9	-8.5	-0.5	-0.7
Central government debt (incl. guaranteed) 3/	78.7	75.3	71.7	82.7	87.7	83.3	86.1	87.8	87.1	85.2
External	61.0	58.1	54.7	66.0	71.1	68.1	72.8	75.8	75.7	74.7
Domestic	17.7	17.1	17.1	16.7	16.6	15.2	13.2	12.1	11.4	10.5
Balance of payments 4/										
Current account balance, of which:	-7.1	-1.9	0.8	-12.5	-31.7	-22.1	-20.4	-21.3	-14.2	-11.9
Exports of goods and services	51.6	50.1	48.3	42.6	33.2	41.4	44.2	43.4	43.7	43.7
Imports of goods and services 5/	63.4	58.8	54.0	67.2	83.1	81.0	75.7	70.3	61.5	58.5
External debt (gross) 6/	83.7	86.5	77.9	88.8	99.6	95.6	99.7	101.9	102.2	101.0
Net imputed international reserves: End-year (millions of U.S. dollars)	99.9	125.4	220.9	210.9	210.7	208.9	206.5	202.1	210.6	215.3
Months of imports of goods and services	3.6	4.8	8.4	6.8	6.3	5.7	5.6	5.6	6.4	6.6
Saving-Investment Balance										
Saving	7.6	14.3	20.0	10.8	-6.3	-1.0	-2.2	-6.7	-5.0	-6.0
Investment	14.8	16.2	19.2	23.3	25.4	21.1	18.2	14.6	9.2	5.9

Sources: Dominican authorities; Eastern Caribbean Central Bank (ECCB); and Fund staff estimates and projections.

1/ At market prices.

2/ Data for fiscal years from July to June.

3/ Includes estimated commitments under the Petrocaribe arrangement with Venezuela.

4/ BoP data prior to 2014 are compiled on BPM5 basis and revised to conform with BPM6 methodology but are not fully comparable.

5/ Includes public capital expenditure induced imports from 2019 onwards to account for possible mitigation of natural disasters.

6/ Comprises public sector external debt, foreign liabilities of commercial banks, and other private debt.

Source: IMF 2018 ¹⁷⁸

178 Idem.



Box 19: World Bank support for Dominica

On 13 April 2018, the World Bank's Board approved two emergency support operations totalling US\$65 million for restoring agriculture livelihoods, strengthening resilience, and rebuilding houses destroyed by Hurricane Maria. This represents the World Bank's highest ever financing for Dominica and was part of a larger US\$115 million package of support that included financing of US\$65 million in concessional terms and US\$50 million in grant financing from the International Development Association's (IDA) Crisis Response Window.

The Emergency Agricultural Livelihoods and Climate Resilience project (US\$25 million) will help farmers and fisherfolk to restore their agriculture and fishing production and systems, and adopt climate smart practices. The Housing Recovery project (US\$40 million) will focus on rebuilding houses and improving the application of resilient building practices. The financing for these projects includes the US\$ 50 million of grant financing.

In the immediate aftermath, the World Bank mobilized a disaster risk management team to help the Governments of the most affected islands, Antigua and Barbuda and Dominica, to conduct rapid damage and needs assessments, in collaboration with the United Nations, the European Union, the Eastern Caribbean Central Bank, the Caribbean Disaster Emergency Management Agency and the Caribbean Development Bank. At the same time, US\$7 million contingent emergency response component of an existing emergency project was immediately activated for Dominica.

In the Caribbean, many financial tools developed by the World Bank are being used to get quick access to finances for reconstruction. These include emergency funds, insurance instruments, and contingency lines of credit. Eight countries have received pay-outs of more than \$50 million from the Caribbean Catastrophe Risk Insurance Facility, a regional risk pooling mechanism. Dominica received a pay-out of US\$19.3 million after Hurricane Maria.

Source: World Bank¹⁷⁹

480. Over 400 high-level representatives from governments, multilateral and civil society organizations and the private sector gathered at UN on 21 November 2017 at the "CARICOM-UN High-level Pledging Conference: Building a more Climate-Resilient Community" to mobilise a broad partnership to support reconstruction efforts after hurricanes Irma and Maria decimated several Caribbean Countries. Support included over US\$1.3 billion in pledges and over \$1 billion in loans and debt relief.

481. Responding to the urgent needs, over US\$1.35 billion were pledged by established partners and new ones, Estimated amounts: \$702 million from The Netherlands; \$352 million from the European Union; \$140 million from the World Bank; \$78 million from Canada; \$30 million from China; \$27 million from Mexico; \$12 million from Italy; \$4.3 million from the United States; \$4 million from Japan; \$1 million from Kuwait; \$2 million from India; \$1 million from Venezuela; \$1.2 million from Belgium; \$1 million from Chile; \$500,000 from Denmark; \$300,000 from Colombia; \$250,000 from Haiti; US\$ 250,000 from New Zealand; \$200,000 from Brazil; \$150,000 from Kazakhstan; \$100,000 from Romania; \$100,000 from Portugal and \$20,000 from Serbia. Moreover, the Inter-American Development Bank pledged US\$1 billion in loans, Italy, \$30 million in soft loans while Venezuela forgave \$1 million in debt.¹⁸⁰

Meetings with Public and Private Sector Stakeholders

482. On 27-28 August 2018, the WTO research team held a series of consultations with public and private sector stakeholders. The following section relates the main issues arising from the consultations, organized according to trade issues arising in disaster response, disaster recovery and disaster resilience. Issues identified in the consultations are supplemented with information from other sources on the same topics.

Trade Issues in Disaster Response

483. Initial challenges in coordination of relief were reported with the international humanitarian community at the national level. This impacted the response efforts in the early stages of the operations. Information on the bilateral efforts at regional and extra-regional levels were not always shared in time to allow for leveraging to support for ongoing operations through the Regional Response Mechanism (RRM) thus not allowing for a full lens on how the total humanitarian needs were being met. (CDEMA 2017)

484. Many humanitarian organisations without knowledge or experience of the region and its mechanisms and procedures for emergency management arrived and started relief operations

¹⁷⁹ World Bank Press Release, 'World Bank Provides US\$65 million for Dominica's Post-Maria Reconstruction' (April 13, 2018). Available at <https://www.worldbank.org/en/news/press-release/2018/04/13/world-bank-provides-us65-million-for-dominicas-post-maria-reconstruction>.

¹⁸⁰ "Caribbean can only 'build back better' with international support and urgent climate action, UN, CARICOM Chiefs and Heads of Government", 22 November 2017, Resilient Caribbean Conference, <https://resilientcaribbean.caricom.org/caribbean-can-only-build-back-better-with-international-support-and-urgent-climate-action-un-caricom-chiefs-and-heads-of-government/>.



without reference to the governments or RRM. Though well-meaning, this support resulted in a duplication of efforts. This was also true of some staff of humanitarian entities practicing in the region. The difference in understanding of systems, capacities and roles at the outset of the operations created coordination and trust issues. The efforts to streamline and respond to the demands of the external actors for logistical support became a burden to the local system. Once the mechanisms for integrating the international humanitarian actors in the local system, through sector level or thematic focus areas, the reinforcement of local capacity was better realized. (CDEMA 2017)

485. In Dominica national emergency management actors and local authorities were heavily impacted themselves which affected their coordination capacity. The extensive loss of the communications infrastructure in Dominica and the Virgin Islands created major constraints in the RRM operations in coordination, relief planning, logistics and reporting. (CDEMA 2017)
486. The Dominican Air and Seaports Authority (DASPA), suffered damages to its assets. The ports of Dominica serve as the main cargo entry point for all trade, and the island's economy survives by importing nearly all goods. The port of Woodridge Bay, close to Roseau, is the only container port on Dominica, and is the only entryway for large machinery, large shipments of merchandise and refrigerated food items. Since Dominica is not really served by any passenger aircraft belly cargo capacity, except for dedicated cargo flights, the ports of Dominica are the only way critical imports can enter the country. (Commonwealth of Dominica, 2017).¹⁸¹
487. Public services and transport were severely affected in light of the damage sustained by electricity and, water and sanitation infrastructure. As of end-

April 2018, the electricity company reported that, while most generation and transmission facilities been repaired, their load was 40 percent of pre-hurricane levels because many consumers had not rebuilt their properties sufficiently to restore consumption. (IMF 2018).¹⁸²

488. Debris management was identified by CDEMA as a major challenge in all of the states impacted by the September 2017 hurricanes. The regional military assisted in debris clearance, working at night in Dominica, thus enabling more rapid clearing of debris. At the close of operations, the country will be faced with the challenge of disposing of large quantities of plastic waste from bottled water, used tarpaulins and packaging of relief items, as well as expired medication and other unsolicited and unusable relief supplies. One recommendation is to include debris management and environmental sustainability considerations in national disaster management plans. Such considerations should also be included in the plans of humanitarian organisations. (CDEMA 2017)
489. The shipping sector losses are comprised of two elements: (1) loss of traffic, some of it due to infrastructure damages; and, (2) a government moratorium on charges for non-commercial activity. Since most of the port's shipments are now related to the relief and rebuild efforts after Maria, revenues are 25 percent of the baseline, indicating a 75 percent revenue loss. There is no income from cruise ships since there is no infrastructure to receive them. (Commonwealth of Dominica, 2017).¹⁸³
490. One issue reported by stakeholders was congestion at the main port outside Roseau. The port sustained significant physical damage and struggled to manage the post-hurricane surge in shipments — which jumped from an average of 80 containers per week to a peak of 300 containers per week. (IMF 201).¹⁸⁴

Box 20: ICT infrastructure

Several organizations and groups reported providing emergency communications to Dominica, including the **ITU**, **Telecomms Sans Frontier**, **Emergency Telecommunications Cluster**. The extensive damage to telecommunications infrastructure and the slow restoration by service providers raises questions of the robustness of the infrastructure. It was not clear which service providers had equipment and which locations suggesting the need for better information on the location and status of critical facilities.

Source: ITU¹⁸⁵

181 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

182 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

183 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

184 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

185 International Telecommunications Union, *Assessment of Emergency Telecommunication Plans and systems in the Caribbean Region*, December 2017. Available at https://www.itu.int/en/ITU-D/Regional-Presence/Americas/Documents/ACTVTS/DLV/ITU_Assessment_ET_Caribbean.pdf.



Box 21: Steel toe-capped boots

In the wake of Tropical Storm Erika in 2015, the Dominican government had planned to reduce tariffs on certain safety items to improve health and safety within the building sector. This change had been meant to take effect on 1 October 2017. In the aftermath of Hurricane Maria on 17 September, a list of goods, and approved organizations for full or partial duty exemption, was devised. Safety equipment, such as steel toe capped boots, were not included in the list of products for tariff exemptions. A point made strongly by a representative of the Waterfront and Allied Workers Union was that the port was an unsafe working environment in the aftermath of the hurricane. Extending business operations in this dangerous situation entailed serious health and safety risks for dock workers.

Source: National consultations, Roseau, 27 August 2018

491. A mixture of physical hurricane damage, limited storage space and procedural shortcomings appear to have created a major issue with border clearance of containers. Stakeholders reported waits of six weeks or more before landed containers could be released. Stacking of relief items and regular commercial trade together allied to storage constraints led to difficulties in physical tracking and recovery of containers that rapidly surpassed the physical limits of the port. A further concern that arose was with the return of empty containers. A build-up of empty containers further aggravated physical space constraints.
492. Private sector stakeholders at the national consultation stressed that there is a critical link between the port and the ability of business in Dominica to operate. In regular times, the Dominican economy is import dependent, with imports accounting for 56.2% of GDP in 2017.¹⁸⁶ Machinery and material imports were required to remove physical waste generated by the Hurricane and to replace damaged business assets before economic activity could commence. Examples were given in relation to agro-processing, furniture manufacturing, paper products, power generation, telecoms, and the hotel and hospitality sector. Against this backdrop, various private sector respondents considered port operations as a critical bottleneck to recovery.
493. The decision not to extend working hours or to streamline documentation requirements and procedures was a point of contention for some private sector operators. Another issue cited was that customs clearance could only be completed once duties and charges had been settled in full. The financial distress of firms, in particular micro, small and medium-sized enterprises (MSMEs), in the immediate aftermath of the hurricane meant many struggled to find the necessary funds to finance imports. In the view of some, settlement of import charges in full at the time of importation added further to their financial distress felt.
494. Several comments were made by the private sector in relation to policies on the exemption of relief, commercial and privately imported items from border duties and charges. A first retroactive decision on relief consignments was issued by Cabinet Decision on 5 October 2017. This Decision was updated and the list of conditions varied by subsequent Decisions issued on 19 October, 7 November, 14 November, 21 and 27 March 2018. Table 17 below outlines the list the items eligible for waiver of some or all duties and charges on 8 November 2017.
495. Concerns raised by private sector stakeholder focused on an absence of information about the duration of the waivers in the initial government decisions, legal uncertainty as to their scope (e.g. did the waiver apply when the good was ordered or landed), mandatory registration for VAT rebates and the complexity of administering a system of partial exemptions for commercial imports – complications which further delayed the release of containers.
496. At the national consultation, a vigorous complaint was made by an eco-lodge owner who had ordered paint from a non-CARICOM supplier when this item was zero rated for tariff purposes and whose consignment had been delivered after the expiry of the waiver. The lodge owner had had to settle an import bill in excess of 135% of the value of the paint itself – an unforeseen cost he could ill afford.
497. Some private sector stakeholders suggested that a prior agreement on an approved list of emergency relief goods to be tax/duty exempted would speed up quick response and recovery in future situations. A word of caution was noted here by some in relation to the differing degree of damage incurred by Tropical Storm Erika (in which the government had been able to procure locally and use prepositioned stocks to cover needs) and Hurricane Maria, (which combined with acts of looting, had inflicted far more serious damage to commercial stocks and transport infrastructure).

186 Imports of goods and services as % of GDP, Dominica 2017, World Bank Open Data, <https://data.worldbank.org/>.



Table 17: List of items eligible for duty exemptions

List or relief items on which import duty, value added tax, customs service charge and environmental surcharge were exempted on transfers between organizations	List of commercial imports on which import duty and value added tax were waived, but customs service charge and environmental surcharge maintained	
<ul style="list-style-type: none"> • Foodstuff • Clothing • Linen • Mattresses (three per household) • Toiletries • Domestic refrigerators (one per household) • Domestic stoves (one per household) • Water pumps • Generators (one per household but a permit from IRC is needed for generator more than 20,000 KVA) • Portable air conditioning units (limited to business houses, companies and agencies) • Chainsaws • Tarpaulins 	<ul style="list-style-type: none"> • Building blocks or bricks • Cement • Lumber • Plastic tiles • Ceramic tiles • Panels • Partition boards • Ceiling tiles • Galvanize sheets and capping • Plastic guttering • Steel rods • PVC pipes • Electrical conduits and fittings • Steel tubes and pipe fittings • Copper tubes and pipe fittings • Taps and faucets • Valves 	<ul style="list-style-type: none"> • Plastic sanitary baths • Sinks • Lavatories • Wash basins • Aluminium, Plastic, Steel and Wooden windows and doors • Aluminium, Plastic and Steel water tanks • Nails and screws • Electricals (lamp fittings, bulbs, switches, fuses, junction boxes, plugs, connectors) • Locks • Hinges • Water heaters • Paint • Vanish • Solar panels

Source: Dominica News¹⁸⁷

498. A further complicating factor for customs was damage to information technology systems at a time when the customs administration was migrating to an updated customs classification code. One reason for a lack of data for maritime vessel calls after Maria is because data could not be completed in the normal computerized format, due to the destruction of offices and the related IT technology. (Commonwealth of Dominica, 2017).¹⁸⁸ Damage to airport scanners and other clearance equipment was also incurred. Table 13 below shows the revenue loss of the waivers over the period 20 September 2017 to 20 June 2018 which totalled some US\$18.8 million or EC\$50.8 million in Eastern Caribbean dollars.

499. The 2014 Trade Policy Review of the Organization of Eastern Caribbean States (OECS) highlighted the dependence of OECS states on taxes on foreign trade, the application of specific duties, import licences and price controls.¹⁸⁹ Dominica ratified the Trade Facilitation Agreement (TFA) on 28 November 2016. Just over 50% of commitments have been

notified in category A (i.e. they entered into force on the entry into force of the TFA on 22 February 2017). Provisions related to the implementation of Trade Facilitation Measures for Authorized Operators were notified under category B, with an indicative date for implementation of 31 December 2019 and definitive date for implementation of 31 December 2021. Other provisions were notified in category C for which technical assistance is being sought, with implementation dates depending on the provision and the requested support.¹⁹⁰

187 "Government Waives import duties on relief items", 8 November 2017, Dominica News Online. Available at: <http://dominicanewsonline.com/news/homepage/news/general/govt-waives-import-duties-on-relief-items/>.

188 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdrr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.

189 "Trade Policy Review, Report by the Secretariat: OECS-WTO Members", 22 September 2014, WT/TPR/S/299/Rev.1.

190 https://www.tfadatabase.org/uploads/notification/NDMA1_3.pdf.

Table 18: Revenue Forgone from Duty Exemptions in Eastern Caribbean Dollars

Period	Cost Insurance Freight value	Import Duty Other	Environmental Surcharge	Customs Service Charge	Excise Tax	Value Added Tax	Total Forgone
20/09/17 to 19/03/18	122,035,436	21,386,503	243,399	649,379	1,064,441	21,764,162	45,107,883
20/03/18 to 20/06/18	43,530,613	4,348,231	8,756	23,408.29	10,239	1,349,326	5,739,961
Total	165,566,049	25,734,734	252,155	672,787	1,074,680	23,113,488	50,847,844

Source: Government of Dominica

Trade Issues in Disaster Recovery

500. Output is projected to fall by over 14 percent in 2018, largely due to the steep decline in agriculture and tourism services. Based on sectoral assessments, the IMF projects that output should recover to pre-hurricane levels within 5 years, although it could take longer. The IMF identify several factors as holding back recovery: restoring electricity services; weak port logistics capacity delaying importation of construction materials; insufficient labour for reconstruction, particularly workers with specialized skills; under-insurance of the private sector and slow pay-out of claims; limited access to private financing due to the fall in household and investor income after the hurricane. (IMF 2018).¹⁹¹
501. Some stakeholders at the private sector consultation also pointed to competition between domestically-produced goods and relief goods distributed to the population by aid agencies as unhelpful. In contrast to the situation post Tropical Storm Erika, few relief items were sourced locally, even when stocks existed and local suppliers were keen to recommence trading. Examples were given by a bottled water supplier and paper products manufacturer. Both companies noted that markets were heavily disrupted by the arrival of disaster relief in first four months after Hurricane Maria, but that competition effects lasted upwards of nine months before normal market conditions returned.
502. Several participants at the consultation noted the use of an aid voucher scheme by UNDP and UNOCHA that could be used to purchase goods. While welcoming the scheme, some highlighted the limited stock of essential items (such as food and medicine) in local markets in the aftermath of the Hurricane Maria – a situation aggravated by business looting in the aftermath of the hurricane. In the opinion of some participants, care needed to be taken in relation to the sequencing of a move from aid in the form of goods to aid in the form of cash.
503. Several stakeholders highlighted that there was a shortage of materials and equipment immediately after Hurricane Maria. Additionally, there was a lack of labour, both unskilled and skilled. The private sector had needed to recruit labour and services from companies overseas. At that time, the issue was how to accelerate importing processes of labour, especially skilled labour, such as medical doctors. The cost of importing this labour was considered high by some respondents.
504. For some businesses, the challenge of recovery from Hurricane Maria was further complicated by the fact that many were still suffering the effects of the 2015 Tropical Storm Erika when Maria struck in 2017. A case in point is that of Dominica Coconut Products (DCP Ltd) at Belfast, home to Colgate Palmolive's product lines and the island's leading manufacturing employer. Tropical Storm Erika caused serious damage to the soap and detergent manufacturing plant. Flooding breached sea-defence walls invading the compound with surges exceeding six feet in the various buildings and offices, ruining machinery and supplies.¹⁹² On 30 November 2015, Colgate Palmolive announced the closure of the DCP plant, with the loss of more than 90 jobs.¹⁹³
505. In view of the importance of DCP's operations for manufacturing capacity and foreign exchange, the Government of Dominica acquired DCP Ltd from Colgate Palmolive in late 2015. In August 2017, DCP restarted operations in private hands after the government provided a US\$2 million loan to a local investor using funds generated through the Citizenship by Investment (CBI) Program.¹⁹⁴ Unfortunately, Hurricane Maria inflicted further

191 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

192 "Impact of Tropical Storm Erika on Dominica – The Private Sector Glance, 6 November 2015, OECS Business Focus No. 10" Available at: <http://oecsbusinessfocus.com/impact-of-tropical-storm-erika-on-dominica-the-private-sector-glance/>.

193 "Dominica Coconuts Products shuts down operations", 19 November 2015, The Dominican.net.

194 "Dominica government moves to takeover local Colgate-Palmolive operations", 22 November 2015, Caribbean 360 Available at: <http://www.caribbean360.com/news/dominica-government-moves-to-takeover-local-colgate-palmolive-operations#ixzz5ZGg5GM3w>.



damage on the firm, notably to the jetty used to receive inputs used in manufacturing operations such as tallow.¹⁹⁵ Nevertheless, the firm has continued operations and is selling soap and

detergent products in Dominica and across the region. Box 22 below details fiscal incentives available for manufacturing investment.

Box 22: Fiscal incentives available for manufacturing investment

Businesses involved in Manufacturing can enjoy a 15-year tax holiday benefit and other incentives under the Fiscal Incentives Act. The Government of Dominica offers a generous fiscal incentive package for investment in this area:

- Tax holiday up to 15 years;
- 100% profit repatriation;
- Import duty exemptions on capital goods
- Machinery & equipment, specialized vehicles, safety equipment, building.

Source: Invest Dominica Authority¹⁹⁶

506. A further example of a business that decided to shutter operations in Dominica in the aftermath of extreme weather is Ross University School of Medicine. On 3 August 2018, (i.e. some 11 months after the passage of Hurricane Maria), the medical school announced it planned to relocate to a new campus on Barbados. Ross Medical School first established operations on Dominica in 1978. The Government and Adtalem Global Education (the owner of the Ross Medical School) had reached a 25-year agreement in 2014 that came with a wide range of concessions, including redevelopment of the campus. The University reported a student population of more than 2,500 students.

507. In the Caribbean, offshore medical universities (OMUs) target students that are mostly non-Caribbean, and intend to practice medicine in North America. Most OMUs offer dual-campus programmes, whereby the theoretical aspect is completed in the Caribbean while clinical clerkships are completed at teaching hospitals in the United States. In September 2017, there were one hundred and one medical universities in the Caribbean, offering programmes leading to an award of Bachelor/Doctor of Medicine and Bachelor of Surgery degrees. OMUs act, in effect, as a substitute for US medical universities and typically construct their degree programme based upon the US curriculum. Ross University School of Medicine was one of only four Caribbean schools to be recognized by the US Department of Education's National Committee on Foreign Medical Education and Accreditation as providing education that is equivalent to the US medical universities.¹⁹⁷

508. Stakeholders at the national consultation noted that there was no agreed figure for Ross' contribution to Dominica's GDP. Some participants placed the

figure as high at 15-20% of GDP, once the indirect economic benefits were included. A value chain analysis conducted by UNECLAC of Caribbean OMU's identified the following benefits for host country economies, including:

- Corporate and student taxes paid by the medical universities and their enrolled students;
- Income tax paid by the local faculty in the medical universities;
- Tariffs charged on imported products;
- Expenditure by students and faculty on accommodation, living expenses, and entertainment.
- Increased options to access medical education for some home country students.
- Increase in employment opportunity for some citizens of the host country. This increase could be linked to positive externalities related to the construction of medical universities, as well as the number of staff employed at the university in various professional categories.
- Provision of consumer services, such as taxi services, car rentals, accommodation rentals, hair grooming, cosmetic and beauty services, and recreational activities.

509. Hurricane Maria inflicted significant damage to Ross University School of Medicine campus, its buildings and infrastructure. The extreme weather event led to the evacuation off the island of students and faculty. Since then, the university had been obliged to operate from temporary locations

195 "DCP Successors procures \$2 million shipment of soap-making ingredients", 18 October 2018, Dominica New Online.

196 Available at: <http://www.investdominica.com/investment-opportunities/manufacturing-sector/manufacturing/>.

197 'A global value chain analysis of offshore medical universities in the Caribbean', Sheldon McLean, Don Charles, (January 2018), UNECLAC Sub Regional Headquarters for the Caribbean. Available at <https://www.cepal.org/en/publications/43311-global-value-chain-analysis-offshore-medical-universities-caribbean>.



in St Kitts and Nevis and Tennessee in the US while damage assessment, repair and rebuilding has occurred on the Dominic campus.¹⁹⁸

510. After discussion with the Government of Barbados, Adtalem Global Education decided to relocate Ross's operations to Barbados starting the academic year September 2018-2019. Significant efforts were made by the government to secure Ross's continued operation on the island, notably through the offer of additional incentives. In October 2018, the government reported that it was in preliminary discussions with potential investors to take over the site. Before a new lease can be agreed, an agreement needs to be reached with Ross Medical College on transfer of ownership of the buildings on the land it leased from the government.¹⁹⁹

511. During the consultation with the private sector, they welcomed government efforts to put in place financing through the Dominica Agricultural and Industrial Development (AID) Bank that firms could access in the wake of the Hurricane. However, a concern raised was that this funding could not be used to refinance existing debts – a factor which thus limited the ability of firms to assume new obligations and recommence trading. Hurricane Maria struck at a time when many businesses had taken on debt in preparation of a new tourist season. Some MSMEs reported that they had not been able to reopen their businesses due to lack of access to capital. According to one stakeholder, a survey conducted by Dominica Manufacturers' Association revealed that the manufacturing sector primarily needed assistance to access finance.

Box 23: Access to finance

The Dominica Agricultural and Industrial Development (AID) Bank is providing concessional financing for post-Maria recovery. It offers financing to government-identified sectors including agriculture, tourism, manufacturing, housing, and education. The Bank is funded primarily by multilateral institutions, including the Caribbean Development Bank. The central government also provides funds for on-lending to promote development and post-Maria recovery.

The AID bank asset portfolio was severely affected by Hurricane Maria. A preliminary assessment indicated that approximately 45 percent of properties in the AID-bank portfolio suffered physical damage, with the largest shares in agriculture (about 80 percent) and manufacturing (about 60 percent), and the lowest in housing (about 30 percent) and transportation (about 25 percent).

To help clients recover, the Bank granted a payment moratorium of 6 months to the agricultural sector and 4 months to other sectors. Non-performing loans had increased from 25 percent before the hurricane to 29 percent as at end-April 2018, with a further increase reportedly likely. Banks and credit unions are not expected to provide significant financing due to the deterioration of asset quality and household incomes after the hurricane – which exacerbated long-standing structural factors limiting access to credit.

Source: IMF²⁰⁰

512. Another factor limiting private sector recovery noted by the IMF and repeated at the national consultations was delay and uncertainty regarding insurance pay-outs. The IMF reported that 33 percent of claims, mostly property-related, were still outstanding in August 2018 – claims totalling approximately 15 percent of GDP. Similar concerns were expressed at the national consultation by private sector operators. A study conducted by the Dominica Hotel and Tourism Association of 20 properties – representing 276 exportable rooms or 30 percent of the pre-Maria room stock, revealed that eight months after the passage of Maria, some 75 percent of claims had not been paid out.²⁰¹
513. The IMF reports that many of the outstanding claims relate to the largest insurer, the sole domestic insurance company that held a large proportion of outstanding claims. This insurer had a capital shortfall equivalent to 2 percent of GDP and was seeking financial support to meet outstanding pay-outs. In the IMF's view, progress with claim payments since the hurricane had otherwise been significant, especially by foreign companies, with total payments made equivalent to 20 percent of GDP.²⁰²
514. Dominica has in place a traditional indemnity-type insurance cover and holds a sovereign catastrophe risk insurance cover under the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

198 "Adtalem Global Education Announces Barbados as New Location for Ross University School of Medicine", 3 August 2018, Available at <https://www.adtalem.com/newsroom/press-releases/adtalem-global-education-announces-barbados-as-new-location-for-ross-university-school-of-medicine>.

199 "Dominica PM hints at legal action against Ross University", 4 November 2018, Barbados Today. <https://barbadostoday.bb/2018/11/04/dominica-pm-hints-at-legal-action-against-ross-university/>.

200 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

201 "Insurance Payment Delays Hampering Rehabilitation Efforts of Tourism Industry", 23 May, 2018, The Dominica Sun. Available at: <http://sundominica.com/articles/insurance-payment-delays-hampering-rehabilitation--4787/>.

202 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.



Although Dominica's 1978 Constitution Chapter 5 (80) (Dominica Government 1978) and Finance [Administration] Act, 1994, Act 4 of 1994 (Part 111) (7) (Dominica Government 1994), makes provision for a Contingencies Fund, the Dominican Government has not included contingencies in its annual budget provisions. (Katafono, 2018) One recommendation made by the IMF is that the government should use its representation powers to advance harmonized regional regulation for the insurance sector, which would reduce insurance costs with the increase in scale, risk diversification, and competition.²⁰³ A further recommendation made by the IMF is that the Contingency Fund should be activated in future budgeting.

515. Dominica's market is open to "reinsurance services" according to the country's GATS schedule. It is possible to provide reinsurance services to Dominicans on a cross-border basis without a commercial presence. Dominicans can also subscribe to foreign based reinsurance companies without restrictions. Dominica's GATS schedule on insurance services notes several limitations for foreign reinsurance companies wishing to establish a commercial presence in Dominica (mode 3). Market access is subject to the "Insurance Act". In addition, foreign reinsurance companies must also pay a withholding tax. Foreign nationals wishing to work in the reinsurance sector in Dominica are subject to work permit and immigration regulations. The services schedule does not elaborate on these regulations, processes and requirements.
516. Consultations with the Caribbean Development Bank (CDB) indicated that it is supporting member countries to create a regional insurance market. The CDB highlighted that policy and legislation changes are needed so that insurance companies can diversify risks over different countries. Divergent tax and other regulations need to be addressed and CBD is collaborating with the Eastern Caribbean Central Bank toward this goal.
517. Box 24 below outlines the operation of the Caribbean Catastrophe Risk Insurance Facility CCRIF SPC made a payout of US\$19,294,800 to Dominica under its tropical cyclone policy following the passage of Hurricane Maria – a pay-out made within 14 days of the passage of the hurricane on 19 September 2017.²⁰⁴ CCRIF is designed to provide quick liquidity to governments of the Caribbean and Central America following catastrophic impacts from tropical cyclones, earthquakes and excess rainfall.
518. Participants at the national consultation in Dominica welcomed the speed of the CCRIF pay-

out, but suggested that the financial coverage of the Facility needed expanding in future so as to cover a greater proportion of damage incurred. This was a theme also touched on by Prime Minister Roosevelt Skeritt at the UN General Assembly in which he stated that "Though helpful, the amounts are usually grossly inadequate to rebuild infrastructure and to maintain the gains and progress made in economic and social development after the likes of Hurricanes Maria, and Irma or even in the case of a Tropical Storm like Erika. Substantially more funds must therefore be made available to vulnerable countries for loss and damage such that they may mitigate the risks associated with future incidents. Prime Minister Skeritt suggesting recapitalizing CCRIF for greater coverage by using already committed funds from the Green Climate Fund."²⁰⁵

519. The 2014 WTO Trade Policy Review of the OECS highlighted that Dominica's manufactured sector revolves mainly around agro-processing, some assembly of plastic and metal goods, and textile production. The agro-industry includes the production of beverages using a variety of raw materials, such as coconut, citrus, and other fruits. The main markets for Dominica's manufacturing exports are other OECS countries, Martinique and Guadeloupe.²⁰⁶
520. The direct effect of Hurricane Maria to the local agricultural economy can be categorized as the following, but not limited to: a) physical/ environmental impact (loss of bio-diversity, loss of a critical ecosystem services, dislocation of lands, transport and sedimentation of soil material, loss of crop canopy, feeder and farm access roads, damage to government infrastructures, etc.); b) economic impact (loss of foreign exchange, loss of market share, loss of income, increase in food import, increase production cost, impact on revenue, etc.); c) socio-economic impact (loss of farm employment and related agricultural activities, exit from sector, migration, urbanization and changing agrarian structure, etc.). (Commonwealth of Dominica, 2017).²⁰⁷

203 Ibid.

204 "CCRIF to Make Payout to Dominica of US\$19 million Following the Passage of Hurricane Maria", 22 September 2017, Caribbean Catastrophe Risk Insurance Facility website. Available at: <https://www.ccrif.org/news/ccrif-make-payout-dominica-us19-million-following-passage-hurricane-maria>

205 Available at: https://gadebate.un.org/sites/default/files/gastatements/72/dm_en.pdf.

206 Trade Policy Review Report by OECS- WTO Members, 18 September 2014, WT/TPR/G/299/Rev.1, World Trade Organization.

207 "Post-Disaster Needs Assessment Hurricane Maria September 18, 2017 – A Report by the Government of the Commonwealth of Dominica" 15 November 2017, Available at: <https://www.gfdr.org/sites/default/files/publication/dominica-pdna-maria.pdf>.



Box 24: Caribbean Catastrophe Risk Insurance Facility

CCRIF SPC is a segregated portfolio company, owned, operated and registered in the Caribbean. It limits the financial impact of catastrophic hurricanes, earthquakes and excess rainfall events to Caribbean and – since 2015 – Central American governments by quickly providing short-term liquidity when a parametric insurance policy is triggered. It is the world's first regional fund utilising parametric insurance, giving member governments the unique opportunity to purchase earthquake, hurricane and excess rainfall catastrophe coverage with lowest-possible pricing. CCRIF was developed under the technical leadership of the World Bank and with a grant from the Government of Japan. It was capitalized through contributions to a Multi-Donor Trust Fund (MDTF) by the Government of Canada, the European Union, the World Bank, the governments of the UK and France, the Caribbean Development Bank and the governments of Ireland and Bermuda, as well as through membership fees paid by participating governments. In 2014, an MDTF was established by the World Bank to support the development of CCRIF SPC's new products for current and potential members, and facilitate the entry for Central American countries and additional Caribbean countries.

CCRIF provided additional financial assistance under its Technical Assistance Programme for specific rebuilding projects on the island to help recovery efforts. Dominica has received more than USD 23 million through CCRIF in pay-outs since 2007. First in 2007 earthquake for USD 500,000, followed by Excess Rainfall (Tropical Storm Erika) in 2015 for USD 2.4 million, and most recently a Tropical Cyclone pay-out (Hurricane Maria) for USD 19.2 million in conjunction with an excess rainfall (Hurricane Maria) for USD 1.05 million.

According to the World Bank, there are a number of risk financing options that Dominica could explore to help manage natural disasters:

- **Sovereign disaster risk financing:** Development of financial strategies to increase the financial response capacity of governments in the aftermath of natural disasters, while protecting long-term fiscal balances
- **Property catastrophe risk insurance:** Development of competitive catastrophe insurance markets to increase property catastrophe insurance penetration among homeowners and small/medium enterprises
- **Agricultural insurance:** Development of agricultural insurance programs for farmers and agricultural financing institutions to increase their financial resilience to adverse natural hazards). Although insurance schemes are seen as an alternative strategy for risk reduction, for many who are unable to afford insurance, the strategy of choice is livelihood diversification (UNDP 2015).
- **Disaster micro-insurance:** Facilitate access to disaster insurance products to protect the livelihood of the poor against extreme weather events and promote disaster risk reduction, in conjunction with social programs such as conditional cash transfer programs (World Bank).

Source: CCRIF SPC, UNDP Assessment Capacities Project, World Bank²⁰⁸

521. A case in point as to how manufacturing in Dominica is tied back into the agriculture sector is the coconut sector. The coconut value chain contains five distinct product markets – outlined in Box 25 below. With domestic supply of raw material severely curtailed, all the segments of the coconut value chain in Dominica have been affected. Several of the private sector participants present at the national consultations had been obliged to shutter business operations in the absence of raw material supply. The Post-Disaster Needs Assessment conducted by the Government of Dominica estimated that 65 percent of coconut trees were damaged by Hurricane Maria, together with 80 percent of cocoa and 80 percent of citrus trees.

522. During the national consultation, stakeholders in the agriculture sector expressed concern that

recovery of tree crops would require a minimum of five to seven years before production began to approach pre-hurricane levels. In May 2018, the government announced plans to import 20,000 coconuts plants and 8,000 citrus plants, along with coffee and avocado plants.²⁰⁹ However, phytosanitary risks associated with the import of live plants led to a rethink at the behest of Dominica's phytosanitary authorities. Nor have imports of fresh coconuts, that could have been used by processors have been authorised.

523. Various plant diseases circulate in coconut trade. One example is Candidatus Phytoplasma Palmae, a phytoplasma disease commonly known as lethal yellowing of coconut, which spreads through the movement of coconut planting material. Once introduced, lethal yellowing disease attacks coconut trees and leads to premature fruit fall. The disease

208 "Dominica Lessons Learned from Tropical Storm Erika", October 2017, Assessment Capacities Project. https://www.acaps.org/sites/acaps/files/products/files/20171024_acaps_dominica_lessons_learned_tropical_storm_erika.pdf.

209 "Austrie says farmers are producing in the wake of Hurricane Maria", 10 May 2018, Dominica News Online. Available at: <http://dominicanewsonline.com/news/homepage/news/agriculture/austrie-says-farmers-are-producing-in-the-wake-of-hurricane-maria/>.



has been reported in Antigua and Barbuda.²¹⁰ Little information is available on phytosanitary risks in coconut trade and limited investment has been made in mapping of pests. As a result, trade is hampered by risk assessment processes and a lack of regionally harmonized protocols.

524. The Caribbean Coconut Industry Development Project, implemented by the International Trade Centre and the Caribbean Agricultural Research Development Institute with funding from the European Union is an on-going initiative to address these issues. The project works with 11 Caribbean countries, including Dominica, and is guided by a detailed mapping of regional and national coconut industry structures conducted in July 2016 (see Box 25 below). It has four dimensions which are highly relevant for the revitalization of the coconut sector in Dominica: productivity enhancement, reducing the impact of weather risks and natural

disasters, control of the presence of lethal yellowing disease and other pests, and addressing shortages in production of seedling and coconut planting materials.

525. Also, badly affected by Hurricane Maria was the forestry sector. Strong winds and the salty sea blast resulted in an almost complete defoliation of all trees. Only in protected valleys or on the leeward side of slopes did a small number of trees retain foliage. Damage was still visible when the research team visited in August 2018, along with visual evidence of the initial recovery that the Post-Disaster Needs Assessment predicted. The PDNA estimated that 10 to 20 percent of trees had been completely flattened, while another 50 percent or more were still standing and likely to recover within five years. The main use of the forest is for ecotourism. Forest cover is integral to the tourist branding of Dominica as the “Nature Island”.

Box 25: Expanding Global Coconut Value Chain

The coconut global value chain is at a critical juncture, characterized by a rapidly growing demand in global markets and a stagnant supply base in danger of collapse in origin countries. Market demand is rising for traditional and non-traditional coconut products across five different coconut value chain strands:

- In the coconuts-chemical chain, the traditional export product, coconut oil, is used as a feedstock in manufacturing oleochemicals. Consumer preference for ‘naturalness’ in personal care and cosmetic markets has expanded the demand for oleochemicals, which account for nearly 45-50% of coconut oil consumption worldwide
- In the coconuts-‘sports drink’ chain, coconut water grew to an estimated US\$1.36 billion market in 2014 and was projected to reach approximately \$4billion in 2019. Leading global brand manufacturers such as the Coca Cola Co., Pepsi Co. and Red Bull GmbH, as well as niche players such as Vita Coco have driven product and market development through their investment in coconut water products and brands.
- Growth in the ‘coconut-food’ chain is also driven by non-traditional products. ‘Alternative dairy food and beverage’ markets in the U.S. grew 25-30% per year during 2009-2014, with the coconut milk market reaching US\$193 million in 2014 and expected to grow at 18% per year to 2021. Exports of virgin coconut oil have grown manifold, reaching 7,300 tons in 2012.
- Coconut shell supplied approximately 19% of the feedstock in production of activated carbon, with an estimated global market value of US\$2.35 billion in 2014, and a projected market of US\$3.92 billion by 2019
- Coir, extracted from the coconut husk, has also become a widely used input in geotextile, horticulture, and recently as a natural fiber in composite applications. Husks are, however, still largely wasted and from the 5-6 million tons global supply, only 10-15% of the husk volume enters international commercial markets.

Since 2008, regional trade of coconuts and coconut products has grown by approximately 230%, reaching US\$8.6 million in 2014. An emerging coconut regional value chain -characterized by fragmented production networks involving vertically-coordinated trade between Caribbean countries --has driven regional and global trade expansion.

Limited supply of fresh coconuts is the critical constraining barrier to industry growth. The supply bottleneck is rooted in persistent low investment in now aging and unproductive coconut plantations following the decline of ‘copra oil’ oil industry in the 1980s. Regardless of the size of production, the structure of coconut farming is currently beset with poor organization, typically a smallholder activity concentrated in areas deprived of financial and technological resources. Only a more concerted intervention by the public-private stakeholders can feasibly divert the industry’s current course, set head-on towards a supply chain crash.

Source: International Trade Centre²¹¹

210 “First report of lethal yellowing disease associated with subgroup 16SrIV-A phytoplasmas in Antigua”, Myrie WA, Harrison NA, Douglas L, Helmick E, Gore-Francis J, Oropeza C, McLaughlin WA, 2014. New Disease Reports 29, 12. Available at: <http://dx.doi.org/10.5197/j.2044-0588.2014.029.01>.

211 “Connecting to the World Market through Regional Value Chains: Partnership Opportunities in Coconut Value Chain for the Small Caribbean Economies” July 2016, Ajmal Abdulsamad, Duke University, Centre on Globalization, Governance & Competitiveness, International Trade Centre Available at: https://gvcc.duke.edu/wp-content/uploads/ITC_Report_Caribbean_Coconut_Global_Value_Chain_2016.pdf “Connecting to the World Market through Regional Value Chains: Partnership Opportunities in Coconut Value Chain for the Small Caribbean Economies” July 2016, Ajmal Abdulsamad, Duke University, Centre on Globalization, Governance & Competitiveness, International Trade Centre Available at: https://gvcc.duke.edu/wp-content/uploads/ITC_Report_Caribbean_Coconut_Global_Value_Chain_2016.pdf.



526. Dominica does not have any large-scale forest operations. It is estimated that approximately 20 commercial trees species and dimensions per acre were blown over or destroyed by the Hurricane. The average royalty value of a tree is estimated to be EC\$140. Fallen trees represent a valuable resource forgone if they cannot be exploited. Two solutions proposed in the PDNA included charcoaling and conversion of fallen trees into lumber. Both solutions encounter trade issues however. For charcoal, the PDNA noted that a key problem was to find an export market in the Caribbean or further afield. For lumber operations, compliance with schemes to prevent illegal logging and certification for freedom from phytosanitary risks represent further obstacles. A more general point made at the national consultation was that such operations needed prior enabling frameworks, including through government procurement and authorization of foreign service providers. In the absence of domestic firms able to take on this task, temporary admission of foreign suppliers was one option discussed during the national consultation.
527. The fisheries sector in Dominica is "extremely vulnerable to hurricanes and storms". "There are no naturally secure harbours and fisheries infrastructure is squeezed in between the coasts and the sea. Consequently, capital losses are high in every major storm".²¹² Hurricane Maria was no exception. Approximately 128 vessels (or 40% of the total fishing fleet) were lost, fisheries cooperatives suffered damage to ice-making machines, fuel pumps and supplies for market vendors, and fishers lost a large percentage of their fishing gear. The Fisheries Division in Roseau lost its roof, furniture and office equipment. The destruction affected the food security and livelihoods of fisher folk and those in associated sectors (e.g., market vendors, gutters, mechanics, boat builders). The PDNA highlighted how restoring fishing operations would have positive spill-over effects on the coastal communities by means of supporting mechanics, boat builders, small and medium sized business as well as all household dependents.
528. Dominica's fishing industry is artisanal and small-scale, and consists of capture fishery and aquaculture that contribute four per cent to GDP. Most of the fish caught are used for subsistence or sold domestically. The Dominica fishery division interviewed during the national consultation indicated market access issues in entering Guadeloupe and Martinique for fish caught by Dominican boats due to sanitary measures. Fish could only be landed after transfer to vessels from these jurisdictions, reducing the economic return to Dominican fishers. Overall the fisheries sector employs approximately 2,200 people. Amongst the recovery needs identified in the PDNA were: refrigeration repairs to reinstate ice production and cold storage facility; rehabilitation of fisheries cooperatives; infrastructural work on fishing cooperatives and reinstating functions of fuel stations.
529. The tourism sector has driven economic growth in Dominica since 2009. Growing at 5.5% per year, tourism's share of GDP jumped from 15 percent of total GDP in 2009 to 23.9 per cent in 2016. The sector comprises distinct components, overnight stay and cruises. Cruises are more important in visitor numbers (276,000 of the 366,000 total visitors in 2016), while overnight stay generates more income for the country (with a spend of US\$406 per day for an average nine days as compared to EC\$89 for a one-day cruise stop-over).
530. Damage inflicted by Hurricane Maria and the difficulties faced by smaller operators, notably eco-lodges, in accessing financing and insurance payouts, raised concerns at the national consultation about a change in the structure of the sector. The heaviest damages were to hotel room stock of small operators. Out of a total of 909 rooms, 39 percent (358) were severely damaged, while a further 34 percent (308) were damaged, but expected to return progressively to the market within 12 months. With two new high-end resorts expected to come on stream by 2020, concerns were raised by some smaller operators about future opportunities and the economic benefits of tourism for Dominicans.²¹³ The sector is important from the perspective of women's economic empowerment. Women make up 60-70% of the labour force in the hotel sector and in some OECS countries tourism has twice as many women employees than other sectors.
531. Cruise tourism returned quickly to Dominica after investment in rehabilitation of the cruise berth in Roseau. By December 2017, cruise ship visits had returned to 20% of pre-hurricane levels. A total of 189 cruise calls are projected for the 2018-19 tourist season which equates to 304,000 cruise passengers, with nine new cruise ship visits. If realized, this would represent an increase of 28,000 or 10.1% over 2016 numbers.²¹⁴

212 Charlotte Benson, Edward Clay, Franklyn V. Michael, Robertson, Alastair W. Robertson, 2001. *Dominica: natural disasters and economic development in a small island state* [English]. Disaster risk management working paper series; no. 2. Washington, D.C.: The World Bank. <http://documents.worldbank.org/curated/en/875391468770118094/Dominica-natural-disasters-and-economic-development-in-a-small-island-state>

213 In November 2014, the government signed an agreement with Range Developments, a development company, for the construction of a luxury hotel resort as an approved project under its Citizenship By Investment programme. Range Developments subsequently signed an agreement with Kempinski Hotels for the operation of the Cabrits Resort Kempinski Dominica, a 101 room hotel. "Kempinski To Launch Hotel In The Commonwealth Of Dominica", 13 November 2014, Hospitality.Net Available at: <https://www.hospitalitynet.org/news/4067801.html>.

214 "2018-2019 cruise season opens on Tuesday", 28 October 2018, Dominica news online. Available at: <http://dominicanewsonline.com/news/homepage/news/2018-2019-cruise-season-opens-on-monday/>.



Box 26: Fiscal incentives available for tourism investment

Under the Hotels Aid Act (1991) and the Fiscal Incentives Act, the Minister responsible for tourism may grant licences to investors constructing hotels (of not less than five bedrooms) to import duty-free building materials and articles of hotel equipment. Customs duties already paid may also be drawn back. Imports for capital investment, up until the commencement of the hotel's operations may also be exempt from the VAT. Income tax exemptions are available to property developers for the construction and extension of hotels, for a maximum of 20 years. At present there is a consultation in progress geared at reviewing the Hotel Aids Act.

Source: WTO²¹⁵

532. Cruise tourism appears a resilient source of foreign exchange for Dominica. In contrast, rehabilitating accommodation and overnight stay tourism will require more sustained effort before tourist arrivals return to pre-hurricane levels. Integrating "build back better" principles will be important, not least since there were many examples of properties on the island that have survived the storm with their non-concrete roofs intact – evidence that better construction techniques can go far in mitigating disaster risks. A further consideration is to ensure that operators have insurance. One participant at the national consultation suggested that insurance premiums had become unaffordable post-hurricane.
533. Another constraint to the development of overnight stay tourism is airport capacity. Dominica is currently served by 2 airports – Douglas-Charles Airport and Canefield Airport – which are capable of receiving only regional flights from Antigua, Barbados, St Maarten, Saint Lucia, Puerto Rico, Guadeloupe and Martinique. Development of a new international airport would significantly improve air access to the island and allow it to receive direct international flights from beyond the Caribbean region. In April 2017, the government plans to build the new airport at a cost of approximately US\$220 million. However, post-hurricane recovery needs across the economy have slowed progress on this project.²¹⁶
534. With climate change threatening to heighten the impacts of hydro-meteorological hazards, future decades may result in an increased burden of weather-related disasters that can threaten the sustainability of Dominica's development processes. (CIF 2015).²¹⁷ In a more immediate time-frame, the combined impact of the Tropical Storm Erika and Hurricane Maria has reversed progress in debt reduction and caused a collapse in economic output. With significant risks to Dominica's debt sustainability outlook, the IMF assesses Dominica as at "high risk of debt distress."²¹⁸
535. Breaking the cycle of periodic disasters and debt distress is a development priority. The government has announced plans to make Dominica the first "climate resilient nation" in the world. This includes through strengthening the resilience of Dominica's physical infrastructure and natural environment, but also through building greater fiscal resilience, flexibility and ability to cope with climate events and shocks.
536. One element of the resilience strategy is the establishment of the Climate Resilience Execution Agency of Dominica (CREAD). The mission of the agency is to coordinate all reconstruction work to avoid duplication, maximize economies of scale, spot and fill critical gaps, avoid bureaucratic infighting and ensure all reconstruction activities are focused on a single Climate Resilient Recovery Plan developed by Dominica and its partners.²¹⁹ The agency has a four-year mandate, and as the need for recovery action normalises to 'development' it will establish and implement a strategy to transfer its capacities, skills, knowledge and information.²²⁰ Box 27 outlines the proposed approach to reconstruction procurement. An accompanying National Resilient Development Strategy for the period 2018-2030 is currently under development.²²¹

Trade Issues in Disaster Resilience

534. With climate change threatening to heighten the impacts of hydro-meteorological hazards, future decades may result in an increased burden of

215 Trade Policy Review Report by OECS- WTO Members, 18 September 2014, WT/TPR/G/299/Rev.1, World Trade Organization.

216 "PM Skerrit blames Maria for further progress on international airport", 8 May 2018, Dominica News Online. Available at: <http://dominicanewsonline.com/news/homepage/news/economy-development/pm-skerrit-blames-maria-for-lack-of-progress-on-international-airport/>.

217 "Climate Resilience in Dominica", Final Report on the Progress of Dominica's Strategic Program for Climate Resilience and Annual Monitoring" June 2015 https://www.climateinvestmentfunds.org/sites/cif_enc/files/meeting-documents/dominica-2015_ppcr_results_report.pdf.

218 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.

219 "Gov't launches CREAD on Friday afternoon", Dominica News Online, 9 March 2018 Available at: <http://dominicanewsonline.com/news/homepage/news/economy-development/govt-launches-cread-on-friday-afternoon/>.

220 Rebuilding Dominica as a Climate Resilient Nation: the Climate Resilient Execution Agency for Dominica (CREAD), Proposal from the Government of the Commonwealth of Dominica." November 2017, Government of Dominica. Available at: <https://resilientcaribbean.caricom.org/documents/rebuilding-dominica-as-a-climate-resilient-nation-the-climate-resilient-execution-agency-for-dominica-cread-proposal-from-the-government-of-the-commonwealth-of-dominica/>.

221 "National Resilient Development Strategy being developed", 26 June 2018, Dominica Vibes News Available at: <https://www.dominicavibes.dm/news-245234/>.



Box 27: CREAD Procurement: accelerated and to ensure the local private sector can participate

Managing procurement so that it is swift and where possible the local private sector can participate in reconstruction, will comprise a large element of CREAD's work and purpose. Many of the reconstruction contracts needed will be too large for the Dominican private sector to compete realistically. However, we see it as crucial to the recovery that the local private sector is fully engaged. CREAD will ensure tenders are structured so that the work can be carried out by international construction managers with local subcontractors. CREAD will need to have the capacity to procure using both the government's and donors' procedures. It will seek to fast-track and streamline procedures where necessary, to solve problems or find "work-arounds" quickly and will have the power and expertise to negotiate new procedures with donors if existing ones are proving counter-productive.

Source: Government of Dominica²²²

537. The 2014 WTO Trade Policy Review of the OECS noted that Antigua and Barbuda, Dominica, and St Kitts and Nevis passed new legislation on government procurement; the legislation has not yet entered into force in Antigua and Barbuda. OECS-WTO Members generally provide for both public and selective tendering. Public tendering is generally used for larger projects and when required by a donor's rules. Local or regional suppliers are not granted any preferences, except in Dominica.²²³ None of the OECS-WTO Members are parties to the WTO Agreement on Government Procurement.
538. On the fiscal resilience side, this includes: fiscal measures to better integrate sustainable development and climate adaptation strategies into development and budget planning processes; incorporating measures and instruments to better manage and cope with contingent and implicit liabilities arising from natural disaster events; fiscal and tax reforms that increase domestic revenues, but also achieve green growth objectives; and reforms to increase the efficiency and effectiveness of social protection programs. The authorities have requested World Bank support on potential tax reforms to increase domestic revenue mobilization to increase budget and fiscal resiliency. In response to this request, Climate Action Peer Exchange (CAPE) is funding the preparation of a report on how to reform existing fiscal policies on fuel, vehicles and durables and the existing environmental surcharge system; electricity and waste pricing, and fiscal policy for encouraging reforestation.²²⁴
539. Dominica's legal framework for disaster risk management is captured in the Emergency Powers (Disaster) Act: Chapter 15:03 – Act 20 of 1987. This act gives the Head of State the authority to declare a state of emergency and take necessary action to respond to disasters. Since 2014, Dominica has been in the process of finalising a draft Comprehensive Disaster Management Bill with the assistance of the Caribbean Disaster Emergency Management Agency. (Katafono, 2018).²²⁵
540. Dominica developed a National Disaster Plan in 1986, which was subsequently revised in 2001 and again in 2009. The plan details arrangements to manage the effects of disasters, assigns responsibilities and outlines coordination of emergency activities during major disasters, and encourages a process of learning to cope adequately with the recovery. Dominica's National Emergency Planning Organisation (NEPO) has the central responsibility for the planning and organisation of counter-disaster measures. NEPO oversees the Office of Disaster Management (ODM), its implementation arm, district- and community-level committees, and various taskforces. (Katafono, 2018).²²⁶
541. For both, budget allocation to these offices, although marginal against total government expenditure (under 0.2%), has increased significantly, demonstrating the increased priority of disaster risk within central government. ODM's allocation doubled from US\$84,407 in 2011/12 to US\$197,899 in 2014/15 and then to US\$203,355 in 2015/16. Dominica's NEPO and ODM work closely with the CDEMA in responding to disasters. The CDEMA is a regional intergovernmental agency for disaster management in the Caribbean Community, with responsibility for the mobilisation and coordination of emergency response and relief efforts to its participating states. (Katafono, 2018).²²⁷

222 "Rebuilding Dominica as a Climate Resilient Nation: the Climate Resilient Execution Agency for Dominica (CREAD), Proposal from the Government of the Commonwealth of Dominica." November 2017, Government of Dominica. Available at: <https://resilientcaribbean.caricom.org/documents/rebuilding-dominica-as-a-climate-resilient-nation-the-climate-resilient-execution-agency-for-dominica-cread-proposal-from-the-government-of-the-commonwealth-of-dominica/>.

223 "Trade Policy Review, Report by the Secretariat: OECS-WTO Members", 22 September 2014, WT/TPR/S/299/Rev.1.

224 "Dominica: Tax Reform to Boost Climate Resilience", 19 October 2018, David Cal MacWilliam, Climate Action Peer Exchange, <https://www.cape4financeministry.org/blog/dominica-tax-reform-boost-climate-resilience>.

225 "Comparative Analysis of Disaster Risk Reduction and Management in Dominica and Vanuatu: Lessons for Small States", Small States Digest, No. 2018/01, Commonwealth Secretariat, London, <https://doi.org/10.14217/6f77cc82-en>.

226 Ibid.

227 Ibid.



Box 28: Options for investing in disaster risk reduction

Risk cannot always be averted, however, and in those cases, countries should invest in ways to lessen the impact of disasters, including the following:

- **Self-insurance by building fiscal cushions.** Several Caribbean states are establishing frameworks to self-insure systematically.
- **Insurance and hedging tools allow** the public and private sectors to pool risk for moderate disasters, for which the cost of large buffers through self-insurance may become too high. These tools call for deeper and more developed financial markets that facilitate risk pooling, expand the insurance market, and provide access to financing for infrastructure projects that build resilience.
- **Innovative risk-sharing tools** provide governments with additional relief in managing disaster risks. Parametric insurance bases pay-outs on the nature of a disaster and bypasses on-site loss assessment, offering quick relief. An example is the World Bank's Caribbean Catastrophe Risk Insurance Facility—a regional fund that allows governments to limit the financial impact of natural disasters by providing quick liquidity when a major disaster strikes. Catastrophe bonds (cat bonds) are another risk-sharing tool that transfers the risk to markets in exchange for generous regular payments (coupons) and allows the issuer to forgo repayment of the principal if there is a major disaster.
- **Contingent lines of credit** with bilateral, multilateral, and commercial creditors put financing in place before disaster hits, reducing funding uncertainty. The World Bank Catastrophe Draw-Down Option—a credit line that can be accessed after declaration of a state of emergency because of a natural disaster—offers middle-income countries immediate access to funds when liquidity is most scarce.

Source: IMF²²⁸

542. Experience suggests that, despite the clear benefits of preparation, countries perennially underinvest in risk reduction and prevention. When risk cannot be averted or mitigated at reasonable cost, relying on borrowing, external aid, or disaster-financing facilities from international financial institutions may be the only recourse. IMF research suggests several factors may be at play:

- Obtaining funds to prepare for a disaster is limited, given complex eligibility and disbursement criteria, information gaps, and the absence of coherent plans for access that may be hard to design in a low-capacity environment.
- Insurance coverage remains low, given the high cost, shallow financial markets, limited competition, or when a particular disaster is not covered in the insurance contract.
- Even though many Caribbean states subscribe to the Caribbean Catastrophe Risk Insurance Facility, pay-outs have been small compared with the costs, because countries simply cannot afford to pay for higher insurance coverage. Pooling risk to include other small states across the globe could reduce premiums, reflecting a lower risk that all countries will be hit by the same shock.

- The cat bond market for very large disasters is small and shallow, making cat bonds too expensive for a single country.²²⁹

543. Stakeholders from the private sector recognized the importance of preparing for disasters during then national consultation. For them, resilience equated to a combination of advance preparation and quick recovery. They argued that building resilience in the trade sector was critical in view of Dominica's import dependence. Emphasis was placed on improving port operational efficiency and trade facilitation as key investments in promoting resilience. The issue was raised by the survey team in discussion with the Caribbean Customs Law Enforcement Council.

544. A general point made by the private sector was that their issues had received insufficient attention from government, humanitarian organizations and development partners. Enhancing Dominica's growth prospects requires higher private sector participation and improving the business environment. To this end, the IMF has stressed the need to improve the business environment, including efforts to reduce the costs of dealing with the government. (IMF 2018).²³⁰

545. Stakeholders from the private sector also recognized the importance of Business Continuity Planning. It was suggested that some critical stakeholders dealing with foods and other essentials, such as

228 "Bracing for the storm: For the Caribbean, building resilience is a matter of survival", Inci Ötoker and Krishna Srinivasan, Finance & Development, March 2018, Vol. 55, No. 1, International Monetary Fund.

229 Ibid.

230 Dominica : 2018 Article IV Consultation-Press Release and Staff Report, IMF Country Report No. 18/265 <https://www.imf.org/en/Publications/CR/Issues/2018/09/05/Dominica-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-46204>.



supermarkets and grocery stores, would have gained much from integrating business continuity planning into their operations prior to the passage of Hurricane Maria. This was also noted in relation to the operation of the ICT sector, which many private sector participants recognized as a critical lifeline. Telecoms firms present indicated that they had several redundancies built into their systems and satellite phones as a backup communication tool. St. Lucia had been used as a hub for emergency operation.

546. The Caribbean Tourism Organization highlighted also highlighted the need for Business Continuity Planning (BCP) in the tourism sector during a meeting with the survey team. Smaller family-owned hotels tend not to have a BCP or insurance, and therefore tend to be impacted more by a disaster. In contrast, because larger operations tended to have policies on BCP, often determined at a group level across multiple jurisdictions.

547. During the national consultation meetings, the Director of Trade, Mr Matthan Walter, offered some thoughts on how Dominica might strengthen its trade regime in advance of future disasters. Suggestions he made in this regard included *inter alia*:

- Liberalization of Dominica's GATS Services schedule through additional commitments, including in the medical, insurance and ICT sectors.
- Streamlining of customs procedures as part of implementation of the WTO Trade Facilitation Agreement; and
- Applying international standards to develop resilient infrastructure with support from development partners.

548. One way in which the government is seeking to break the vicious circle of disasters and debt is through investment in resilient infrastructure, despite its higher upfront cost. Given the high frequency of natural disasters, the additional cost is justified, but again fiscal constraints are a limiting factor.

549. IMF analysis, based on a model calibrated to Dominica, indicates that resilient infrastructure can have positive effects on output, private wages, and employment. Assuming a natural disaster with damage in line with historical averages occurs every five years, the increase in public investment expenditures due to the higher cost of resilient structures would be recovered in the form of higher tax revenues from improved economic performance. The decline in the expected loss from

natural disasters increases private investment wages, and output, while reducing out-migration of labour. The IMF simulations indicate that output gains from resilient investment more-than-offset its additional cost by a factor of 3, including the reduced output loss with resilient capital and the improved long-term effect on output. (IMF 2018).²³¹

550. An investment in resilient infrastructure that promises a high development and trade return is the development of geo-thermal energy. Reliance on imported diesel to produce electricity means Dominica faces electricity prices that are among the highest in the world. (World Bank 2017).²³²

551. Operated by the Dominica Electricity Services Limited, a vertically integrated private utility, Dominica's power system is small, with a total installed capacity of 26.7 MW and 36,000 customers, of which 31,000 are residential. Except for 6.64 MW of hydropower, most of the installed generation capacity is fuelled by imported diesel. Dominica's retail electricity price, averaging around US\$0.40 per kilowatt hour (kWh), is among the highest in the world. (World Bank 2017).²³³

552. High and volatile electricity costs also severely hit domestic consumers, and especially the poor. The rising burden on households' spending affects living standards and constraints efforts towards poverty reduction. In addition, increased costs of diesel imports create a severe negative impact on the country's balance of trade. (World Bank 2017).²³⁴

553. Developing geothermal resources can critically help stabilize long-term electricity costs and be a 'game changer' for Dominica. Lowering and stabilizing electricity costs is the single most impending priority for Dominica's power sector and can be met by developing the country's significant geothermal potential. As an indigenous resource, it also offers a natural hedge against the price volatility of imported fuels. (World Bank 2017).²³⁵

231 Idem.

232 "Dominica Geothermal Risk Mitigation Project (P162149)", Project Document, 3 May 2017, World Bank Available at: <http://pubdocs.worldbank.org/en/352841531831371451/5224-XCTFDM619A-Dominica-Project-Document.pdf>.

233 Ibid.

234 Ibid.

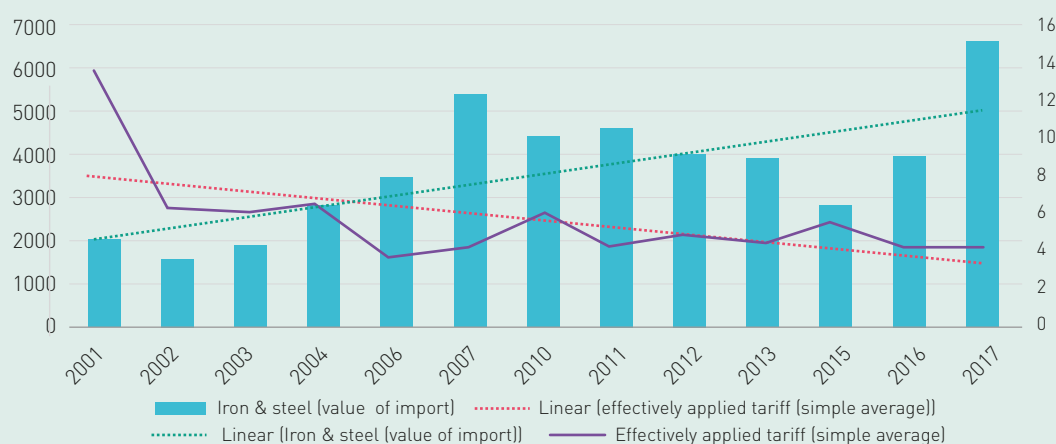
235 Ibid.



Box 29: Tariffs and imports of cement and steel

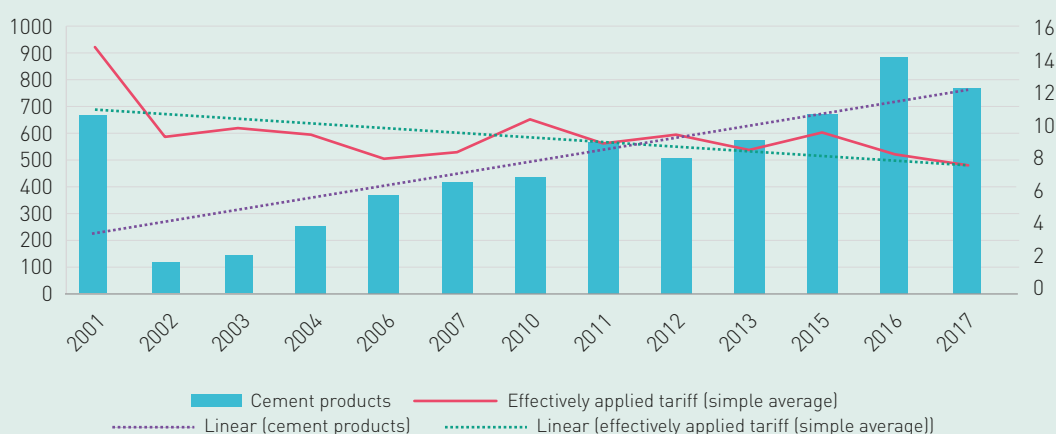
Tariffs imposed on imported building materials directly influence demand, domestic prices and so the volume of imports. In turn this influences the speed of recovery and resilience to future natural disasters. Figure 26 and Figure 27 show the relationship between the effectively applied tariff rates and values of imports of iron and steel as well as articles of stone, plaster, cement, asbestos and mica. Figure 17 highlights how tariffs are inversely related to the value of imported iron and steel in Dominica. At higher tariff values, the import of iron and steel declines. This phenomenon is pronounced from 2010 to 2016 where tariff rates were on decreasing trajectory. The minimum tariff rates for iron and steel in 2001 and 2010 were 10% and 5% while the value in all other years was zero at a Bound Tariff (BND) rate of 50%.

Figure 26: Tariff and value of import of iron and steel in Dominica



Source: Computation based on data from ITC and WITS

Figure 27: Tariff and value of import of stone, plaster, cement, asbestos & mica



Source: Computation based on data from ITC and WITS

Figure 27 also shows the same inverse relationship between tariff rate and imports of articles of stone, plaster, cement, asbestos and mica. The inverse relationship is more visible between 2010 and 2017 where a sharp decline in the rate in 2015 was associated with a large increase in the value of imports. The drop-in imports in 2017 can be attributed to port disruption due to Hurricane Maria.



554. Research indicates that switching baseload generation from diesel to geothermal could reduce wholesale electricity costs in Dominica by 15 to 25 percent, and help stabilize price fluctuations in the domestic market. Moreover, according to preliminary estimates, the country's overall geothermal potential far exceeds the near-term baseload needs of its small domestic market. (World Bank 2017).²³⁶
555. Geothermal energy provides Dominica with an opportunity to become a regional energy hub, transmitting excess supply produced from geothermal sources to neighbouring islands and earning considerable royalties from electricity exports. Guadeloupe and Martinique – both French territories – have shown interest in importing electricity. (World Bank 2017).²³⁷ Dominica has made major progress towards developing the Wotten Waven-Laudat geothermal field in the Roseau Valley. Financing is being provided by the Agence Française de Développement, the European Union, Guadeloupe, Martinique, New Zealand and the World Bank. (World Bank 2017).²³⁸
556. A consideration when implementing reconstruction activities according to "build back better" is tariff policy. Box 29 highlights how demand for key inputs needed for hardening infrastructure (i.e. steel and cement) are influenced by import tariff policy.
559. St. Lucia was hit by multiple external shocks in the mid-2000s, including Hurricane Dean in August 2007, an earthquake in November 2007, the global food and energy price hikes in 2007–2008, and severe droughts in 2009 and 2010. The topography of St. Lucia makes the country vulnerable to disasters. A combination of high slope angles and rainfall causes a high risk of landslides. In addition, underdeveloped infrastructure poses a challenge for the county to reduce vulnerability to disasters (World Bank, 2014).²⁴¹
560. Annual average loss from wind-related events and floods amount to approximately US\$49 million, or 3.4 percent of GDP. On average, once every 100 years, these costs outstrip US\$882 million, equivalent to more than 61 percent of GDP. This means that even without climate change, there is a 1 percent probability in any year that a disaster would incur national costs of more than 61 percent of GDP (IMF, 2018).²⁴² Besides, small-scale flooding is more frequent in low-lying areas (World Bank, 2014).
561. IMF research suggests that frequent and severe natural disasters would substantially harm long-term growth and fiscal sustainability. In a high CO₂ emissions scenario, the average impact of natural disasters would increase from 3½ percent of GDP or more to at least 5 percent of GDP. Tax revenues would be negatively affected, and additional expenditure would be needed for immediate relief, social support, infrastructure rehabilitation, and reconstruction.²⁴³

ST LUCIA

Overview of Vulnerability and Storms

557. Saint Lucia is an upper-middle-income small island state with a population of 174,000 and gross national income per capita of US\$10,300. While Saint Lucia continues to increase resilience through investment in infrastructure and economic diversification, the country remains highly exposed to natural disaster risks. Historically, weather-related hazards such as winds and floods landslides, often caused by hurricanes, and droughts have adversely impacted the country, resulting in putting burdens on the national budget and its economy (World Bank, 2014).²³⁹
558. St. Lucia is listed fifth at risk for natural disasters among small states (IMF, 2018).²⁴⁰ During 1997–2016, St. Lucia positions among the top 10 percent regarding losses from climate-related disasters and the top 15 percent of fatalities out of the 182

236 Idem.

237 Idem.

238 Idem.

239 "Saint Lucia, Flood Event of December 24–25, 2013: A Report by the Government of Saint Lucia and the World Bank"

March 2014, Available at: <https://www.gfdrr.org/sites/default/files/publication/pda-2014-saint-lucia.pdf>.

240 "St. Lucia – Climate Change Policy Assessment" (IMF Country report No. 18/181), IMF. [2018] Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/06/21/St-46007>.

241 "Saint Lucia, Flood Event of December 24–25, 2013: A Report by the Government of Saint Lucia and the World Bank"

March 2014, Available at: <https://www.gfdrr.org/sites/default/files/publication/pda-2014-saint-lucia.pdf>.

242 IMF. [2018]. World Economic Outlook retrieved from <https://www.imf.org/external/datamapper/datasets/WEO/5>.

243 "2018 Article IV Consultation – Press Release, Staff Report, and Statement by the Executive Director for St. Lucia", Jun 2018, IMF Country Report No. 18/179 Available at: <https://www.imf.org/~media/Files/Publications/CR/2018/cr18179.ashx> The text references a further IMF report "St. Lucia Climate Policy Assessment", IMF Country Report No. 18/181 Available at: <https://www.imf.org/~media/Files/Publications/CR/2018/cr18181.ashx>.



Meetings with National Authorities

562. The survey team's meetings began with a courtesy call on Ben Emmanuel, Cabinet Secretary in the Prime Minister's Office. Mr Emmanuel highlighted the commitment of the government to integrate resilience into government policy. Resilience was a central theme of the 2018-2019 budget cycle and was being promoted across government processes and procedures. Government agencies were being supported to see resilience as a critical part of their operations.

563. Discussing the impact of natural disasters, he contrasted the position of Saint Lucia with that of US residents in relation to Hurricane Katrina. While evacuation out of harm's way was an option in the US, this was not an option available for most Caribbean residents. A further point he stressed was that Saint Lucia suffered even when it was not directly hit by a storm event, through trade diversion and higher costs. An example here was the OECS currency union and single market through which the impacts of a disaster in one member were transmitted to other OECS members.

564. In small, open economies, Mr Emmanuel noted that trade plays a critical role in disaster mitigation. There was a need to recognize this role within trade rules. This point was further underscored in discussions with Permanent Secretary Titus Preville. He noted that within the WTO, the concept of an island was lost. For WTO Members within the UN category of Small Island Development States, the question was how to find an accommodation within the existing rules that recognized the reality of their vulnerability. He recommended that vulnerability should be factored into:

- Access to concessional development assistance (from which St Lucia was excluded by virtue of its income level). A suggestion he made in this respect was a vulnerability-adjusted GDP index that would allow small island states access on similar conditions to least-developed countries;
- Consideration of promoting resilience within the Aid for Trade initiative and recommendations on how resources should be directed to achieve this goal and infrastructure. Building resilience into infrastructure imposed higher costs (e.g. flood resistant roads) that added to an already heavy debt burden;
- Policy space, notably a peace clause providing freedom from WTO dispute settlement challenge during the recovery period after a storm. There was an existing body of work on small states and their vulnerabilities that highlighted these issues. He suggested that it was a source of disappointment that it took a destructive event such as Hurricane Maria for the WTO to take notice of these concerns. The Caribbean has already had to digest significant

adjustment costs due to the loss of banana preferences for its export industry. It was important that the WTO recognized the ongoing adjustment imposed by natural hazards such as severe weather event. Flexibilities should be considered that would seek to promote resilience. The Caribbean was already experiencing situations where potential investors looking to establish businesses were rethinking their projects. Global warming made the region potentially less attractive from an investment perspective.

565. Permanent Secretary Titus Preville recalled that Prime Minister Chastanet had made the case for a change of perspective on the part of international financial institutions so as to consider resilience as a rational for extending further concessional financing to the region. The high public debt position of the region and associated financing difficulties was another factor to consideration in this context. For small economies, resilience was not a choice. It was a question of when, not if, the next natural hazard would strike.

Meetings with Public and Private Sector Stakeholders

566. On 29-30 August 2018, the WTO research team held a series of consultations with public and private sector stakeholders. The following section discusses the main issues arising from the consultations, organized according to trade issues arising in disaster response, disaster recovery and disaster resilience. Issues identified in the consultations are supplemented with information from other sources on the same topics.

Trade Issues in Response

567. While St. Lucia was spared direct damage during the 2017 hurricane season, it felt the impact of successive storms on neighbouring islands, and further afield. An example given by a private sector stakeholder was in relation to express courier services used to export goods to the United States. Damage inflicted by Hurricane Irma on the UPS regional hub for the Caribbean in Puerto Rico forced one private sector stakeholder indicated, and other exporters, to re-route exports to other express carriers and use alternative routings, in his case through Central America. The logistics disruption had resulted in a loss of orders and higher costs as new standards and certification requirements had to be met. The UPS hub had been closed for one month and had taken time to return to normal operations.

568. Weather-related disruption of maritime shipping was another factor cited by private sector stakeholders as affecting their operations, even though neither Hurricane Irma nor Maria affected St. Lucia directly. Damage and delays to ports in Florida had knock-on impacts in terms of importing



and exporting consignments. One stakeholder cited US maritime transport and cabotage restrictions as a further complicating factor.²⁴⁴ The impact of hurricanes on major ports is reportedly leading large shipping companies to re-examine their hub strategies for cargo trans-shipment operations.

The impact of Hurricane Matthew on port operations in the Bahamas, a trans-shipment hub for Caribbean traffic, was cited as an example in this regard.²⁴⁵ Box 30 below discusses disruption at Florida ports and related difficulties for Caribbean islands for cargo and cruise traffic.

Box 30: Impacts to Florida Ports from Hurricane Maria

- The Port of Miami, Port Everglades, Port of Palm Beach, and Port Canaveral will experience significant physical damage due to storm surge. Port facilities will also be impacted by wind damage, loss of power and communications, and roadway blockages.
- Cargo receipts and shipments along the east coast of Florida will be significantly disrupted for weeks, including the movement of containers at all ports, the receipt of gasoline at Port Everglades, and exports from the Port of Palm Beach.
- The Port of Palm Beach is a major exporter to the Bahamas and other Caribbean islands. Disruptions at this port could have a significant short-term economic impact for Caribbean islands and slow their recovery from Hurricane Irma.
- Ports along the east coast of Florida are the busiest cruise ports in the United States and will experience significant physical damage from storm surge, rain, and sustained winds that can disrupt cruise line operations for weeks or months.
- It will take weeks or months to return to full operations at terminals, depending upon the extent of the damage.

Source: US Department of Homeland Security 2017²⁴⁶

569. During Hurricane Maria, St Lucia had acted as a logistics hub for international and regional relief assistance for Dominica for response and recovery. St- Lucia's National Emergency Management Organization (NEMO) had experienced various challenges in sending relief goods to Dominica. One issue cited was container management. NEMO highlighted that had still not received back containers used to ship relief goods. This problem underscored the need for efficient transport and logistics systems across OECS and CARICOM countries.

570. Local stakeholders agreed that past disasters had significantly impacted trade. For example, St Lucia's Customs and Exercise Department had observed a sudden surge of import consignments in the aftermath of Hurricane Tomas in 2010. One challenge discussed in this regard was differentiating commercial goods and relief goods. A point made by several agencies was that goods imported duty-free as relief items should not compete with local products, where available. The challenge of deciding which goods to supply as relief items for households was discussed and the point made that consumer demand was typically more diverse than government predicted.

571. One issue raised was whether a waiver system was necessary at all, or if relief could be better and more efficiently processed through regular commercial trade, if the necessary investment was made in trade facilitation systems. Revenue forgone was a factor highlighted by some public sector participants. Some suggested that a system of *ex post* relief from duties would be hard to manage, and could cause confusion from a revenue perspective. Some were concerned about the impact of import duties on government finances. Others instead highlighted that fiscal incentives were vital to response and recovery phases in several sectors, including tourism and construction sectors.

572. Several stakeholders, including the Chamber of Commerce, indicated that the speed in granting waivers after a disaster was critical. One suggestion made in this context was that a list of goods for duty waiver could be agreed before a disaster hits. The Chamber of Commerce raised examples of items to be duty exempted: hurricane straps and shutters, radios, generators, satellite phones, waterproof bags, and others. The Chamber of Commerce participates in national emergency management coordination committees. Non-automatic import licensing for chainsaws was highlighted by one participant as a potential constraint to waste

244 In advance of the arrival of Hurricane Maria, a waiver from the Jones Act was approved to land petroleum products to be delivered for relief assistance. A further waiver to the Jones Act was approved for all products being shipped to Puerto Rico in late September. "Department of Homeland Security Acting Secretary Elaine Duke Approves Waiver of Jones Act", 28 September 2017, US Department of Homeland Security. Available at: <https://www.dhs.gov/news/2017/09/28/departement-homeland-security-acting-secretary-elaine-duke-approves-waiver-jones-act>.

245 "Hurricanes make operators review transshipment strategy", 17 October 2017 The Bulletin Panama. Available at: <http://thebulletinpanama.com/2017/10/hurricanes-make-operators-review-transshipment-strategy/>.

246 "Impacts to Florida Ports from Hurricane Irma", 7 September 2017, Office of Cyber and Infrastructure Analysis, US Department of Homeland Security. Available at: <http://fttrucking.org/wp-content/uploads/2017/09/Hurricane-Irma-Impacts-to-Florida-Ports-FOUO.pdf>.



management in the aftermath of hurricanes. Import licences were issued by the Ministry of Agriculture. Introduced as a forest protection measure, concern was raised that it would slow clearance of waste.

573. National consultation participants also discussed the process for drawing up lists of exempted goods. List of items to be exempted were devised by the National Emergency Management Office (NEMO). A Cabinet decision would then follow indicating which emergency items would be exempted from duties. This list would then be submitted to Customs and Exercise. The Customs and Exercise Department would then work with NEMO and other humanitarian agencies, such as the International Federation of the Red Cross and Red Crescent, to implement the waiver decision. In meetings with the Caribbean Disaster Emergency Management Agency (CDEMA), reference was made to guidance on potential goods to be exempted for import tariff and other taxes on relief goods. (Box 31 provides information on CDEMA and its activities.)

574. The six OECS-WTO Members are founding members of the Caribbean Community and Common Market, established in 1973 through the Treaty of Chaguaramas. Since 1991, CARICOM member States have sought to implement a common external tariff (CET), through a phased process. Exceptions are allowed permitting the non-application of the CET under certain circumstances. One of these situations is disaster response. Any change in tariffs by a CARICOM member must first be approved by the Council for Trade and Economic Development. This Council is composed of trade and development ministers from all member States and is responsible for promoting trade and economic development in CARICOM.²⁴⁷

575. The Treaty of Chaguaramas was revised in 1989 to allow for the creation of the CARICOM Single Market and Economy (CSME), a single economic space with free movement of goods, services, capital, and CARICOM nationals between member States; the revision was completed in 2000. The Treaty contains safeguard provisions. In the event of serious balance of payments and external financial difficulties, it allows for the adoption of restrictions on the right to establishment, to provide services and to move capital, as well as using quantitative restrictions on imports.²⁴⁸

576. Separate meetings held with the Caribbean Customs Law Enforcement Council (CCLEC) highlighted that preparedness of customs authorities was vital for disaster risk management. The Council had partnered with Caribbean Disaster Emergency Management Agency on training workshops for

customs officials on disaster management. One proposal discussed with CCLEC was secondment of customs officers from other CCLEC members to help customs officers deal with post-crisis import surge. A point made by some private sector stakeholders was that customs had not extended its operating times during previous disasters, mainly due to personnel constraints.

577. Saint Lucia ratified the Trade Facilitation Agreement (TFA) on 8 December 2015. In a notification received on 16 September 2016²⁴⁹, Saint Lucia notified almost 50% of the commitments under category A, the commitments it implements in full on the entry into force of the TFA (22 February 2017). Measures related to trade facilitation measures for authorized operators were notified under category B, with an indicative date for implementation of 31st December 2020 and definitive date of implementation of 29 December 2023. Other measures notified in category B with definitive implementation dates, range between 2023 and 2033. Technical assistance for implementation was sought for all measure notified under category C, including notification for enhanced control or inspections, single window etc.²⁵⁰

Trade Issues in Recovery

578. Past natural disasters have differentially impacted different economic sectors in St Lucia. Worst hit has been the agriculture sector. The sector was slow to recover after Hurricane Tomas (2010), particularly banana plantations which were severely affected by silt deposits, debris, flooding and snapping of plants. Hurricane Tomas affected 98 per cent of the nation's banana cultivation. Damage to bananas accounted for approximately 75% of the total damage to the agriculture sector.²⁵¹ Hurricane Tomas caused significant damage to road infrastructure, a further factor limiting plantation recovery in rural areas.

247 "Trade Policy Review, Report by the Secretariat: OECS-WTO Members", 22 September 2014, WT/TPR/S/299/Rev.1.

248 Ibid.

249 <https://www.tfadatabase.org/uploads/notification/NLCA1.pdf>.

250 https://www.tfadatabase.org/uploads/notification/NLCA1_3.pdf.

251 Emergency Project Paper on a Proposed Credit to Saint Lucia for a Hurricane Tomas Emergency Recovery Project, 17 February 2011, World Bank Report No: 59604-LC, Available at: <http://documents.worldbank.org/curated/en/371301468112476687/pdf/596040P1252050IDA1R20111004511.pdf>.



Box 31: From response to management: the evolving role of the Caribbean Disaster Emergency Management Agency

The Agency was established in 1991 as the Caribbean Disaster Emergency Response Agency (CDERA) with primary responsibility for the coordination of emergency response and relief efforts for its 18 participating Caricom and non-Caricom members states.²⁵²

Four of CDEMA's areas of responsibility relate to disaster response i.e.

- 1) mobilising and coordinating disaster relief;
- 2) Participating States;
- 3) providing an immediate and coordinated response by means of emergency disaster relief to any affected Participating State;
- 4) securing, coordinating and providing to interested inter-governmental and non-governmental organisations reliable and comprehensive information on disasters affecting any Participating State(s).

A key mechanism for CDEMA in discharging its disaster response functions is the Regional Response Mechanism. The RRM is a network of CDEMA Participating States (PSSs), national, regional and international disaster stakeholders through which external response and relief operations are coordinated. The RRM is regulated by the national disaster plans of participating states synced to a regional coordination plan, and agreements with partners. A review of the RRM in the aftermath of Hurricanes Irma and Maria concluded that persistent challenges in the logistics platform for timely delivery of personnel and supplies have prevented the mechanism realizing its full potential. Other constraints identified include: divergent standards, limited and unpredictable funding and coordination issues as other actors operate outside the framework.

In 2001, recognising the critical link between disasters and sustainable development, CDERA moved to the adoption of a strategic framework for Comprehensive Disaster Management (CDM) i.e. the integration of disaster management considerations into development planning and decision-making processes. The Caribbean Disaster Emergency Management Authority succeeded CDERA with a new legal mandate that entered into force in 2009. Two CDEMA functional areas relate to Disaster Management and are guided by a Regional Comprehensive Disaster Management Strategy for the period 2014-2024. These are:

- 1) encouraging: (i) the adoption of disaster loss reduction and mitigation policies and practices at the national and regional level; and (ii) cooperative arrangements and mechanisms to facilitate the development of a culture of disaster loss reduction; and
- 2) coordinating the establishment, enhancement, and maintenance of adequate emergency disaster response capabilities among the Participating States.

To help advance the regional CDM strategy, CDEMA has articulated an "Enhanced Resilience Pathway" that focuses on promoting: Social Protection for the Marginal and Most Vulnerable; Enhanced Economic Opportunities; Improved Environmental Protection; Safeguarded Infrastructure and Operational Readiness for Response and Recovery. Priority sectors for the mainstreaming CDM include agriculture, tourism and finance and economic development.

Source: Caribbean Disaster Emergency Management Agency²⁵³

579. In addition to the losses caused by Hurricane Tomas, a disease outbreak further damaged the sector. Since 2010, the industry has been threatened by a soil-borne fungus black sigatoka (also known as banana leaf spot disease), which has infected roughly 70 percent of the country's banana plants. The government and development partners have been investing in a multi-year Banana Productivity Improvement Project to control the disease. Box 32 below discusses natural disasters and the spread of pests and diseases.

580. Stakeholders noted that the agriculture sector tends to need more time to recover from natural disasters than other sectors. The example was cited of Grenada and nutmeg. Grenada had been the second biggest nutmeg producer in the world prior to Tropical Storm Earl and Hurricane Emily in 2005. These storms had destroyed more than 60 per cent of the island's nutmeg production. Replanted seedlings took more than 10 years to fully mature.²⁵⁴

252 CDEMA comprises 18 participating states: Anguilla, Antigua and Barbuda, Commonwealth of the Bahamas, Barbados, Belize, Commonwealth of Dominica, Grenada, Republic of Guyana, Haiti, Jamaica, Montserrat, St. Kitts & Nevis, Saint Lucia, St. Vincent & the Grenadines, Suriname, Republic of Trinidad & Tobago, Turks & Caicos Islands and the Virgin Islands.

253 CDEMA website, "Rapid Review of the Regional Response in the Hurricanes Irma and Maria Events", October 2017, Caribbean Disaster Emergency Management Agency Available at: https://www.cdema.org/Rapid_Review_of_the_Regional_Response_-_Irma_and_Maria_Events_2017_Final.pdf.

254 "Grenada: A Nation Rebuilding An assessment of reconstruction and economic recovery one year after Hurricane Ivan", 31 October 2005, World Bank Group. Available at: http://siteresources.worldbank.org/INTLACREGTOPHAZMAN/Resources/grenanda_rebuilding.pdf.



Box 32: Natural disasters and the spread of pests and diseases

Large scale disturbance events such as hurricanes, cyclones and typhoons have long been associated with the establishment and spread of invasive species. Alterations of habitat characteristics by natural and anthropogenic disturbances, or change in disturbance regimes, are quite often associated with invasion success. Disturbances benefit invasive species by reducing competition with resident species and increasing resource availability.²⁵⁵ Not only may invasive species be injurious to agricultural production, they may expose affected countries to sanitary and phytosanitary measures taken by trading partners to restrict the entry, establishment and spread of these alien pests through international trade.

Hurricane Joan (1998) is thought to have carried African locusts across the Atlantic. A swarm of the locust, *Schistocerca gregaria*, blown off the Western African coast near the Cape Verde Islands was subsequently picked up storm winds and transported the 3,000 miles to the Caribbean. Fatigue from the five-day crossing, exposure to salt air, unaccustomed humidity and natural predators in the local bird population prevented the locusts from establishing or spreading on the islands where sightings were made.

Hurricane Irma caused damage totalling some \$760 million in damage to Florida's citrus sector. The hurricane winds may also have encouraged the spread of Asian citrus psyllid. This insect is a vector for citrus greening disease (yellow dragon disease) that causes fruit to be misshapen and overly bitter.²⁵⁶ Research also suggests that hurricanes may also helped spread the cactus moth, *Cactoblastis cactorum*, from the Caribbean into North America. DNA analysis of the cactus moths highlighted that populations in Florida were genetically closer to those of Cuba than to the rest of the population sampled in Florida.²⁵⁷

Flooding is known to have an important role in spreading the fungus associated with *Fusarium oxysporum* f. sp. *Cubense* (FOC TR4). FAO explains that spores can be carried in irrigation water or surface run-off.²⁵⁸ Furthermore, fungus can remain dormant in the soil for more than 30 years until a susceptible banana plant is established nearby.²⁵⁹ In Jamaica, FOC TR4 was associated with flooding, while in Guadeloupe, the disease has been associated with volcanic eruptions.²⁶⁰ Preventing the entry of contaminated planting material, soil and worker equipment etc. to disease free areas is considered the most effective method of controlling the disease.

581. The impact of disasters on the tourism sector was discussed. A meeting with the Caribbean Tourism Organization highlighted public misconception in target tourist markets that the entire Caribbean had been struck by 2017 storms. CTO reported significant trade destruction (i.e. cancellation of holidays) and trade diversion (i.e. booking to other destinations). Trade diversion was also evident within the Caribbean, with cruise arrivals up 300% in St Kitts and Nevis and a cruise ships spending additional days at Castries. The hurricane season resulted in an estimated (loss) in 2017 of 826,100 visitors to the Caribbean, compared to pre-hurricane forecasts. These visitors could have generated USD 741 million and supported 11,005 jobs.²⁶¹

582. According to Caribbean Tourism Organization statistics, St. Lucia total visit arrivals in 2017 hit an all-time high, when the island welcomed 1,105,541 travellers. St. Lucia also recorded the highest growth among CTO member countries, registering an 11 percent increase. Cruise sector recorded a 14 percent increase, reaching 669,217 – an additional 81,264 visitors despite the eight-month closure of the Pointe Seraphine Berth. The tourism sector is the primary source of foreign currency, accounting for 50.7% of exports as a percentage of GDP in 2017 (IMF 2018). Increases in hotel stock, new flights routes and expansion in arrivals from key US and EU markets drove the growth in arrivals. Trade diversion, as tourists were rebooked from other hurricane-affected destinations, may have exerted an influence on increased bookings in the final quarter.

255 "Hurricane Activity and the Large-Scale Pattern of Spread of an Invasive Plant Species". 30 May 2014, Bhattarai GP, Cronin JT [2014]PLoS ONE 9(5): e98478. Available at: <https://doi.org/10.1371/journal.pone.0098478>.

256 "One-two punch of disease and Irma has left Florida citrus reeling" 10 February 2018, Kalhan Rosenblatt, NBC News. Available at: <https://www.nbcnews.com/storyline/hurricane-irma/one-two-punch-disease-irma-has-left-florida-citrus-reeling-n839996>.

257 "A potential invasion route of *Cactoblastis cactorum* within the Caribbean region matches historical hurricane trajectories", May 2015, Guadalupe Andraca-Gómez, Mariano Ordano, Karina Boege and Cesar Dominguez, Biological Invasions, 17(5) · May 2015 Available at: https://www.researchgate.net/publication/274572420_A_potential_invasion_route_of_Cactoblastis_cactorum_within_the_Caribbean_region_matches_historical_hurricane_trajectories.

258 *Fusarium Wilt Tropical Race 4 (FOC TR4)*, Food and Agriculture Organization of the United Nations. Available at: <http://www.fao.org/world-banana-forum/projects/fusarium-tr4/disease/en/>.

259 Ibid.

260 *Fusarium wilt or Panama disease: the disease, historic overview, current situation and potential impact of TR4 in Latin American and the Caribbean*, Miguel Angel Dita Rodriguez, EMBRAPA, Available at: http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/caribbeantr4/03HistoryImpact.pdf.

261 "The Impact of the 2017 Hurricane Season on the Caribbean's Tourism Sector", April 2018, World Travel and Tourism Council Available at: <https://www.wttc.org/-/media/files/reports/2018/caribbean-recovery-report---executive-summary.pdf>.



583. Tourism in St. Lucia is limited by capacity constraints, including an inadequate road network and an outdated international airport. (IMF 2018)²⁶² An expansion and modernization of Hewanorra International Airport, with support from development partners, is in the pipeline. This investment should also shave an important resilience dimension in the context of future meteorological hazards.
584. One concern raised by stakeholders at the national consultation was to ensure that the necessary plans are in place *ex ante* to deal repatriation of foreign nationals in the event of a disaster. In separate meetings with the Caribbean Tourism Organization (CTO), they explained how they had coordinated with CDEMA on the issue of tourist repatriation during the emergencies created by Hurricanes Irma and Maria. In CTO's opinion, the 2017 disasters had highlighted some weaknesses in the region regarding this issue.
585. CTO suggested that clear policies were needed to deal with foreign nationals during an emergency, in view of structural changes in how the tourism market is structured. Some hotels were not members of an association of national hotels. Some privately owned accommodation facilities were not formally registered. Sharing economy platforms, such as Airbnb, had further decentralized the tourist economy. As such, it was challenging for public agencies to know where tourists were in the country. In this context, a point raised at the national consultation was the need for the national emergency management authorities to be able to access immigration information – systems which were not currently integrated.
586. Another issue raised by CTO was the need to agree how to deal with repatriation of nationals from other OECS states. The Revised Treaty of Basseterre Establishing the OECS Economic Union, signed on 18 June 2010 in St. Lucia, establishes a single financial and economic space within which goods, services, people, and capital move freely, monetary and fiscal policies are harmonized, and countries continue to adopt a common approach to trade, health, education, and environment, as well as to sectoral development in agriculture, tourism and energy.²⁶³ With free movement of labour, national authorities potentially faced difficulties in assuring repatriation of fellow OECS nationals. Box 33 highlights recommendations made by the World Travel and Tourism Council on policy initiatives to support recovery and resilience.
587. In November 2017, United Nations World Tourism Organization (UNWTO) members met and issued the Montego Bay Declaration. This (UN-WTO) Declaration is a 15 (fifteen) point commitment to greater regional cooperation, improved crisis preparedness, and a blue economy approach to growth. It seeks to move to more resilient and inclusive tourism that sustains both environment and people of small island states, with tourism creating shared value. Three points of the declaration of relevance for disaster recovery and resilience are as follows:
- Point 9: Governments, the UN system, global and regional financial institutions and the private sector shall cooperate to promote safe, secure and seamless travel and build resilience for tourism by advancing crisis preparedness and management capabilities as well as the full integration of tourism in emergency structures;
 - Point 13: Governments, private sector, donors and the international and regional organizations shall support the development of a blue economy considering the specificities and vulnerabilities of Islands States in terms of natural resources, impact of climate change and extreme weather events as well as the high reliance of tourism on the ocean for marine activities, transportation, coastal protection and resilience.
 - Point 15: Governments, private sector, donors and the international and regional organizations shall support the establishment of a Global Tourism Resilience Centre in the Caribbean, including a Sustainable Tourism Observatory, to assist destinations' preparedness, management and recovery of crises which impact tourism and threaten economies and livelihoods.²⁶⁴
588. Disasters pose a significant fiscal burden to government budgets, although few studies examine impacts of disasters on debt. Specifically, several ministries and agencies expressed that natural disasters adversely affected national debts. There is a regional assessment to explore this issue. Though the government of Saint Lucia has developed an integrated disaster risk management program, fiscal deficits and debt accumulations, many of which stem from previous disasters, have forced the government to rely on ad hoc budget reallocations and donors' emergency assistance.

Trade Issues in Resilience

262 "2018 Article IV Consultation – Press Release, Staff Report, and Statement by the Executive Director for St Lucia", Jun 2018, IMF Country Report No. 18/179 Available at: <https://www.imf.org/-/media/Files/Publications/CR/2018/cr18179.ashx>.

263 The Treaty of Basseterre created the Organisation of Eastern Caribbean States with the goal of promoting cooperation and economic integration in the Eastern Caribbean. The OECS came into being in 1981, with Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines as members, and Anguilla and the British Virgin Islands are associate members. Source: Trade Policy Review, Report by the Secretariat OECS-WTO Members WT/TPR/S/299 Available at: https://www.wto.org/english/tratop_e/tpr_e/s299_e.pdf.

264 "Montego Bay Declaration on Jobs and Inclusive Growth: Partnerships for Sustainable Tourism on the occasion of the International Year of Sustainable Tourism for Development 2017", 29 November 2017. United Nations World Tourism Organization, Available at: http://cf.cdn.unwto.org/sites/all/files/pdf/jamaica_declaration_final_clean.pdf.



Box 33: Tourism and Natural Disasters

Travel & Tourism is one of the most important economic sectors in the Caribbean. The 46.7 million international visitors who came to the region in 2016 spent US\$31.4 billion which supported a total of \$56.4 billion in GDP and 2.4 million jobs. Meanwhile, the domestic market generates more than 25% of the region's Travel & Tourism GDP.

Overall, Travel & Tourism contributes 15.2% of the Caribbean's GDP and 13.8% of employment. However, in many Caribbean countries, the sector accounts for over 25% of GDP – more than double the world average of 10.4%. In the case of the British Virgin Islands (BVI), the sector contributes 98.5% of GDP – the highest share of any country worldwide.

It is therefore vital to the Caribbean economy that Travel & Tourism recovers as quickly as possible from the damage caused by the unusually severe hurricanes of 2017 – most notably Hurricanes Irma and Maria in September. They had a major impact on popular tourist destinations such as the BVI and Puerto Rico, although around two thirds of the region avoided any damage.

In the view of the World Travel and Tourism Council, governments across the region can work together and with the private sector to speed up recovery through a range of policy initiatives including:

- increasing access to capital for SMEs, and easing entry and work permit restrictions for specialised services, which will incentivise the private sector to speed up recovery;
- increasing duty-free exemptions on commonly-purchased goods and reduce tourism costs such as departure taxes and resort fees, which will stimulate travel and traveller spending;
- improving the ease and experience of traveller arrivals and departures, though use of technology in airports and visa facilitation, which will increase customer satisfaction and the attractiveness of the region;
- investing in tourism sector training and education to sharpen and upgrade the skills of temporarily displaced workers, which will ensure the sector has access to a skilled workforce as it recovers and grows;
- improving connectivity between islands, which will increase the competitiveness of the Caribbean as a destination and spread the benefits more widely;
- providing trip insurance when conditions in the host destination are unstable, which will encourage visitors to continue to visit; and
- adopting a specialised approach to marketing and public relations, including establishment of a long term messaging strategy, creating a rainy-day fund for tourism marketing and supporting regional tourism marketing programmes.

Source: World Travel and Tourism Council²⁶⁵

589. Stakeholders at the national consultation discussed the macroeconomic impacts of disasters. Department of Finance pointed out that public debt rose after the hurricanes. Natural disasters affect government debts through increased expenditure as well as decreased revenues. Department of Finance mentioned that several measures, such as Caribbean Catastrophe Risk Insurance Facility (CRRIF), contingency funds, international assistance, government reserves, and bonds, mitigate the pressure from disasters on public debt. Several stakeholders argued that high public debt limits financing options for disaster risk management. To maintain the sustainability of St. Lucia's budget, grant financing needed further scaling-up.

590. Debt sustainability was also a topic discussed at a meeting with the Caribbean Development Bank. In their view, financial buffers were vital for disaster response and recovery in the view of CDB, otherwise

disasters continue a vicious circle of deteriorating debt sustainability. The Caribbean Development Bank supports member countries to mitigate effects of disasters on debt by providing various forms of financial support, including assisting in saving funds, helping building resilience, and providing policy-based loans for exogenous shocks. For example, the Community Disaster Risk Reduction Trust Fund finances community-based disaster risk reduction and climate change adaptation initiatives at the local level. In July 2014, the CDB also launched a Natural Disaster Risk Management Programme to reduce vulnerability to the long-term impacts of natural hazards, by strengthening regional, national and community-level capacities for preparedness, management and coordinated interventions.

591. In the view of the IMF, high public debt and limited risk-transfer instruments suggest that self-insurance has a key role in preparing for natural

265 "The Impact of the 2017 Hurricane Season on the Caribbean's Tourism Sector", April 2018, World Travel and Tourism Council Available at: <https://www.wttc.org/-/media/files/reports/2018/caribbean-recovery-report---executive-summary.pdf>.

disasters. Considering the historic cost of disasters and their expected intensification, a savings fund of 5 percent of GDP, with a strong governance framework, would provide the necessary resources for relief and reconstruction without increasing public debt when disasters occur. Revenues from

the Citizenship-by-Investment program (CIP) and the new residency program, together with receipts from a carbon tax, could be used to finance this fund. IMF 2018.²⁶⁶ Box 34 below discusses policy trade-offs in building resilience. (IMF 2018).²⁶⁷

Box 34: Policy Trade-Offs in Building Resilience to Natural Disasters

Despite the surge in donors' assistance that follows these events, disasters leave deep scars in the fiscal position, with public debt increasing and little fiscal space left for government programs, including climate-related ones. Building resilience is therefore necessary not only to reduce the human, social, and economic costs associated with climate and natural disasters, it is also a way to exit the vicious circle of natural disasters/high public debt that St. Lucia has experienced with many other countries in the region.

Building resilience is key to cope with natural disasters. A do-nothing policy delivers dramatic negative outcomes in the economy, with large permanent losses of capital, output, and growth and a much larger increase in taxes. Financial protection and structural protection are key elements of a two-pronged strategy to build resilience.

- Financial protection is a combination of self-insurance, risk-transfer instruments, and other financial tools that provide the government with the necessary liquidity immediately after the event for relief purposes as well as resources to finance promptly the reconstruction. For a country like St. Lucia, which needs fiscal adjustment to attain debt sustainability, non-debt-creating instruments like insurance and self-insurance are most important. Financial protection has the additional benefit of reducing the government's contingent liabilities and building buffers that improve sustainability and reduce the risk premium on public debt.
- Structural protection is a series of actions that facilitate adaptation to climate change and minimize the impact of natural disasters. These include investment in resilient infrastructure and roadways, water supply systems, land use planning and management, and agriculture. The additional advantage of structural protection is a more resilient capital stock, which reduces the cost of capital and stimulates private investment.

IMF research examines potential trade-offs between the different policy approaches. It suggests structural protection for St. Lucia is the preferred policy if the government can reconstruct at least 85 percent of the destroyed public capital stock before the next disaster hits. Should the government's ability to reconstruct public capital be lower, the financial protection policy would lead to a lower output loss. Moreover, low efficiency of public investment would further reinforce the advantage of financial protection. This conclusion can be generalized to countries where financial constraints are prevalent and efficiency in public investment procedures is low. While the paper analyses two stylized policies, these policies are complementary and both required for an optimal strategy for building resilience.

Source: IMF 2018²⁶⁸

592. St. Lucia has a well-developed insurance industry, although under-insurance is the norm. All mortgaged properties must carry property and life insurance. Most insurers issue natural catastrophe coverage as extensions or endorsements of existing fire and allied perils policies. However, the majority of the residential property stock (80 percent) is currently not insured against natural disasters, given the perceived high cost. For businesses, the Financial Services Regulation Authority considers that under-insurance is also likely to be a significant problem, given the relatively low median income of local entrepreneurs. Under-insurance creates fiscal risk in the form of a possible contingent liability to government. (IMF 2018).²⁶⁹

593. Under-insurance of public assets slows reconstruction after disasters. Most public assets in St. Lucia, including critical buildings such as hospitals and schools, are not currently insured against natural disasters. Parastatals purchase insurance outside of the oversight of the central government and there is no centralized body that monitors the insurance of public assets. A sampling of 10 parastatal insurance premium payments shows that premium payments rose by 800 percent after Hurricane Thomas in 2010. (IMF 2018).²⁷⁰

594. St. Lucia has an innovative insurance scheme for low-income individuals. Low-income individuals in St. Lucia are eligible for insurance from wind and excess rain through the Livelihoods Protection Policy, a weather-index based insurance policy

266 " 2018 Article IV Consultation – Press Release, Staff Report, and Statement by the Executive Director for St. Lucia", Jun 2018, IMF Country Report No. 18/179 Available at: <https://www.imf.org/-/media/Files/Publications/CR/2018/cr18179.ashx>.

267 Ibid.

268 Ibid.

269 Ibid.

270 Ibid.



launched by the Munich Climate Insurance Initiative in partnership with the Caribbean Catastrophe Risk Insurance Facility (CCRIF) in 2013. Thirty-one individuals in St. Lucia received pay-outs totalling US\$102,000 on their Livelihood Protection Policies due to Hurricane Matthew. The program provides swift cash pay-outs following extreme weather events (high winds and heavy rain), enabling policyholders to recover quickly. The product is available across the island through local distribution channels, including co-operative banks, credit unions, and farmer associations.

595. Through CCRIF, St. Lucia pays US\$2.42 million for an annual premium, and at maximum, the country can receive a pay-out of US\$66.6, close to 4% of GDP (IMF, 2018). The state received pay-outs of US\$1 million for an earthquake in 2007 and US\$3.2 million for Hurricane Tomas in 2010 (IMF, 2018). After a declaration of a state of emergency, the Government can also receive up to US\$1 million immediately as part of the Contingency Emergency Response Component (CERC) of the World Bank's Disaster Vulnerability Reduction Project (DVRP) (IMF, 2018). Additionally, St. Lucia is working with the World Bank towards a catastrophe deferred drawdown option (Cat DDO) of US\$20 million (IMF, 2018). The Cat DDO is an ex-ante financial tool that provides rapid disbursement of funds after the declaration of a state of emergency due to natural or health disasters (IMF, 2018).

596. Saint Lucia's market is open to "reinsurance services" according to the country's General Agreement on Trade in Services (GATS) schedule. It is possible to provide reinsurance services to Saint Lucians on a cross-border basis without a commercial presence. Saint Lucians can also subscribe to foreign based reinsurance companies without restrictions. The schedule includes market access limitations for foreign reinsurance companies wishing to establish a commercial presence in Saint Lucia. The schedule states that "only corporate entities are allowed to conduct insurance business in St. Lucia. All such entities must first be registered by the Registrar of Insurance". Market access for foreign persons wishing to work in the reinsurance sector in Saint Lucia are subject to horizontal limitations concerning work permit regulations. Saint Lucia's horizontal limitation in mode 4 notes inter alia that "the issue of permits is normally confined to persons with specialized managerial and technical skills and the administration of the regime is normally guided by a labour market test".

597. The government of St. Lucia has developed institutions to respond to disasters over the last two decades. The governing legislation for disaster risk management includes 1) the Emergency Powers

Disaster Act in 1995, 2) the Disaster Preparedness and Response Act No. 13 (2000) and its Amendment Act, 3) the Disaster Management Act No. 30 of 2006. Furthermore, in 2006 the National Emergency Management Organization (NEMO) was established. NEMO administers all aspects of disaster risk management, including planning, mitigation, response, damage assessment, and reconstruction, based on the 2007 National Disaster Management Plan. The budget of NEMO is about US\$240,000 a year (0.01 percent of GDP), with an additional budget for an initial response to any declared disaster. The central role of NEMO is to coordinate different stakeholders, ministries, and agencies. The Chamber of Commerce and several industries participate in NEMO's meetings and councils.

598. The World Bank, the Caribbean Development Bank (CDB), the Japan International Cooperation Agency (JICA) and others have funded a sequence of projects to strengthen emergency preparedness, enhance early warning systems, and build communities' capacity to manage disasters. In light of progress made, and lessons from recent disasters, current World Bank and European Union support is putting more weight on making infrastructure resilient (e.g., school buildings and bridges). (IMF, 2018).²⁷¹ Another example of support from development partners is the Natural Disaster Risk Management Program, a €20 million initiative of the group of African, Caribbean and Pacific States, funded by the European Union. The program supports disaster risk reduction and climate change adaptation activities in CARIFORUM countries. This initiative started in July 2014 and is being implemented by the CDEMA in collaboration with the Caribbean Development Bank and the Government of the Dominican Republic. The Program seeks to strengthen the capacities of authorities and other organizations at the national, regional and community levels to carry out coordinated interventions and provide timely responses to the challenges imposed by natural disasters and the effects of climate change.

599. During the national consultation meetings, several stakeholders and policymakers agreed on the significance of the private sector in building resilience. Notably, the development of insurance market is needed to increase the resilience. Regarding government procurement, it was noted that the Government was also amending its public procurement legislation, which can strengthen the efficiency and flexibility of emergency public procurement after disasters.

600. The Cariforum Economic Partnership Agreement contains a chapter on government procurement, which aims at promoting non-discrimination,



271 Idem.

transparency and predictability.²⁷² The chapter sets out principles and minimum transparency rules that procuring entities should respect when tendering. These rules apply to contracts over a US\$200,000 threshold tendered by central authorities. In practice, most OECS government procurement is not covered by these provisions.²⁷³

601. Several participants at the national consultation underscored the critical importance of business continuity planning for governments and businesses. They argued that more efforts were needed for governments and companies to continue operations and businesses during disasters. NEMO

in turn highlighted there were high demand for business continuity planning in hotel, power, bank industries. The Chamber of Commerce indicated that they wanted to provide their members with training opportunities on business continuity planning and risk analysis.

602. One comment made was that most government departments lacked business continuity plans. Such plans would also prove useful in the face of other hazards, such as electricity outages or computer network hacks that could disable government systems. The example of electronic customs clearance systems was given.

Box 35: International Standards, Disaster Risk Reduction and Business Continuity

The United Nations Economic Commission for Europe (UNECE) and the International Organization for Standardisation (ISO) are two organizations involved in the development of standards for disaster risk reduction and business continuity.

UNECE works with standards-setting organizations to make standardized guidelines supporting disaster risk reduction more readily available and accessible. UNECE has developed a booklet on Standards for Disaster Risk Reduction to encourage their use by business and in regulatory practice and policy-making. This booklet outlines voluntary standards for: the prevention of disaster risks, for the management of disaster risks and crisis management in regulatory frameworks was published in 2015.²⁷⁴ On 15 November 2018, the UNECE Working Party on Regulatory Cooperation and Standardization adopted a recommendation on "Standards and Regulations for Sustainable Development" which aims to standardize language on managing risks in regulatory systems. UNECE is engaged in disaster preparedness in five areas: standards and regulatory frameworks, housing and land management environmental management, measurement and statistics, and protective functions of forests.

Assurance that appropriate business continuity arrangements in place is an area that ISO has addressed. Responding to inter-dependence of business and the need that key suppliers and partners would continue to provide key products and services, even when incidents occurred, ISO developed ISO/TC 223, Societal security, and ISO 22301:2012, Societal security – Business continuity management (BCM) systems – Requirements. ISO 22301 is a management systems standard for BCM which can be used by organizations of all sizes and types. These organizations will be able to obtain accredited certification against this standard and so demonstrate to legislators, regulators, customers, prospective customers and other interested parties that they are adhering to good practice in BCM.²⁷⁵

Source: UNECE and ISO

603. A point made during the national consultation was the significance of data protection for disaster preparedness. Some sectors, for example, the telecom industries, held disaster drills to protect their data. Other sectors were far more vulnerable from the perspective of data protection, with primary data centres located at a sea level. Alternative site and cloud-storage was important to mitigate the impact of natural disasters. They also pointed out that there was not sufficient consciousness about data backup and management. NEMO has entered discussions with other government departments and companies to mitigate outage and disasters.

604. Several stakeholders asserted that rigorous implementation of the building code, under the responsibility of the Ministry of Physical Planning, was essential to mitigate risks. Some others noted that affordability of housing was a constraint. The Government is attempting to make housing more affordable and resilient so as to reduce contingent liabilities caused by disasters by improving the mortgage market so as to allow more poor households to access housing loans.

605. Several stakeholders, notably in from the Ministry of Agriculture indicated the significance of climate and weather forecasting for disaster resilience. The importance of meteorological systems was

272 "Economic Partnership Agreement between the CARIFORUM States, of the one part, and the European Community and its Member States, of the other part", 30.10.2008 Official Journal of the European Union, L 289/I/4 Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:289:0003:1955:EN:PDF>.

273 "Trade Policy Review, Report by the Secretariat: OECS-WTO Members", 22 September 2014, WT/TPR/S/299/Rev.1.

274 "Standards for Disaster Risk Reduction 2015", UNECE, Available at: https://www.unece.org/fileadmin/DAM/trade/Publications/ECE_TRADE_424_Standards_and_DRR.pdf.

275 "Business continuity – ISO 22301 when things go seriously wrong", Stefan Tangen and Dave Austin, 18 June 2012, ISO website. Available at: <https://www.iso.org/news/2012/06/Ref1602.html>.



highlighted in three respects: regional forecasting for the Caribbean, local meteorological forecasting, and early warning systems for floods for the agriculture sector. While weather information and modelling have improved tremendously in past years, forecasting for small island states remains a major challenge. Regional and national weather forecasting needs to improve by focusing on the impact of specific weather forecasts rather than generalised forecasts.²⁷⁶

606. Sargassum Institute highlighted the economic value of the services they offer to the region. One example given was the Tourism-Climatic Bulletin. This bulletin is an operational tool jointly developed and disseminated by the Caribbean Tourism Organization, the Caribbean Hotel and Tourism Association and the CIMH. The provides a broad overview of climate conditions (how wet, how dry, how hot etc.) in the Caribbean and source markets (in North America and Europe) and communicates implications for the tourism sector three months in advance. Use of this tailored climate early information can inform strategic and operational decisions related to the use of environmental resources, marketing, and enhancement of the visitor experience. For example, weather predictions for key tourist source markets can be used to target advertising and marketing expenditure.

607. The CIMH is also involved in a number of development projects in the region, working with various funding agencies. Examples include the EU funded Caribbean Agrometeorological Initiative to increase and sustain agricultural productivity at the farm level in the Caribbean region through improved dissemination and application of weather and climate information. Another project in which CIMH is engaged is in a Japan-funded Real-Time Flood Forecasting Project that couples a physically based hydrological model capable of capturing changes in watershed characteristics to a numerical weather prediction model. The project aims to get around the short time lag between precipitation events and the onset of project led by McGill University's Brace Center for Water Resources Management to address the complex challenges of water management.²⁷⁷

608. Another area CIMH mentioned was in respect of prediction of Sargassum seaweed blooms. Since 2011, rafts of Sargassum, a brown seaweed that lives in the open ocean, have washed up on beaches across the Caribbean. The seaweed rafts have negatively impacted on fisheries (e.g. trapping sea turtles) and tourism (blocking beaches and emitting unpleasant odours). Satellite imagery is key to tracing the currents and weather patterns driving the Sargassum across the Atlantic and toward the Caribbean.²⁷⁸

276 "Dominica Lessons Learned from Tropical Storm Erika", October 2017, Assessment Capacities Project.(ACAPS), https://www.acaps.org/sites/acaps/files/products/files/20171024_acaps_dominica_lessons_learned_tropical_storm_erika.pdf.

277 Caribbean Institute for Meteorology and Hydrology website, <http://rcc.cimh.edu.bb/>.

278 "Mysterious masses of seaweed assault Caribbean islands 11 June 2018, Katie Langin, Science Magazine. Available at: <http://www.sciencemag.org/news/2018/06/mysterious-masses-seaweed-assault-caribbean-islands>.



Appendix 1: List of organizations and persons consulted

DOMINICA

The following persons and organizations were consulted:

27 August 2018

- Parry B. Bellot, Managing Director, Parbel Enterprises
- Kimone George, Proprietor/Partner, Island Safety Supply
- Kenneth Brunex
- Curtis Gordon
- Frances Hamillon
- Beruard Ellenolfe
- Nakima Royer Jno Baptiste, Chief Executive Officer, Digicel (Dominica) Limited
- Bertilia McKenzie, General Manager, Dominica Electricity Services Ltd. (DOMLEC)
- Kevin Hagen, Project Manager, EWB
- Priiscilla Bannis, Board Member
- Kertist Acquistus, Secretary Treasurer
- Paul Bara, Financial Adviser
- Hathehaon J. Waceer
- Norman Rolle, Managing Director

28 August 2018

- Severin McKenzie -Nature Island Paper Products
- Nakima Royer Jno Baptiste, Chief Executive Officer, Digicel (Dominica) Limited
- Riviere D. Sebastian, Chief Fisheries Officer, Fisheries Division, Ministry of Agriculture and Fisheries
- Marvlyn Alexander James – Fort Young Hotel
- Deles Warrington, Farmer, Calibishie
- Jacqueline Douglas, Farmer/Hotelier, Hampstead
- Simpson Gregoire, Manager, Campbell's Business Systems
- Yves Joseph – Macousherie Estates (Distillers)



SAINT LUCIA

A programme of consultations was organized by the Ministry of Commerce, Industry, Investment, Enterprise Development and Consumer Affairs. The following persons and organizations were consulted:

29 August 2018

- Benjamin Emmanuel, Cabinet Secretary
- Maria Medard, Deputy Director (Ag.), National Emergency Management Organization (NEMO)
- Velda Joseph, National Emergency Management Organization
- Sophia Emmanuel, Budget Office
- Jhea Hyancnil, Budget Office
- Mathurin- fiscal
- Nadine Isidore, Economist, Department of Economic Development
- Theruina Andreial, Economist, Research and Policy
- Barry Innocent – Deputy Director Agriculture
- Cletus Thomas- Customs and Excise
- Christopher Roberts, Project Coordinator, Caribbean Regional Communications Infrastructure Program
- Keats Compton, President, Marine Industries Association of St. Lucia
- Leo Titus Preville, Permanent Secretary, International Trade, Investment, Enterprise Development and Consumer Affairs, Department of Commerce.
- Hon. Ian Douglas, Minister of Trade, Energy and Employment

30 August 2018

- Albert Sandy, Permanent Secretary, Caribbean Customs Law Enforcement Council
- Brian Lowsy,
- Goerge Hecee, Agricultural Specialist, OECS Commission.
- Virginia Paul, Head Trade Policy Unit, Economic Affairs Regional Integration Division, Organisation of Eastern Caribbean States
- Allan Paul, Regional Trade Advisor, OECS Hub
- Joan John-Norville, Environment Sustainability Cluster, OECS
- Voronica Mufudza, Trade Advisor, OECS Commission

BARBADOS

A series of meetings were held with the following persons from regional organizations:

1 September 2018

- Dr. Justin A. Ram, Director, Economics, Caribbean Development Bank;
- Malcolm Spence, Senior Coordinator, Intellectual Property, Science and Technology Issues and Dr. Chantal Ononaiwu, Caricom Secretariat;
- Dominica Ronald Jackson, Executive Director, Caribbean Disaster Emergency Management Agency;
- Ryan Skeete, Director, Research, Charlene Drake, Executive Coordinator, Office of the Secretary-General, Amand Charles, Sustainable Tourism Development Specialist, Caribbean Tourism Organization;
- Kathy Ann Caesar and Dr. Cédric Van Meerbeeck. Caribbean Institute for Hydrology and Meteorology





Executive Summary – Tonga, Vanuatu and Fiji



TONGA, VANUATU AND FIJI

Executive Summary

Hazard Exposure

609. Pacific island countries (PICs) are vulnerable to a broad range of natural disasters stemming from hydro-meteorological (such as cyclones, droughts, landslide and floods) and geo-physical hazards (volcanic eruptions, earthquakes and tsunamis). In any given year, it is likely that Fiji, Tonga and Vanuatu are either hit by, or recovering from, a major natural disaster.
610. The impact of natural disasters is estimated by the Pacific Catastrophe Risk Assessment and Financing Initiative as equivalent to an annualized loss of 6.6% of GDP in Vanuatu, and 4.3% in Tonga. For Fiji, the average asset losses due to tropical cyclones and floods are estimated at more than 5%.
611. In 2014, Tropical Cyclone (TC) Ian caused damage equivalent to 11% to Tonga's GDP. It was followed in 2018 by damage close to 38% of GDP from TC Gita. In 2015, category five TC Pam displaced 25% of Vanuatu's population and provoked damage estimated at 64% of GDP. In Fiji, Tropical Cyclone Winston affected 62% of the population and wrought damage amounting to 31% of GDP, only some three and a half years after the passage of Tropical Cyclone Evan.
612. Vanuatu and Tonga rank number one and two in global indices of natural disaster risk. Seismic hazard is an ever-present danger for both, together with secondary risks arising from tsunamis and landslides. Some 240 earthquakes, ranging in magnitude between 3.3 and 7.1 on the Richter Scale, struck Vanuatu and its surrounding region in the first ten months of 2018. Eruptions of the Manaro Voui volcano and subsequent evacuations of Ambae Island evidence the hazard with which national authorities must contend. Eruptions of a submarine volcano in Tonga's Ha'apai island chain have added a new island of significant scientific and tourist interest.
613. Climate change is likely to increase the intensity of risk and associated losses from hydro-meteorological hazards. One hazard that may increase in frequency, but which is generally less-researched, is that of drought, and its impact on agricultural production and trade. The economic burden of small storms and localized events (such as flooding or minor earthquakes) also tends to be neglected.

Impact on Economic Growth and Trade

614. Frequent natural disasters exacerbate the economic and development challenges faced by the Pacific Island countries. These constraints include geographical remoteness, narrow production bases and small populations. High transportation

costs are a drag on competitiveness and raise the cost of disaster response.

615. Natural disasters exert downward pressure on economic growth and are often debt-creating. Cyclone Gita reduced Tonga's GDP from a predicted 3.4% to 0.4% in 2018. In Fiji, TC Winston caused a reduction in economic growth of 2.5%. Vanuatu's economic growth dropped 2.8% percentage points in the year of Cyclone Pam. The storm also pushed back Vanuatu's expected graduation from LDC status by three years. In December 2017, the UN Committee on Development Policy recommended that Vanuatu's smooth transition process should seek to reduce the country's vulnerability to natural disasters ahead of Vanuatu's planned LDC graduation on 4 December 2020.
616. Reconstruction activity is an important economic stimulus in the aftermath of disasters. However, it can exert pressure on the current account. In Vanuatu, the stock of public debt to GDP increased by 20 percentage points after Cyclone Pam to reach 48.8% in 2016 – on a par with the 47.3 projected for Fiji and 43.2% for Tonga in 2018.
617. Reconstruction and recovery efforts after disasters reduce resources available for productive investment, further tighten limited government budgets, and create higher debt risk. IMF projections of PICs debt sustainability worsens if exposure to future natural disasters are included. Vanuatu's current account deficit is expected to widen to around 9% of GDP in 2017 and 2018, without transfers of official development assistance, external debt in Tonga and Vanuatu would far higher. Fiji's current account deficit widened to 5.0% of GDP in 2016 following TC Winston.
618. Trade plays a vital role in the economies of the three PICs surveyed in this report. The ratio of trade (exports plus imports of goods and services) to GDP has grown significantly in both Tonga and Vanuatu. Vanuatu's total trade as a share of GDP increased by 28 percentage point from 78.4% in 2000 to 106.4% in 2016. The trade to GDP ratio for Tonga jumped 42.2 percentage points to reach 95.7% over the same period. Trade is integral to economic growth and development. It is also an important factor in disaster response, recovery and resilience.

Policy Issues

619. Successive tropical cyclones have led to lessons being learnt by both governments and relief organizations in disaster response. An issue that arose in the responses to both Tropical Cyclones Winston and Pam was the accumulation of unwanted relief items, "unsolicited bilateral donations" (UBDs). These consignments delayed the timely clearance of relief items through customs and other border controls and meant government incurred storage and disposal costs. Of the UBDs sent to Vanuatu, 50% of food items



- were expired by the time they were accessed and had to be destroyed.
620. A push to "cash, not goods" reduced problems with unsolicited items in response to TC Gita in Tonga and TC Donna in Vanuatu. Lessons learnt by national emergency management offices and key relief actors may be another explanatory factor.
621. Another important dimension to the response in Tonga is that telecommunications and digital connectivity were not lost during or in the aftermath of TC Gita. Tongans affected were able to communicate their needs, for example through social media, to family and diaspora members overseas, ensuring that relief consignments (including those sent by the business community) had an addressee and met a real need.
622. The government's customs duty exemption policy encouraged assistance from the Tongan diaspora. It also sought to stimulate construction services through the exemption of duties and charges on building materials for household and business use. This targeted approach compares favourably with the more blanket customs exemption policies used in response to other cyclones.
623. A further factor to consider in the response to TC Gita is the important role played by remittances. Remittances accounted for 26.6% of Tonga's GDP in 2016. Diaspora remittances helped lessen the distress caused by disaster events. For small businesses, remittances also contributed to business liquidity. Income remitted from overseas has been a factor in the expansion of imports, particularly for consumption purposes. Imports as a percentage of GDP jumped 15.2% between 2000 and 2016 to reach more than 60% in Vanuatu. The increase was even more pronounced for Tonga with imports as a share of GDP growing by 35% to 74.1% over the same period. Moving to cash for disaster relief may not mean fewer imports.
624. Ensuring that customs and other border clearance procedures operate efficiently and promptly, including in disaster situations is an area where trade facilitation reforms may help including implementation of the WTO Trade Facilitation Agreement.
625. Natural disasters have proven a set-back in efforts to diversify merchandise exports, notably in the agriculture sector – a sector that has suffered significantly from hydro-meteorological events. In addition to production losses, often in niche fresh products with narrow export windows, tropical cyclones have broken critical links in fresh produce value chains. These links are critical to gain and maintain market access to high value regional markets with demanding biosafety controls. Business solidarity in the reconstruction of damaged pack houses and quarantine treatment facilities is a welcome recognition of this critical link.
626. Sanitary and phytosanitary risks also present a significant barrier to the realization of commercial value from storm waste e.g. timber from commercially valuable fallen trees. With a high proportion of merchandise exports originating in the agriculture sector drops in exports have been precipitous (37% in Vanuatu after Cyclone Pam) and slow to recovery particularly for market segments with long production cycles e.g. tree crops. Factors such as power outages, access to credit and slow pay-outs of insurance claims have also constrained recovery in manufacturing and services including tourism.
627. The resilience of services, particularly tourism is positive, not least given the scope for diversification in outbound source markets. Investment in runway and airport upgrading should help airlift capacity during disasters and rekindle demand in traditional markets. Expansion of insurance coverage would support resilience but may require need action to reassure global reinsurance markets about contingent liabilities.
628. In concluding remarks at the 2018 WTO Trade Policy Review, the delegation of Vanuatu suggested that the trade and economic implications of natural disasters were a trade concern that should be addressed on its own merits." Learning from the experience with integrating health objectives into tariff policy, a similar approach could be piloted for disaster resilience. Similar considerations could also be applied in government procurement.



Introduction

629. Between 1950 and 2011, extreme weather-related events in the Pacific Islands region affected approximately 9.2 million people and caused economic damages of around US\$3.2 billion. Recent estimates show that expected losses due to natural disasters on an annualized basis in the Pacific far exceed those in almost all other countries in the world. The economic costs of natural disasters are high for most PICs—on average between 0.5 to 6.6% of GDP is lost annually – and climate change will increase vulnerabilities. For example, the impacts of natural disasters is equivalent to an annualized loss of 6.6% of GDP in Vanuatu, and 4.3% in Tonga.²⁷⁹
630. Natural hazards affect Pacific Island Countries (PICs) differently. Whereas atoll island nations outside the cyclone belt and seismic zones are more affected by slow-onset events, such as saline intrusions and coastal erosion, rapid-onset disasters are frequent occurrences in the high-volcanic islands. Overall, hydro-meteorological disasters cause most economic losses, whereas geo-hazards are by far the major cause of human loss. (World Bank 2017)
631. Between 1981 and 2016, there were 32 Category Four and 27 Category Five cyclones. Tropical cyclones have traditionally been the most serious climate hazard for PICs in terms of total damage and loss. Vanuatu is the most at risk from cyclone events, and is expected to lose, on average, US\$36.8 million annually.
632. Annual costs of coastal adaptation and adaptation of infrastructure to changes in rainfall and temperature alone are predicted to range from US\$400 million to US\$1.2 billion by 2040, with the size of the range driven by the variability between climate scenarios used for the analysis, including on changes in temperature and rainfall as well as low and high estimates of likely sea-level rise. It is important to note that these costs reflect additional adaptation requirements due to projected climate-change impacts over the next 25 years on top of what is required to adapt to current weather conditions. (World Bank 2017)
633. Over the coming decades, tropical cyclones are expected to increase in intensity, although not necessarily in frequency. Rising sea levels increase the risk of storm surges and it is likely that seasonal droughts will continue to increase in intensity, and floods in both intensity and frequency. For some of the low-lying atolls such as Kiribati, the Marshall Islands, and Tuvalu, projections of sea-level rise imply that significant portions of their land area might become more exposed to storm surges and submerged, and that salinization will reduce the availability of fresh water resources. Climate change is also projected to affect the location and migration patterns of fish in the Pacific. (World Bank 2017)
634. Flood risk (from rainfall not associated with cyclones) is very significant in the region, often causing significant losses. For example, Fiji experienced devastating floods in 2004, 2009, 2012 (twice) and 2014. The 2009 event caused damages and losses of US\$135 million. The average asset losses due to tropical cyclones and floods are estimated at more than F\$500 million (US\$235 million) per year, representing more than 5% of Fiji's GDP. More recently, flash flooding in the Solomon Islands in 2014 caused damage and loss estimated at US\$108.9 million, equivalent to 9.2% of GDP, resulted in the death of 22 people and affected approximately 52,000 people in total. (World Bank 2017)
635. Coastal erosion, storm surges and king tides are major hazards affecting the coasts of the PICs. There are up to 30,000 islands located within the Pacific Ocean with a total coastline of over 50,000 km. According to a study of 12 PICs, 57% of the assessed built infrastructure is located within 500 meters of their coastlines, amounting to a total replacement value of US\$21.9 billion. (World Bank 2017)
636. Droughts also increasingly impact PICs. Water sources are vulnerable to the effects of El Niño and La Niña events²⁸⁰, which have the potential for significant water-related impacts for many communities across the region. Both the Federated States of Micronesia and the Marshall Islands declared a state of emergency due to the 2015-16 El Niño-induced drought. In the same event the price of kava rose 500% in Tonga due to drought damage to the kava crop. Another example of drought occurred in Tuvalu in 2011, which led to severe rationing of fresh water supplies. Water sources are vulnerable to the effects of El Niño events. Table 19 below indicates the occurrence of different hazards across the Pacific in the years 2015-2016. Higher impact events are shaded darker [i.e. those with a larger number of people affected, and total economic damage].

279 This section draws extensively on the following publication: "Pacific Possible: Long-term Economic Opportunities and Challenges for Pacific Island Countries", 2017, Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/168951503668157320/pdf/ACS22308-PUBLIC-P154324-ADD-SERIES-PPFullReportFINALscreen.pdf>.

280 El Niño refers to large-scale warming of surface water in the central and eastern equatorial Pacific Ocean and changes in the tropical atmospheric circulation [i.e. winds, pressure and rainfall]. La Niña refers to large scale cooling in the same zone. Source: World Meteorological Organization: <https://public.wmo.int/en/About-us/FAQs/faqs-el-ni%C3%B1o-la-ni%C3%B1a>.



Table 19: Occurrence of hazards across the Pacific (2015-2016 data)

Sub-region	Nation	Flood & Landslide	Drought	Tropical Cyclone
North Pacific	Marshall Islands			
	Micronesia			
	Palau			
Central Pacific	Kiribati			
	Niue			
	Samoa			
	Tonga			
	Tuvalu			
South Pacific	Fiji			
	New Caledonia			
	Papua New Guinea			
	Solomon Islands			
	Vanuatu			

Source: UNDP, ESCAP, OCHA 2017²⁸¹

637. Most of the population, urban centres and critical infrastructure are located on the coast and are, therefore, exposed to coastal hazards. For example, in November 1979, December 2008, and March 2014, extratropical storms caused large swell and flooding throughout Majuro, Marshall Islands and Tropical Cyclone Wilma cause destructive storm surges in Ha'apai (Tonga) in January 2011.

638. Many PICs are also situated within the Pacific "Ring of Fire" which aligns with the boundaries of tectonic plates, making them extremely vulnerable to earthquakes and tsunamis. The Solomon Islands, Tonga, and Vanuatu are the most at risk to earthquakes and tsunamis of all PICs. Vanuatu was affected by devastating earthquakes and tsunamis several times in the last few decades. In 1999, a magnitude 7.5 earthquake caused extensive damage to Pentecost Island, leaving more than 10 dead, over 100 injured and millions of dollars in losses. The earthquake generated a large tsunami, including a six-meter wave.

639. In 2002, a magnitude 7.3 earthquake struck near Vanuatu's national capital of Port Vila, causing millions of dollars in damage to buildings and infrastructure. More recently, in 2009, a devastating tsunami struck Samoa and Tonga following an 8.1 magnitude earthquake, resulting in waves reaching as high as 22 meters in Tafahi, Tonga which destroyed over 20 villages and caused 233 fatalities in Samoa (189), Tonga (9) and American Samoa (35). In 2013, a tsunami struck the Solomon Islands, following an 8.0 magnitude earthquake.

640. As part of the efforts to build an integrated and inclusive approach for resilience in the Pacific region, the Framework for Resilient Development in the Pacific: An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP) was adopted in 2016. The goal of the FRDP is to ensure an integrated approach, whenever possible, to addressing and managing climate change and disaster risk.²⁸² The implementation of the FRDP is done through the Pacific Resilience Partnership Taskforce. To ensure inclusive participation of a range of key stakeholders, the Taskforce comprises fifteen members, with five representing PICs and territories, five for civil society and private sector, and five for regional organisations and development partners.

641. The text that follows examines the impact of hydro-meteorological and geo-physical hazards on the economies of three Pacific Island States: Tonga, Vanuatu and Fiji. The analysis examines the record of disaster events, their impact on macroeconomic and trade performance, together with trade issues that have arisen in disaster response, recovery and resilience. Key insights are summarized in an executive summary. Research was undertaken at the end of May 2019 in support of this analysis for Tonga by Michael Roberts and Arne Klau for Vanuatu and Fiji. Emmanuel Orkoh, Nazia Mohammed and Wanjiku Waweru provided research and writing support for the analysis. Barbara Marcetich provided administrative support.

281 A multi-agency (UNDP, ESCAP, OCHA) study of lessons learnt 2017. Enhancing Resilience to Extreme Climate Events: Lessons from the 2015-2016 El Nino Event in Asia and the Pacific. Available at <http://www.unescap.org/sites/default/files/El%20Nino%20report-%20finalized%20ESCAP07082017.pdf>.

282 Framework for Resilient Development in the Pacific, An Integrated Approach to Address Climate Change and Disaster Risk Management (FRDP) 2017-2030. Available at: http://prdrse4all.spc.int/sites/default/files/frdp_2016_resilient_dev_pacific.pdf.



TONGA

Basic Facts

642. Tonga is a small, middle-income economy in the South Pacific, vulnerable to natural disasters. Geographical remoteness, high transportation costs, low diversification and connectivity, a narrow production base, and limited economies of scale place Tonga at a competitive disadvantage. Tonga's economy is highly dependent on remittance flows and donor grants, with agriculture and tourism being the main exports, posing sustainability challenges.²⁸³
643. Like many other small Pacific island nations, Tonga's economic growth potential is constrained by structurally high costs and exposure to economic and environmental shocks. Its location makes Tonga the most geographically remote nation from major centres of economic activity in the world.²⁸⁴ Over the last twenty years, per capita GDP has grown by 1.1% on average, compared to 2.3% globally. While this is lower than the average of any other developing region, it is faster than the small Pacific islands average (0.9%), illustrating the challenges faced by the region.²⁸⁵
644. Small size and remoteness combine to push up the cost of economic activity in Tonga, limiting the competitiveness of its exports of goods and services in world markets, and reducing the potential to realize economies of scale. Small size and remoteness also push up the cost of providing public services. High dependence on imports combined with a lack of sufficient size for meaningful diversification makes Tonga highly vulnerable to external economic shocks. These factors combine to make growth, inclusive or otherwise, particularly elusive in Tonga.²⁸⁶
645. Tongan businesses face challenges typical of small island economies, including geographic isolation, limited human and financial resources, a small domestic market, and high cost of doing business. Businesses have been vulnerable to three types of internal and external shocks: (i) natural disasters have severely impacted the local economy and businesses in the past, (ii) the last global financial crisis adversely impacted diaspora remittances and thus the flow of capital for local businesses, and (iii) the import-based economy is susceptible to external price shocks, which affect input prices for local businesses. Businesses view limited access to finance as a major impediment to business growth.²⁸⁷
646. Tonga's economy is highly trade dependent. Total trade as a share of GDP has risen by 42.2 percentage points from 53.5% in 2000 to 95.7% in 2017. Most of the growth has occurred in imports. Over half of Tonga's imports are food (with the main trading partners New Zealand and Fiji) and fuel (with Singapore the main source of refined petroleum products). Imports as a share of GDP has grown from 39.0% to 74.1% over the same period. Export growth has in contrast been tepid, with exports as a share of GDP increasing only from 14.5% to 21.7% between 2000--2017. Most merchandise exports are of agricultural produce.
647. Tonga acceded to the WTO in July 2007 with short transition periods to implement the WTO agreements on Customs Valuation and Trade-Related Aspects of Intellectual Property Rights-, and some reductions in tariffs. Tonga bound all its tariff lines, and no final bound rate exceeds 20%. Tonga undertook specific commitments under the General Agreement on Trade in Services (GATS) in 90 (of around 160) services subsectors.²⁸⁸
648. Remittances accounted for 26.6% of GDP in 2016.²⁸⁹ Remittances are a critical income source, and recent years have seen improved remittance growth following the expansion of overseas worker programs such as the Australian Seasonal Worker Program and the New Zealand Recognized Seasonal Employers Program.²⁹⁰ Remittances from expatriates provide a major boost to the local economy, and help explain why merchandise imports outstrip exports by a factor of at least 10:1 in any given year. In Tonga, remittances are used by relatives of emigrants to finance consumption, mostly of imported goods.²⁹¹

283 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

284 "Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909-TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

285 Ibid.

286 Ibid.

287 Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

288 "Tonga: Trade Policy Review, Review by the Secretariat", 27 February 2014, WT/TPR/S/291/Rev.1 Available at: https://www.wto.org/english/tratop_e/tp_r_e/tp_r_e.htm.

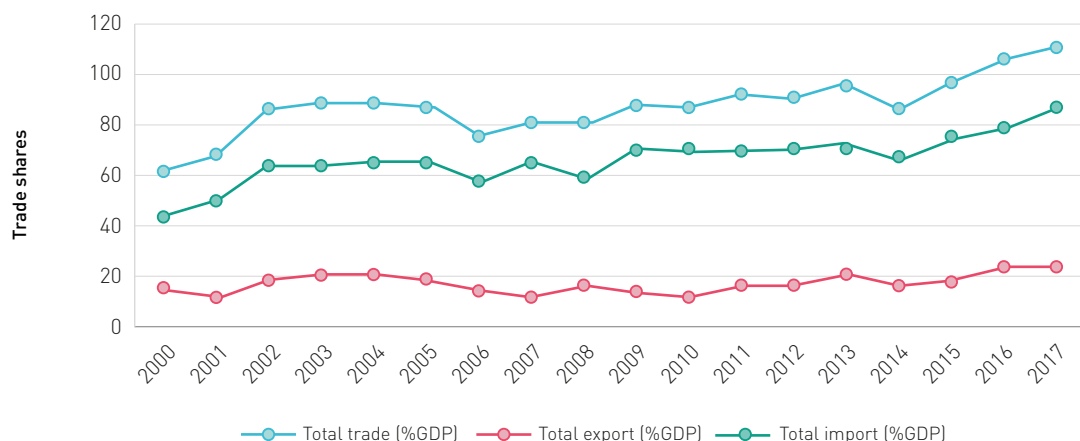
289 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

290 Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909-TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

291 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

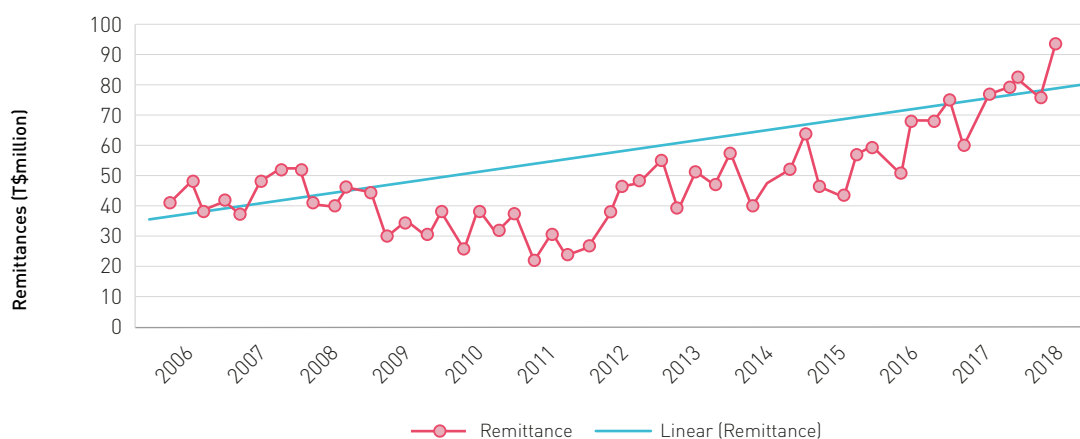


Figure 28: Imports, exports and total trade as a percentage of GDP



Source: WTO computation based on data from the World Bank

Figure 29: Growth of remittance receipts 2006-2018



Source: WTO computation based on data from National Reserve Bank of Tonga

649. The authorities estimate that the Tongan population is roughly matched by another 100,000 Tongans living abroad, mainly in New Zealand, Australia and the United States (Hawaii). The emigration of Tongans is reflected in a relatively low population growth rate (0.4% p.a. since 2006). It has also contributed to a shortage of skilled labour in some sectors, and low productivity growth.²⁹² Figure 29 below shows how remittance receipts have grown over the period 2006-2018.

650. Tonga's economic growth is driven by agriculture, construction and tourism.²⁹³ The country has

a narrow economic base that is led by the agriculture sector which accounts for 16 percent to GDP.²⁹⁴ Tonga has a very small manufacturing sector and modest tourism sector which has the potential for expansion. Construction and infrastructure projects funded by donor grants and soft loans have been the main drivers of the country's economic growth in recent years. The contribution of manufacturing output to GDP is relatively small (about 6%) and the sector continues to decline in importance, while imports increase. The main activity is food packing, processing and beverage production.

292 "Tonga: Trade Policy Review, Review by the Secretariat", 27 February 2014, WT/TPR/S/291/Rev.1 Available at: https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm.

293 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

294 "Pacific Community: The Tonga Agriculture Policy Bank", Available at: <https://pafpnet.spc.int/policy-bank/countries/tonga>.

651. The services economy contributes about 50% to GDP, with tourism playing an important role in supporting transport, hotels, commerce, and other services. The current account deficit is driven by construction cycles and largely financed by development grants and remittances. The current account deficit (after grants) as a share of GDP has varied between 3% and 1% of GDP in the last five years, peaking in years of large public sector construction works (e.g. 2012 and 2015). The current account deficit has been adequately financed by capital inflows.²⁹⁵

652. The population of 106,000 is dispersed across 36 of its 177 islands, with around one quarter of the population based in the capital of Nuku'alofa. Tonga's Gross Domestic product (GDP) per capita in 2018 was \$4,126, and its GDP growth of rate was 3.2%. The prevalence of extreme poverty is very low in Tonga, at 1.1% nationwide, which suggests there are fewer than 1,200 people in extreme poverty in the entire country. Poverty based on the \$3.10-a-day line is somewhat higher, at 8.2% of the population, with rural populations more likely to live in poverty than those in urban areas (9.1% compared to 4.9%). This is consistent with local views that while there are very few people in abject poverty in Tonga, "hardship" or

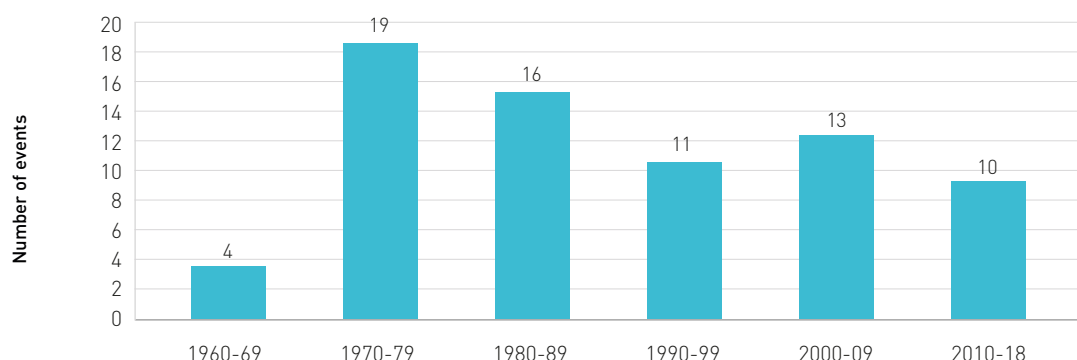
lack of cash for basic goods, is significantly more widespread.²⁹⁶

Exposure to Natural Disasters

653. Tonga is one of the most vulnerable countries to the effects of natural disasters and climate change. The country is ranked second (behind Vanuatu) as most disaster-prone country in the world, according to the 2016 World Risk Index.²⁹⁷ Its location within the Pacific Ring of Fire, which is aligned with the boundaries of tectonic plates makes the country susceptible to extreme seismic and volcanic activity, strong earthquakes and tsunamis. Frequent tropical cyclones also affect Tonga with damaging winds, rain, and storm surge.

654. In any given year, it is likely that Tonga is either hit by or recovering from, a major natural disaster.²⁹⁸ Estimated annual average disaster damage and losses from cyclones, earthquakes and tsunami are equivalent to 4.4 of GDP. Between 1960 and 2018 (see Figure 30), Tonga has been hit by an average of 12 tropical cyclones each decade. Since 1997, Tonga has experienced approximately 14 natural disasters which have affected a total of 109,000 people and damaged over 1,500 homes.²⁹⁹

Figure 30: Number of Tropical Cyclones affecting Tonga from 1960 – 2018



Source: WTO calculation³⁰⁰

295 Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909 TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

296 Ibid.

297 World Risk Index 2016. Available at: <http://www.irdrinternational.org/2016/03/01/world-risk-index/>.

298 Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909 TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

299 The World Bank (2015) Pacific Catastrophe Risk Assessment and Financing Initiative(PCRAFI). Country Note. Available at <https://www.gfdr.org/sites/default/files/publication/country-note-2015-pcrafi-tonga.pdf>.

300 Ibid.



655. Notable natural disasters that have hit Tonga in the past include, Tropical Cyclone (TC) Isaac in 1982, TC Hina in 1997, TC Waka in 2001, and TC Heta in 2004. TC Isaac and Waka destroyed many homes along with much of the country's agricultural crops, causing T\$134.2 million (US\$75 million) in losses. TC Hina caused total damage of approximately T\$18.2 million (US\$10.2 million) in 1997 values.³⁰¹ Incidents of earthquakes (7.8 magnitude) and subsequent tsunami in 2009 destroyed over half of the houses on Niua Tutapu before continuing to cause further damage on Samoa.
656. The country is expected to incur, on average, T\$28.2 million (US\$ 15.8 million) per event per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Tonga has a 50% chance of experiencing per event loss exceeding T\$319 million (US\$178.2 million), and a 10% chance of experiencing a per event loss exceeding T\$783 million (US\$437.4 million).³⁰²
657. In recent years, two Tropical Cyclones (Ian in January 2014 and Gita in February 2018) have hit Tonga. Cyclone Ian, with sustained winds of more than 124 mph and gusts up to 180 mph, was one of the most powerful storms ever recorded to hit Tonga's Ha'apai Island group, causing significant damage to housing and critical infrastructure.³⁰³ It affected some 5,500 people (almost 70% of the Ha'apai island group inhabitants). The housing sector was particularly affected, with approximately 75% of Ha'apai's housing stock destroyed or severely damaged.³⁰⁴ A post-disaster economic assessment of TC Ian estimated the combined physical damage and economic loss from this event to be T\$90 million (US\$50.3 million), equivalent to 11% of Tonga's gross domestic product (GDP). (Government of Tonga, and FAO, 2014).³⁰⁵
658. Tropical Cyclone (TC) Gita passed over the Tongatapu and 'Eua island groups around 11 pm on Monday February 12, 2018. It was the strongest tropical cyclone to impact Tongatapu and 'Eua since TC Isaac in March 1982, with an average wind speed of 130 kph and gusts of up to 195 kph - just short of a category 5 storm. An accompanying storm surge reached 1m above normal high-tide levels, and 200 mm of rainfall fell over a 24-hour period, resulting in localized flooding.
659. The storm impacted approximately 80,000 people, approximately 80% of Tonga's population. It brought down power lines; damaged and destroyed schools, resulting in closures; destroyed crops and fruit trees; and damaged public buildings, including the domestic airport, the Parliament building, and Tonga meteorological services. TC Gita also significantly impacted housing, with over 800 houses destroyed and a further 4,000 damaged. Damage and losses from TC Gita are estimated at \$164.1 million, equivalent to 37.8% of the country's GDP.³⁰⁶
660. Tonga's economic growth has been adversely affected by the frequent occurrence of natural disasters, and external price shocks.³⁰⁷ Cyclone Gita reduced the GDP growth rate from 2.9% in 2017 to 0.4% in 2018. Economic growth had been predicted to reach 3.4% in 2018. Following the onset of TC Ian in 2014, total trade as a share of GDP decreased by 9 percentage point from 82.9% in 2013 to 74.2% in 2014. Imports as a share of GDP fell by 4 percentage points from 62.6% to 57.4%, while exports dropped by 5 percentage point from 20.4% to 16.8% – with agricultural exports the main casualty.
661. The impact of TC Ian was significant, but less severe than TC Gita, with the focus of damage being the outer chain of the Ha'apai Island group. Nevertheless, TC Ian still contributed to a worsening of Tonga's trade balance and an increase in Tonga's stock of debt equivalent to 43.2% of GDP, external debt accounting for approximately 92% of that amount. In its 2018 assessment of the Tongan economy, the IMF noted that reconstruction costs after Cyclone Ian in 2014, and a legacy of large external loans, have contributed to an accumulation of external debt in Tonga.³⁰⁸
662. Reconstruction and recovery efforts after disasters reduce resources available to other sectors, further tighten already limited government budgets, and expose the economy to higher debt risk. The IMF–World Bank 2017 Debt Sustainability Analysis indicated that reconstruction costs due to disasters had significantly contributed to the accumulation of the country's external debt. Although external debt remains stable in the short term, the debt distress rating increased from moderate to high risk in the medium term.

Impact on Natural Disasters on Trade and the Economy

301 FAO & Government of Tonga (2014). TONGA Cyclone Ian in Ha'apai Rapid Damage Assessment to the Agriculture and Fisheries Sectors Report. Available at <https://reliefweb.int/report/tonga/cyclone-ian-ha-apai-rapid-damage-assessment-agriculture-and-fisheries-sectors-report>.

302 The World Bank (2015) Pacific Catastrophe Risk Assessment and Financing Initiative(PCRAFI). Country Note. Available at <https://www.gfdr.org/sites/default/files/publication/country-note-2015-pcrafi-tonga.pdf>.

303 Singh, A. (2014). Post Tropical Cyclone Ian Rapid Water Resources Assessment. Technical Report 202. Available at: https://www.researchgate.net/publication/287194962_Post_Tropical_Cyclone_Ian_Rapid_Water_Resource_Assessment_Lifuka_Kingdom_of_Tonga.

304 t The World Bank (2015) Pacific Catastrophe Risk Assessment and Financing Initiative(PCRAFI). Country Note. Available at <https://www.gfdr.org/sites/default/files/publication/country-note-2015-pcrafi-tonga.pdf>.

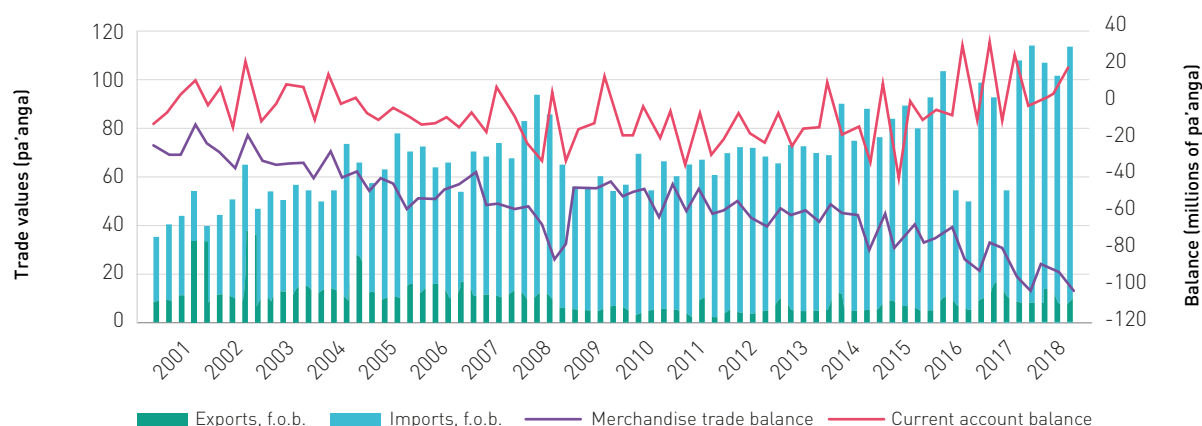
305 FAO & Government of Tonga (2014). TONGA Cyclone Ian in Ha'apai Rapid Damage Assessment to the Agriculture and Fisheries Sectors Report. Available at <https://reliefweb.int/report/tonga/cyclone-ian-ha-apai-rapid-damage-assessment-agriculture-and-fisheries-sectors-report>.

306 "Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909-TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

308 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.



Figure 31: Trends of merchandise trade and balances



Source: WTO computation based on data from National Reserve Bank of Tonga

663. The increase in Tonga's external debt risk rating indicates the fiscal fragility of the economy and the significant impact of disasters on the country's debt sustainability. The government's policy of no non-concessional external debt has helped in controlling the country's outstanding debt. However, to maintain fiscal sustainability, the IMF and World Bank are recommending prudent spending to achieve and maintain a budget surplus equivalent to 1.0% of GDP over the medium term, as well as providing for buffers at a minimum of 4–5 months of the government's recurrent expenditure.³⁰⁹
664. Important to note also is that remittances act as a fiscal buffer, at both household and at a business level for micro, small and medium sized enterprises. In the aftermath of TC Gita in February 2018, remittance receipts from families and relatives abroad recorded growth of T\$4.4 million (18.5%) to reach a monthly high in March of T\$28.0 million.
665. In the wake of Tropical Cyclone Ian, the government of Tonga and the World Bank through the Global Facility for Disaster Risk Reduction, with funding from the Africa Caribbean Pacific-European Union Natural Disaster Risk Reduction Program, worked rapidly to assess damage, and implement a recovery program which would strengthen the housing and transport infrastructure sectors against future natural hazards. A Cyclone Ian Relief Account was established by Ministry of Finance and had received T\$1.5 million (US\$837,000) in contributions by March 20, 2014. The donations came from development partners, communities, businesses, individuals, and the Tongan diaspora, all of whom wished to contribute toward the relief efforts. In addition to the cash donations received from the international community in the month after TC Ian, a further T\$25.7 million (US\$14.4 million) was committed to facilitate the response plan.
666. In the immediate aftermath of TC Gita cyclone, donor contributions and insurance pay outs enabled substantial contributions to the government's Emergency Fund. One example is the approval of supplemental funding totalling US\$10 million by the World Bank's Board of Executive Directors in June 2018 as part of Tonga's Second Inclusive Growth Development Policy Operation.
667. The IMF projects that Tonga's fiscal deficit will widen to 2.3% of GDP in 2018 and reach 4.4% of GDP in 2020 due to increased infrastructure investment. It should stabilize at around 1.4% of GDP, before the effect of any future natural disasters. Table 20 gives information on macroeconomic indicators.
668. The nature of the damages and losses from TC Evan and Gita varied significantly in scale, by island, by district and by business. At a sectoral level though, the two cyclones had comparable impacts, with the sectors that sustained the greatest damage being agriculture and fisheries.

309 "Pacific Economic Monitor", December 2018, Asian Development Bank. Available at: <https://www.adb.org/sites/default/files/publication/471196/pem-december-2018.pdf>.



Table 20: Selected macroeconomic indicators for Tonga

	FY2015	FY2016	FY2017	FY2018	FY2019
Output and prices (percent change)			Est.	Proj.	Proj.
Real GDP	3.7	3.4	2.7	3.4	3
Consumer prices (period average)	0.1	-0.6	7.2	5.3	2.5
Consumer prices (end of period)	0.2	0.2	10.3	2.5	2.5
GDP deflator	1.5	1.7	3.1	2.1	2.1
Total Revenue	34.9	40.9	44.5	53.5	52.6
Revenue (excluding grants in-kind)	28.1	30.6	30.5	32.1	30.3
Grants in-kind	6.8	10.3	14	21.5	22.3
Total Expenditure	37.6	41.3	44.9	55.8	54.5
Exports, f.o.b.	19.4	24.1	25.3	26.4	27
Imports, f.o.b.	-207.7	-202.8	-235.1	-258.4	-281.2
Services (net)	-19.4	-9.1	-14.4	-17.3	-21.7
Investment income (net)	4.5	2.5	6.8	8.7	11.6
Current transfers (net)	137.9	129.7	166	190.5	207.5
Of which: Remittances	102.2	112.2	117.4	124.3	130.4
Of which: Official grants	27	33	53.1	69.6	80.5
Current account balance	-65.3	-55.6	-51.3	-50.1	-56.7
(In percent of GDP)	-15	-13.2	-12	-11.8	-12.9
Overall balance	-16.2	23.9	3.5	15.4	-8.5
Terms of trade (annual percent change)	-3.6	2	3.1	-1.8	-0.5
Gross official foreign reserves (US\$ millions)	142.5	166.4	169.9	185.2	176.7
(In months of imports)	6.3	6.3	5.9	5.9	5.5
Public debt (external and domestic)	51.4	51.8	48	49.2	50.3
External debt	45.2	44	41.8	43.2	44.6
Debt service ratio	1.6	1.6	1.6	1.5	3.8
GDP per capita (T\$ thousands)	8.1	8.5	9	9.5	9.9

Source: IMF 2018³¹⁰

669. The agriculture sector (comprising crops, livestock, fisheries, and forests) accounted for 17% of Tonga's GDP in 2016. About 75% of Tonga's population lives in rural areas, with agriculture and fisheries being the main source of livelihoods. Tonga has one of the highest rates of subsistence food production among Pacific Island Countries, largely based on traditional production of root crops, which provide food security, employment, and income for many households. As such, tropical cyclones have a particularly serious impact on some of the

poorest and most vulnerable Tongans through their effect on small-scale and subsistence farming activities. These events also impact the trade and macroeconomic performance.

670. TC Ian in 2014 caused a total of T\$97.5 million damage and production losses in the agricultural sector. It paralyzed local food supply on Ha'apai island and of key cash crops for some six to ten months. Damages to tree crops (coconuts, breadfruit, mangoes, citrus), and key cash crops

310 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

(mulberry, sandalwood) and pandanus were as high as 90%.

671. TC Gita in 2018 caused an estimated T\$129.3 million damages to the agricultural sector. Production losses caused by TC Gita translated into significant drops in exports. Major crops exports fell by 1,686 tonnes (37.4%) due to a fall in major exported crops such as root crops, plantain and coconuts. The export of cassava dropped by 1,590 tonnes (53.0%), giant taro (kape) declined by 49.0 tonnes (48.2%), and plantain and coconuts decreased by 37.0 tonnes (69.1%) and 11.0 tonnes (13.9%) respectively. These outweighed a rise in the exported volume of yam, taro and breadfruit. TC Gita also caused disruptions to the schedule of shipping vessels and other facilities necessary for exporting.
672. Both cyclones also affected the fisheries sector. TC Ian caused damage to the fisheries sector on Ha'apai island of T\$1.14 million, affecting a total of 206 fishing households in the affected area. Damage sustained to fishing boats, outboard motors and, more severely, to an estimated 100% of all fishing gear, including nets, diving equipment, lines and other equipment Ha'apai island. TC Gita also damaged fisheries assets, both artisanal and also to commercial snapper boats.
673. In the forestry subsector, the timber industry was impacted by high winds from TC Ian that damaged infrastructure and trees. Commercially high-value trees such as mulberry and pandanus trees accounting for a substantial portion (89%) of damage during TC Gita, while timber trees (pine, mahogany) accounted for the remainder.
674. TC Ian disrupted economic activity on Ha'apai island as many shops were either damaged or shut down leading to limited supplies. Transportation of goods to functioning shops in Haapai was constrained and expensive. It severely impacted business activity, pushing businesses to rely more on their savings and donations from outside, including remittance flows. TC Gita inflicted similar damage but on a wider scale. A survey conducted among a sample of businesses in the affected communities of Tongatapu and 'Eua, estimated that approximately 60% had reported partial damage to their properties, with a further 3% of businesses destroyed. Total damages to assets was estimated at \$55.27 million.
675. Both TC Ian and Gita affected tourism with damage to resorts, cancelled bookings and a severe business down-turn. The cyclones contributed to a short-term reduction in employment opportunities and subsequent impact on the local economy (Government of Tonga, and FAO, 2014). TC Gita caused estimated damage of T\$40.6 million to

the tourism sector, mainly in the form of damages to accommodation (90% of the total damages). Around 72 of the 76 accommodation businesses on Tongatapu and 'Eua sustained damage, with the resort category (14 properties) most affected. Of the T\$12.1 million in damages, an estimated T\$9.5 million was uninsured.

676. The impact of TC Gita on the power sector was estimated at T\$17.14 million, consisting of T\$13.41 million in damage to infrastructure and T\$3.7 million in losses to Tonga Power Limited (TPL) mainly from loss of revenue. This disrupted power supply on the islands of 'Eua and Tongatapu, affecting all Tonga Power Limited (TPL) customers in the area. All customers on 'Eua (approximately 1,170) were disconnected from the electricity supply for 14 days before power was restored. On Tongatapu, approximately 17,782 customers who were disconnected from the electricity supply. Like the power sector, Tonga's transport infrastructure and networks across the three subsectors (land, maritime, and aviation) also suffered minor damage.
677. The IMF projects that over the next three to four years, losses from Cyclone Gita will be partially offset by reconstruction and repair activity for housing, public buildings, and schools, which is began in the 2017/18 and expected to ramp up over the next two years before scaling back in 2020/21.

Policy Issues

678. In preparation of the arrival of TC Gita, a state of emergency was declared for the whole of Tonga by the Acting Prime Minister. The state of emergency initially covered the period Monday, 12 February until Monday, 12 March 2018. It was subsequently further extended to 9 April. Responsibility for coordinating the response to the cyclone fell to the National Emergency Management Organization (NEMO). Response was organized around a series of nine clusters, each with a lead national agency and supported by UN organizations and other agencies.³¹¹ Overall coordination and logistics were managed by the Director of NEMO.
679. Within the essential services cluster, power was reported as restored to 76% of customers on the main island of Tongatapu only by 8 March. Tonga Power Ltd worked with AusAid to restore operation. Generators supplied by Ausaid restored power in outer island communities, including to village health clinics. Without power, many businesses were unable to recommence operations, and cold chain operations (for medicines and foodstuff) were compromised.
680. In the logistics cluster, NEMO organized distribution of relief containers received from overseas into

311 The nine clusters covered: Coordination and logistics; emergency shelter and non-food items; essential services; Health, Nutrition, Waster, Sanitation and Hygiene; Safety and Protection; Food Security and Livelihood; Communications; Education; Repair/Rebuilding of Houses; Restoring the Economic and Social Environment.



three categories: family to family, organizations/church to organization/church and containers addressed to no one in particular. In addition to containers, a large number of parcels were sent by air freight by members of the Tongan diaspora to their relatives and friends back home. The New Zealand-Tonga Business Council was a key actor, mobilizing donations of relief supplies. Another important actor was the Church, with many faith-based groups sending and distributing relief supplies. The transport, customs clearance and distributions of relief was facilitated by the lack of major damage to airport and port infrastructure, and rapid clearance of storm debris by the Tongan army.

681. To support response and recovery, the Government of Tonga approved a six-month waiver on all duties and taxes on foodstuffs and clothing sent by Tongans abroad and destined for household consumption. The exemption of these items ended on 30 August 2018, and the government made press announcements in advance of this deadline to alert the end of the exemption. Hundreds of containers filled with donated goods were sent

to the Kingdom from New Zealand – with most of the containers provided free of charge by the business community.³¹² No quantitative restrictions on exemptions were applied to households. A further exemption on tax and import duties is being applied by the Government of Tonga on building materials will continue. The exemption is due to expire in February 2020. The exemption applied both to households and businesses, again without quantitative restrictions applied.

682. The Trade Policy Review of Tonga conducted in 2014 noted that in terms of revenue forgone, customs duty and tax exemptions play a significant role. The Review found that Tonga's customs tariff stipulates exemptions for certain uses or users that amounted to (T\$91.2 million in 2012/13), equivalent to about 40% of government expenditures. The exemptions include fuel subsidies (concessions) for electricity generation and transport, for manufacturers of beer and other alcoholic beverages, for the fisheries sector, electricity generation, air transport, domestic shipping. Box 36 below outlines the sector-specific exemptions outlined in the 2014 TPR in more detail.³¹³

Box 36: Sector-specific tariff exemptions

- **Agricultural Sector:** Duty and Consumption tax free goods include agricultural tools, live animals, stock feed, packaging materials, timber milling equipment, insecticides, pesticides, fungicides, agricultural equipment and implements including hand tools, seeds, fertilizer, packaging materials. Special exemptions are available after a national emergency.
- **Construction sector:** Basic building materials are duty free: timber, roofing iron, cement, guttering, plumbing pipes (PVC); capital items are 3% duty; payment by instalment allowed. Special exemptions after a national emergency are also available. For instance, tax on building materials were removed for two years after Cyclone Gita ravaged Tonga.
- **Education and medical:** Medicines, medical equipment, educational materials (imported by educational institutions), charitable donations, project materials (funded by Donor Partners), payment by instalment allowed, sale of leases for residential purposes are exempt from consumption tax if sold by a business registered for CT.
- **Fisheries sector:** Various items are designated duty and consumption tax free. These include fishing inputs, fuel, fishing vessels; navigation and sea safety equipment; outboard and inboard engines and spare parts; fishing gear; fishing bait; fish; aggregating Devices; vessel monitoring systems; hydraulic drop-line fishing reel; pearl oyster farm equipment and materials; aquaculture farm equipment and materials and fish fence wire. Special exemptions are available after a national emergency.
- **Manufacturing sector:** A range of items are designated duty free. These include compound alcoholic preparations, bottles, malt, yeast and sugar imported for beer manufacture, egg trays, packaging, bottles, bottle caps, resins, dyes, pigments, benzoic acids etc for paint making, sugar, powdered milk for ice-cream, carbonates, materials for the manufacture of roofing iron, capital items are 3% & basic building materials are duty free, payment by instalment allowed with conditions. Special exemptions after a national emergency are also available.
- **Tourism sector:** Various items have been listed as duty exempt and reduced for the tourism sector. These include basic building materials: timber, roofing iron, cement, guttering, plumbing pipes (PVC). Capital items are 3% duty listed.
- **Transport sector** – life saving equipment, equipment for use within confines of airport, communication and signal equipment, and basic building materials are duty free, with capital items listed at 3%. Special exemptions after a national emergency are also available.

Source: WTO, Trade Policy Review, Tonga³¹⁴

312 "Gov't reminds Tongans overseas to take advantage of Gita tax-free before August 30", Kanivatonga News, 27 July 2018. Available at: <https://kanivatonga.nz/2018/07/govt-reminds-tongan-overseas-to-take-advantage-of-gita-tax-free-before-august-30/>.

313 "Tonga: Trade Policy Review, Review by the Secretariat", 27 February 2014, WT/TPR/S/291/Rev.1 Available at: https://www.wto.org/english/tratop_e/tp_r_e/tp_r_e.htm.

314 Ibid.



683. Issues with unsolicited bilateral donations were not reported by NEMO or donors. Learning the lessons from the response to Cyclone Pam in Vanuatu, the Government of New Zealand, and non-governmental organizations recommended cash gifts, rather than donation of goods.³¹⁵ Where goods were sent, they were in response to a request for those goods from an actor in the affected Tongan population (e.g. a family member, church group or business). Social media platforms played a key role in ensuring that the supply of relief materials mapped need in the aftermath of Cyclone Gita.³¹⁶
684. The continued operation of telecommunications links in many places and the rapid re-establishment of the network in places where it was damaged helped the relief and recovery effort. Those affected were able to communicate their needs, including to the Tongan diaspora. Telecom companies were also actively engaged in the relief effort. Digicel flew a Boeing 737 filled with humanitarian relief from Fiji shortly after the passage of TC Gita and also loaded relief supplies onto a French navy ship. In addition to the distribution of aid, the company loaded \$10 of free credit onto customers phones in advance and immediately after the passage of the cyclone.
685. In advance of the arrival of TC Gita, Digicel engineers removed equipment from phone towers and generally readied the network for the storm. The preparations meant that the connectivity was not lost, even though the Digicel office in Nuku'alofa was severely damaged. Building work to refurbish the company's commercial premises was completed at the end of May 2018.
686. Among the issues highlighted by the company was access to power to charge phones and bank liquidity problems. In the three weeks it took to restore power to Tongatapu, some customers experienced problems in charging their phones. Digicel offers a mobile money service to remit money where credit can be converted to cash. With ATMs out of action and banks struggling with liquidity, the company encountered some issues in converting credit to cash – not least since the volume of remittances more than doubled after the storm. Digicel Tonga Ltd was helped in their response and recovery by a Digicel Group-wide emergency operations' manual.
687. Tonga is taking steps to implement the WTO's Trade Facilitation Agreement (TFA). In April 2017, Tonga notified to the WTO its TFA commitments in Categories A, B, and C with indicative dates for implementation. Five months later, Tonga notified to the WTO implementation dates for its category B commitments. WTO analysis suggests that 17.6% of TFA measures will come into legal force on Tonga's ratification of the TFA. Some 56% of commitments require additional time to be implemented. Some 26.5% of commitments were placed in category C (i.e. requiring capacity building support to undertake). Indicative implementation dates stretch to 2020 for category B commitments and 2022 for category C commitments.
688. To support implementation of the TFA, Tonga has requested capacity building for TFA measures including: making information available through the internet, comments and information before entry into force, advance rulings, test procedures, risk management, post-clearance audit, average release times, authorized operators, border agency cooperation, formalities, acceptance of copies, use of international standards and single window.³¹⁷ At the time of writing, Tonga had not deposited its instrument of acceptance of the TFA.
689. Recovery from Tropical Cyclone Gita exposed pre-existing structural constraints in the Tongan economy. In the view of the IMF, these constraints include shortcomings in the business climate, and the need to expand market access for exports and increase the value added of domestic production through building manufacturing and packaging capacity in Tonga. A policy recommendation made by the IMF is structural reform to attract investments and to increase private sector participation in public enterprises.³¹⁸
690. Limited business opportunities and difficulty in accessing credit constrain private sector development, particularly for micro, small, and medium enterprises (MSMEs).³¹⁹ Access to credit was a notable constraint in the post-cyclone period, with the private sector requesting access to credit at soft interest rates to support recovery.³²⁰
691. The national authorities are developing Tonga's National Trade Framework strategy for enhancing export-oriented production and an MSME development strategy. The government's Tonga Strategic Development Framework addresses some of these structural issues, particularly as regards development of resilient infrastructure, enhancing health and education to build human capital, and promoting the diversification of domestic production, notably in agriculture, manufacturing, and tourism.³²¹

315 Interview with New Zealand High Commission in Nuku'alofa, 28 May 2018.

316 Interview with Pacific Trade and Invest, Auckland, 1 June 2018.

317 WTO Trade Facilitation Agreement Database <https://www.tfadatabase.org/uploads/notification/NTON1A1.pdf>.

318 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

319 Ibid.

320 Situation Report 12, Tropical Cyclone Gita, 12 March 2018, National Emergency Management Office.

321 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.



692. Tropical Cyclone Gita in 2018, was a significant set-back for the agriculture sector. Significant destruction to standing perennial crops such as bananas, cassava, coconuts etc was due to Cyclone Gita. This led to the major decline in agricultural exports. The storm caused an estimated T\$129.3 million damages to the agricultural sector. Tonga's agricultural and horticultural export performance had rebounded since 2011. Seasonality strongly favours Tonga in accessing the New Zealand market. Tongan production of horticultural products tends to be higher, and prices lower, between June and October. This coincides with the period when supplies of many items in New Zealand are scarce or non-existent, and when prices in Australia (a competing exporter) are the highest. There are good air and sea freight linkages between Tonga and Auckland, although costs, particularly for air freight, tend to be high due to low volumes. Current exports are almost entirely confined to low value products transported by sea, such as root crops, pumpkins, squash, watermelons and coconuts. Exports of fresh fruit and vegetables are negligible, and there are no export protocols in place for a number of potentially profitable export commodities.³²²
693. Progress in negotiating new or improved access has been slow, resulting in a high level of frustration and missed export opportunities. New market access agreements have been few and hard won, and trade in some products has stagnated or declined due to the imposition of more onerous protocols for products that were historically traded with relative ease. These conditions apply to some extent to most agricultural and horticultural commodities, with approved market access pathways for some items (albeit with strict compliance protocols), but total import prohibition for others.³²³
694. One constraint identified by PHAMA is the limited capacity to support the expansion of the export sector in terms of export inspection and certification. This is exacerbated by the demands on Ministry of Agriculture, Forests and Food (MAFFF) to inspect and certify large numbers of small consignments of handicraft products (mats, wood carvings, tapa etc.) MAFFF also has limited capacity to provide the necessary research and extension support including grower registration and quality assurance schemes, maintain required biosecurity standards such as pest and disease surveillance, and to progress market access issues and negotiate export/import protocols. Other factors which need to be considered include the high cost of agricultural inputs (seeds, fertilisers, agro-chemicals etc.), the high cost of fuels and energy, limited access to finance and inadequate infrastructure of the packhouses which are required to be Hazard Analysis Critical Control (HACCP) certified, an issue in view of MAFFF.
695. Tropical Cyclone Gita caused significant damage to a critical component of the agricultural export value chain i.e. post-harvest facilities for fumigation, grading, and packing into reefer containers (chilled and frozen) prior to export. Establishment of the MAFFF post-harvest facility at Nuku'alofa and a modern private sector HACCP accredited packhouse, operated by Nishi Trading Co Ltd, were major advances for efforts at agricultural diversification.
696. The MAFFF facility was established with EU STABEX funding in 2010 and is equipped for washing, peeling, cutting, bagging, chilling and freezing produce with a capacity of around 4-5 tonnes per day. It also includes a methyl bromide fumigation chamber with a capacity of around 20 tonnes per day. The facility operated by Nishi Trading was Tonga's first international standard export packhouse and food processing plant, and partly financed by a grant from the EU-funded Increasing Agricultural Commodity Trade programme. The packhouse is used to process Nishi's own produce for export and is available on a fee-for-service basis for other growers and exporters.³²⁴ Box 37 below highlights support from the regional business community to re-establish operations.

322 "Infrastructure requirements for horticultural exports from Tonga", 15 January 2018, David Young and Carol Nelson, Pacific Horticultural and Agricultural Market Access (PHAMA) Program. Available at: <http://phama.com.au/wp-content/uploads/2018/01/TR116-Infrastructure-requirements-for-horticultural-exports-from-Tonga.pdf>.

323 Ibid.

324 Idem.



Box 37: Rebuilding agricultural export capacity in the wake of Tropical Cyclone Gita

Following natural disasters, aid and rebuilding initiatives are usually directed at communities and families. It is relatively rare though for affected businesses in disaster-struck regions, particularly in the Pacific Islands, to receive overseas assistance to rebuild damaged business infrastructure. A group of private sector companies, led by the Auckland chapter of the University of Otago Alumni Association, came together to do exactly that – rebuild a major Tongan exporter's infrastructure devastated by Cyclone Gita. The group decided to direct the rebuilding effort primarily at affected Tongan businesses. Nishi Trading, one of Tonga's leading exporters was identified. Situated on the main island of Tongatapu, the company's farm suffered massive damage, where some 300 acres of plantation was affected in addition to severely damaged buildings housing its packhouses and other infrastructure. Getting Nishi on track will have multiple positive effects for revitalising the economy. To support the effort, Australasia building industry major Fletcher Group committed to provide steel coils, which Metalcraft, New Zealand's leading roofing iron manufacturer pressed the steel into roofing products. Matson Shipping provided discounted freight.

Source: Pacific Periscope³²⁵

697. In the view of the IMF, to broaden export markets, strategies should tackle the inclusion of relevant international standards to ensure that products can be exported to partner countries.³²⁶ The PHAMA programme identified fruit fly quarantine and research as vital for Tonga's exports of fresh fruit and vegetables, such as papaya and chilli. However, the plant quarantine facility at the airport (high temperature forced air treatment facility) still needs to be certified by New Zealand. Tonga has a bilateral quarantine arrangement with New Zealand. The fumigation facility is run by the MAFFF.³²⁷
698. A concern highlighted during the national WTO workshop on the SPS and TBT agreements held in May 2018 was difficulty in disposing of waste forest products due to the presence of quarantine plant pests. Hurricane Gita downed many commercially valuable trees, but these were either left where they had fallen or were used in the domestic building industry. To get around this difficulty, the Pacific Horticultural and Agricultural Market Access Program (PHAMA) imported mobile sawing machines so that the timber could be used in the domestic building industry.
699. Another sector that has been impacted by the successive tropical cyclones, but that has demonstrated considerable resilience and growth is the tourism sector. Figure 32 below shows the growth of tourism receipts over the period of 2006–2018 – with the impact of Hurricane Ian in 2014 on tourism receipts evident in the time series. Visitor exports generated T\$110.2mn (USD48.4mn), 63.4% of total exports in 2017.³²⁸ World Travel and Tourism Council (WTTC) research suggests that visitor exports may fall in 2018 by 22.8%, due to the impact of TC Gita. Tourist arrivals are predicted by WTTC to grow from 47,000 to 87,000 per year by 2028, with tourism's share in national investment rising from 15.6% to 21.5% over the same period.
700. Tourist arrivals fall into two distinct categories: those arriving by air and those arriving by sea (on cruise ships or private yachts). Arrivals by air to Tonga have grown 44% over the past 10 years, to and reached a peak of 62,500 in 2017. While the number of overnight visitor arrivals is modest compared to neighbouring Pacific Island destinations, the rate of growth is comparable. The growth of cruise ship visits has also contributed to the expansion of Tonga's tourism sector. In 2017 there were 19 cruise ships carrying almost 22,000 passengers visiting ports in Tonga, more than double the cruise passenger numbers seen in 2013. Approximately 25% of these passengers disembark from ships, spending around T\$200 each on tours, restaurants, and shopping. Finally, the smaller but reportedly higher-spending private yachting market generates around 2,000 arrivals annually.³²⁹
701. The South Pacific Tourism Organization is exploring the Chinese outbound market as a potential growth market. China's market share of Pacific tourism has more than doubled since 2013 to reach 7% of arrivals in 2017. Further growth is expected, including as a result of the China Pacific Tourism Year initiative.³³⁰ Diversification in tourism to new outbound markets can play an important role in disaster recovery and future resilience.

325 "NZ firms join hands to rebuild cyclone ravaged Tongan business", 22 May 2018, Available at: <https://pacificperiscope.wordpress.com/2018/05/22/nz-firms-join-hands-to-rebuild-cyclone-ravaged-tongan-business/>.

326 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

327 "Tonga: Trade Policy Review, Review by the Secretariat", 27 February 2014, WT/TPR/S/291/Rev.1 Available at: https://www.wto.org/english/tratop_e/tpr_e/tpr_e.htm.

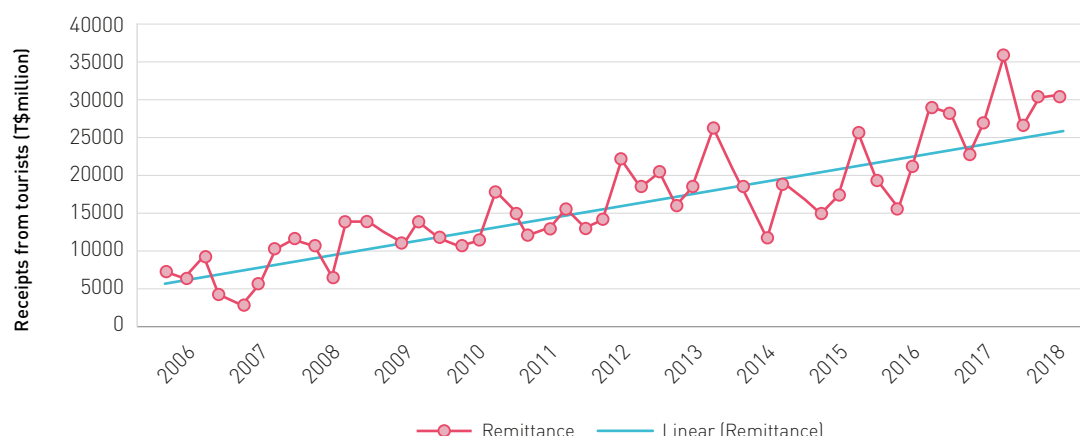
328 "Tonga: Economic Impact of Tourism 2018", World Travel and Tourism Council, Available at: <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/tonga2018.pdf>.

329 "Post Disaster Rapid Assessment Tropical Cyclone Gita", Government of Tonga (2018). Available at https://www.gfdrr.org/sites/default/files/publication/WB_Tonga_Report_FA02_Medium_0.pdf.

330 "SPTO eyes China market to offset decline from traditional markets", 7 February 2019, South Pacific Tourism Organization website. Available at: <https://sustainability.southpacificislands.travel/spto-eyes-china-market-to-offset-decline-from-traditional-markets/>.



Figure 32: Growth of tourism in Tonga – 2006-2018



Source: WTO computation based on data from National Reserve Bank of Tonga

702. One factor mentioned by Pacific Trade and Invest as a constraint for reconstruction activity in the tourist sector is insurance coverage and speed of settlement of claims. A background note by the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) highlights that the non-life (general) insurance market in Tonga is small, not only in absolute terms, but also relative to the size of the country's population and economy. In 2015, total non-life insurance premium was T\$7.6 million (US\$4.3 million). This equates to premium per capita of around T\$75.2 (US\$42), which is lower than rates in other PICs. It is estimated that around 15% of the insurance business in Tonga is placed offshore by international insurance brokers.³³¹

703. The PCRAFI briefing note stated that in 2015 Tonga had no legislation in place to regulate its insurance industry. In the absence of a regulator, the solvency of domestic insurers, and hence their ability to pay claims and withstand shocks such as natural disasters, are not assessed by any government agency. It is not possible to confirm that insurers have adequate financial security to meet any catastrophe exposures. The absence of a regulator also has implications for consumer protection, as no government agency is ensuring the appropriateness of insurance products sold in the market. In its WTO accession package Tonga excluded limitations to market access and national treatment for the non-life insurance market – except for horizontal limitations.

704. As part of its WTO accession package, Tonga scheduled GATS commitments for life insurance services, non-life insurance services and reinsurance. Commitments in the insurance sector do not include any limitations on market access or national treatment for modes 1 (cross-

border supply), 2 (consumption abroad) and 3 (commercial presence). Tonga left mode 4 unbound for insurance "except as indicated under horizontal commitments". Under the horizontal commitments, several limitations apply. Government approval is required for foreign investment and foreigners can only attain land through leasing (for up to 99 years with the right to sub-lease). Under mode 4, market access is limited to the entry and temporary stay of services salespersons (for up to 90 days). Market access for intra-corporate transferees is limited to managers, executives, specialists and personnel engaged in establishment, and several conditions need to be met in each category for entry. Under national treatment, it is noted in mode 4 that subsidies available to natural persons may be limited to Tongan citizens.

705. Catastrophe risk insurance presents a challenge to insurers' exposure management, according to PCRAFI, because unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their portfolio to ensure that they can withstand large disaster shocks without threatening their solvency. The capacity of the domestic market in Tonga is constrained by the small number of participants and the limited premium volume. Although some risk is placed offshore, the high cyclone risk has proved a deterrent to market expansion in the past. Insurers in the Pacific region using the international reinsurance markets have been adversely impacted by significant increases in reinsurance costs in recent years.

331 Pacific Catastrophe Risk Assessment and Financing Initiative, County Note, Tonga February 2015. Available at: <http://pcrafi.spc.int/documents/108>.

Box 38: Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)

Since 2016, the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) has provided Pacific Island governments with insurance against tropical cyclones, earthquakes and tsunamis. Vanuatu, Tonga, the Marshall Islands, Samoa and the Cook Islands were the first policyholders to join PCRAFI in 2016. PCRAFI aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modelled representation of the event based on hazard parameters and a calculation of total modelled physical damage. Unlike a conventional insurance scheme, where a pay-out would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster pay-out. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. PCRAFI made a payment of US\$1.27 million towards recovery from Cyclone Ian and a further payment of US\$3.5 million in the wake of Cyclone Gita.

Source: World Bank³³², PCRAFI³³³

706. Building on experience in the Caribbean, the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) was created in 2016 as a sovereign insurance solution for Pacific governments to address the challenges of financing recovery and resilience. Box 38 provides further details on the operation of PCRAFI.
707. An important feature of the government's infrastructure strategy is the mainstreaming of natural disasters resilience and climate proofing by increasing the standards of newly built buildings, roads, and the electricity grid. Tonga has developed a National Infrastructure Investment Plan FY2013-23 with the support of the Pacific Infrastructure Advisory Centre. One of the plan's four themes is sustainability, safety, and resilience. The plan focuses on economic infrastructure facilities such as energy supply systems (electricity, fuel); telecommunications (telephone, internet, and broadcasting); water and waste management (water supply, waste water, drainage, and solid waste); and transportation (airports, roads, and sea ports).
708. Development partners' support plays a critical role in Tongan infrastructure development.³³⁴ External sources of infrastructure financing include grants from development partners, concessional loans from international financial institutions, self-financing by public enterprises, and limited financing by government from consolidated revenues.
709. Currently most economic infrastructure, except roads and outer island ports in Tonga are managed and operated by public enterprises whose financial performance improved in recent years with respect to (i) recording profits, (ii) more paying dividends to the government, and (iii) more strong capacity to self-fund infrastructure maintenance and renewal and fund some of the capital investment projects. Box 39 highlights the public policy choices associated with enforcement of building codes and retrofitting of buildings.
710. Infrastructural development contains a large trade element. Tonga is highly dependent on capital imports related to construction.³³⁵ Tonga is not a member of the Government Procurement Agreement. In its 2017 review, the IMF noted that improving compliance with procurement regulations that support competitive and value-for-money public sector tendering is a key priority for the Tongan Government. Inefficiencies in the procurement process could otherwise increase the cost and related import bill following a natural disaster. Steps already taken include the launch of a Procurement Reform Action Plan, the establishment of a new Central Procurement Unit in Ministry of Finance and National Planning, new Treasury instructions on procurement, and procurement regulations. The CPU is now fully operational and is overseeing all major public procurements, whilst also providing capacity building for procurement officers in line ministries.³³⁶

332 "Tonga to Receive US\$1.27 Million Payout for Cyclone Response", 23 January 2014, World Bank Available at: <http://www.worldbank.org/en/news/press-release/2014/01/23/tonga-to-receive-payout-for-cyclone-response>.

333 "Tonga Receives Record Insurance Payout Following Cyclone Gita", 20 February 2018, Pacific Catastrophe Risk Insurance Company. Available at: <https://reliefweb.int/sites/reliefweb.int/files/resources/TC%20Gita%20PCRIC%20Final%20Press%20Release%2020feb.pdf>.

334 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

335 "Tonga : 2017 Article IV Consultation-Press Release; and the Staff Report for Tonga", 17 January 2018, Country Report No. 18/12, International Monetary Fund, Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/01/17/Tonga-2017-Article-IV-Consultation-Press-Release-and-the-Staff-Report-for-Tonga-45566>.

336 "Tonga – Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909-TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.



Box 39: Building standards and infrastructure investment

The housing sector suffered severe damage and losses from Tropical Cyclone Gita. The storm left 808 private houses destroyed and 3,985 damaged. The education sector was equally affected with school facilities (such as classrooms, staff houses, dormitories) water and sanitation facilities, and associated school furniture, books, and other resources severely damaged. In all, 30 classrooms were damaged beyond repair, 85 had major damage, and 120 had minor damage.³³⁷

In the opinion of the World Bank, ensuring that new buildings can withstand at least one-in-fifty (50) year cyclone wind speeds should be a high priority for policy makers in the Pacific. The changes required to ensure that structures are more robust to cyclones will usually involve small additional costs and modest adjustments to designs when buildings are constructed. The successful implementation of higher building standards will, however, require actions to improve compliance with the new code, including investment in training of engineers and contractors, strengthening of the design and construction permitting process, and provision of enforcement resources.

For existing buildings, cyclone wind retrofitting options can decrease expected losses by 35-50%. Such investments are not always justified, however, when the costs of heavy retrofitting to meet higher standards are greater relative to the benefits in terms of loss reduction. Governments need to prioritize the buildings for which retrofitting would be appropriate to ensure cost-efficiency. For instance, light retrofitting will be more cost-efficient in countries that face higher cyclone risks—notably Vanuatu, Fiji, the Marshall Islands, Tonga and Samoa—where retrofitting public buildings (for example, schools and hospitals) appears to be economically justified.

The heavy retrofitting of public buildings becomes a viable policy option when factoring in their role as evacuation shelters during cyclones. Benefits, including avoidance of potential loss of life or injuries and the loss of the services provided by buildings, should be considered in future analyses. For housing stock, retrofitting is shown to be too expensive in many countries and, therefore, early replacement of the buildings in combination with upgraded construction standards may be a better strategy.

Reconstruction efforts should seek to ensure that buildings—especially public buildings—should incorporate the code improvements necessary to ensure greater resilience to the current and future distribution of cyclone risks. The benefits of greater wind resistance will increase because of climate change over the life of the buildings.

Source: World Bank³³⁸

711. World Bank research suggests that the highest adaptation costs for PICs by 2040 will be coastal protection. To protect PICs from coastal erosion, sea and river flooding, and submergence, three “hard” options are recommended: (i) beach nourishment (particularly in areas with high tourism revenue); (ii) sea and river dike construction; and (iii) port upgrades.
712. In the opinion of the World Bank, there is little prospect that the high costs of building sea walls could be financed by the countries themselves. To manage the uncertainties around future climate change and shoreline behaviour, flexibility should be incorporated into the design of coastal protection interventions. In some situations, hard structural options could be combined with softer non-structural options (for example, ecosystem-based approaches, beach nourishment) to reduce the cost and mitigate the environmental and social impacts. In all cases, strengthening institutional capacity for integrated coastal management is an essential element of responding to climate change.
713. Many climate scenarios suggest that total annual precipitation will increase in most PICs because of climate change. This increase will be accompanied by greater variation in rainfall between wet and dry months, with more intense rainfall in the wettest periods of the year. Adaptation to climate change should, therefore, involve measures to: (i) increase the capacity to store water that is accumulated in wetter months for use in the drier months; and (ii) manage the run-off caused by more intense periods of rain. Investment in increased water storage and rainwater harvesting, especially on islands with limited amounts of land suitable for reservoirs, will be critical. Water tanks will play a key role here and are mostly imported.
714. One option for adapting to climate change would be to increase the existing design standards for flood defences, drainage infrastructure and buildings to a higher standard of protection. A “one size fits all” approach to flood risk and drought management will not be appropriate for PICs. Even if coastal protection is provided to protect infrastructure from sea-level rise and storm surges, additional expenses will be required to protect power and telecommunication, water and sewers, urban areas,

337 “Pacific Possible: Long-term Economic Opportunities and Challenges for Pacific Island Countries”, 2017, Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/168951503668157320/pdf/ACS22308-PUBLIC-P154324-ADD-SERIES-PPFullReportFINALscreen.pdf>.

338 Ibid.



roads and other transport, hospitals, schools and housing infrastructure from changes in rainfall and temperature. The materials and designs used in building infrastructure, as well as the frequency of maintenance, would need to be altered to maintain the same quality of infrastructure services as in the absence of climate change.

715. Tonga is also investing close to US\$40 million in building resilience through improvement of multi-hazard early warning Systems including: ADB Climate Resilience Sector Project (CRSP) Project with a budget of US\$2 million for upgrade of Weather and Coastal Ocean monitoring Equipment; Pacific Resilience Project with a budget of US\$11 million for Upgrade of Multi-hazard Early Warning System and Japan Grant Aid -with a budget of US\$25.5 million for the Nation Wide Early Warning System.
716. In a highly trade-dependent country with limited skills and capacity, many of the architecture, environment and planning services needed to ensure appropriate adaptation solutions will need to be procured by government from overseas, including from other PICs.³³⁹
717. The need for such specialist services was underscored by the discovery of the presence of asbestos in building materials exposed by TC Gita. Older, weathered buildings and unmanaged waste stockpiles are a potential health risk to island communities and relief personnel. In response, the government needed to recruit a certified asbestos specialist to supervise the removal, replacement and disposal of asbestos containing materials.³⁴⁰

VANUATU

Basic Facts

718. Vanuatu is an island nation located in the South Pacific Ocean. Port Vila, on the island of Efate, is the capital. The archipelago is composed of about 82 islands of volcanic origin of which 65 are inhabited and 14 have surface areas of more than 100 square kilometres. Most of the islands are mountainous and of volcanic origin, and have a tropical or sub-tropical climate. Total land surface is about 4,700 square kilometres.
719. Vanuatu's population is approximately 270,000. With 106 languages spoken, Vanuatu is home to the highest linguistic density in the world. Most of the population lives in rural areas where subsistence farming, fishing and production of cash crops such as kava, coconut and cocoa are the main sources of livelihood. However, population growth, of some

2.3% annually, and a rapid urbanization rate are exercising increasing pressure on land and other natural resources.

720. Vanuatu has been ranked by the United Nations University the world's most disaster-prone country.³⁴¹ It is faced with various specific challenges including: high cost of public service provision due to its geographical location and dispersed islands; a narrow economic base; and a vulnerability to external economic shocks, notably those emanating from natural hazards. Vanuatu is susceptible to a variety of both hydro-meteorological and geophysical hazards due to its location in the South Pacific tropical cyclone basin and the Pacific Ring of Fire.³⁴²
721. Climate and disaster resilience are one of five environmental priorities in the 15 point "Vanuatu 2030: The People's Plan", the National Sustainable Development Plan for the period 2016 to 2030. Specifically, on disaster resilience, the plan states that: "We will marshal support to enhance our resilience and adaptive capacity to the impacts of natural and man-made disasters, including increasingly more intense, more frequent, and more prolonged extreme weather events. We will also continue to draw on our rich history of resilience and risk reduction that stems from our traditional knowledge and practices, particularly in relation to food production and preservation."
722. Vanuatu's economy is driven by the services sector, notably the tourism industry, followed by agriculture, fishing and the industrial sectors. Tourism is the main generator of foreign exchange, benefiting mostly from visitors from Australia and New Zealand. In 2016, estimated GDP per capita was about US\$2,900.
723. Vanuatu's ratio of total trade (exports plus imports of goods and services) to GDP increased by 28 percentage points from 78.4% in 2000 to 106.4% in 2016 (see Figure 33). Within the sixteen-year period, import as a share of GDP remained higher than export as a share of GDP. While export as a share of GDP increased by 12.8 percentage point, import as a share of GDP increased by 15.2 percentage point. This imbalance was worsened by the onset of TC Pam in 2015 where export as a share of GDP plummeted while import surged.

339 "Tonga - Second Inclusive Growth Development Policy Operation," April 27, 2017, World Bank Report No. 113909 TO, Available at: <http://documents.worldbank.org/curated/en/603771493517689484/pdf/Tonga-Second-Inclusive-Growth-DPO-PD-04062017.pdf>.

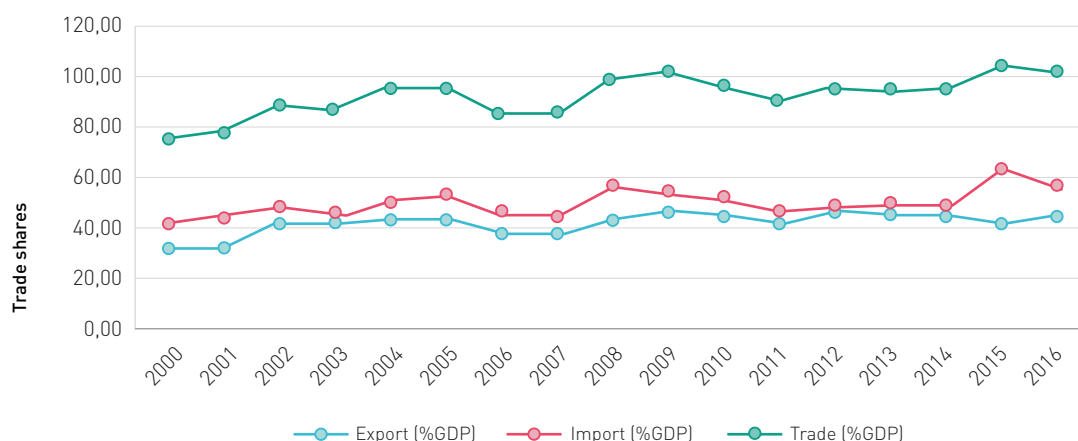
340 Situation Report 12, Tropical Cyclone Gita, 12 March 2018, National Emergency Management Office.

341 "WorldRiskReport 2016", United Nations University. Available at: http://collections.unu.edu/eserv/UNU:5763/WorldRiskReport2016_small_meta.pdf.

342 "Vanuatu - Country Note", February 2015, Pacific Catastrophe Risk Assessment and Financing Initiative, World Bank Group Available at: <http://pcrafi.spc.int/documents/183>.



Figure 33: Trade to GDP ratio for Vanuatu



Source: WTO computation based on data from the Asian Development Bank

724. In 2010, the last year for which figures are available, 10.7% of the population lived below the national poverty line. Life expectancy is about 72 years while adult literacy rate is some 85%. In UNDP's 2016 Human Development Index, Vanuatu ranked 134th of 188 countries and territories. The labour market is characterized by a high degree of informality.

725. Vanuatu is a least developed country; graduation from LDC status is expected in 2020. The UN Committee on Development Policy first considered Vanuatu eligible for graduation in 2006 and again in 2009. In 2009, the Committee deferred a decision on graduation while further evidence was sought of the sustainability of Vanuatu's development progress. The CDP subsequently recommended graduation to take place in December 2017, but noted that "smooth transition mechanisms should address, among other things, the impact of the eventual loss of trade preferences as well as how to ensure appropriate access to funds and programmes aimed at reducing the country's vulnerability to natural disasters." In response to Cyclone Pam, the graduation of Vanuatu was postponed for three years by the UN General Assembly. Graduation is now scheduled for 4 December 2020.

Exposure to Natural Hazards

726. According to the UN University World Risk Index, Vanuatu is the world's most at-risk country for natural disasters.³⁴³ Located on the seismically active "Ring of Fire", Vanuatu is highly exposed to geophysical risks arising from volcanoes, earthquakes, and resulting tsunamis and

landslides. Hydro-meteorological hazards include tropical cyclones, floods, and droughts.

727. Between 1980 and 2014, Vanuatu experienced approximately 53 disaster events, of which 46% were earthquakes and 35% tropical cyclones. Floods, volcanic activity, and storm surges make up the rest. Estimates suggest that these events affected around 300,000 people.³⁴⁴ The last 60 years have seen almost 1,000 tropical cyclones with hurricane-force winds, a yearly average of approximately 16. Since 1990, Vanuatu has experienced at least 20 damaging tropical cyclones.³⁴⁵ The most significant cyclones before Tropical Cyclone (TC) Pam in recent years were TC Ivy in 2004 and TC Uma in 1987, each affecting nearly 50,000 people and causing many millions of dollars of destruction (see Table 21 below).

728. Eruptions of the Manaro Voui volcano on Ambae Island prompted compulsory evacuations of the population in September 2017 and again April 2018. Continuous explosions and spewing of volcanic ash made it too dangerous for continued habitation. An explosion on 28 July 2018 launched volcanic material over 12 kilometres into the atmosphere causing cancelation of international flights between Fiji, Solomon Islands and Vanuatu.³⁴⁶ The 11,000 population of Ambae has now been permanently resettled on Maewo island. Nor is Ambae the only island with active volcanoes in the Vanuatu archipelago. On 24 October 2018, the website of the Vanuatu Meteorological and Geo-hazards Department indicated alerts for volcanic activity in operation on a total of six islands.

343 World Risk Index 2015. Available at: <http://www.irdinternational.org/2016/03/01/world-risk-index/>.

344 World Bank (2015) Pacific Catastrophe Risk Assessment and Financing (PCRAFI) Initiative: Country Note, Vanuatu. Available at <https://www.gfdrr.org/sites/default/files/publication/country-note-2015-pcrafi-vanuatu.pdf>.

345 German Development Cooperation (ND) Post-Pam: lessons learned for [German] development cooperation in Vanuatu and the Pacific. Available at <https://www.adaptationcommunity.net/wp-content/uploads/2017/05/PostPam-Study.pdf>.

346 "Ambae state of emergency and off island relocation", 3 August 2018, Government of Vanuatu, Available at: <https://www.gov.vu/en/public-information/646-ambae-state-of-emergency-and-off-island-relocation>.



Table 21: Natural disasters in Vanuatu and their impacts 1980-2014

Disaster type	Event count	Total deaths	Total affected population (approx..)	Total damage (USD million)
Storm – Tropical cyclone	16	79	290,000	205
Earthquake	8	12	15,000	n.a.
Volcano	5	0	19,000	n.a.
Flood	2	0	4,000	n.a.
Storm – Other	1	32	n.a.	n.a.
Tsunami	1	100	n.a.	n.a.
Landslide	1	1	3,000	n.a.
Average per year	1	6	9,500	> 5.9

Source: IMF 2015 based on EMD-DAT³⁴⁷

729. Earthquakes are also a regular occurrence. Data from the United States Geological Survey indicates that 240 earthquakes, ranging on the Richter Scale between a magnitude of 3.3 and 7.1 occurred in the Vanuatu region in the first ten months of 2018. Earthquakes may also generate secondary hazards such as tsunami waves.

730. Another hazard faced by Vanuatu is tropical cyclones. The tropical cyclone season runs from November to April. Vanuatu (land and sea) receives about 2-3 cyclones per season, with the greatest frequency in January and February. On average, Vanuatu and its marginal seas is a common route to some 20 to 30 cyclones per decade, with 3 to 5 causing severe damage. Tropical cyclones result in heavy rain, strong winds, flash flooding, coastal flooding, riverine flooding, storm surge, land slide, very rough seas and strong to damaging winds inland.³⁴⁸

731. Significant cyclone damage has been recorded from Tropical Cyclone (TC) Uma, a category 4 cyclone that caused damage of VT 14.4 billion (US\$150 million), that made landfall in February 1987. More recently, Vanuatu was hit in January 2011 by TC Vania, causing damage of VT 71 million (US\$742,000), or some 6.3% of GDP and affected over 10,000 households.

732. Writing in February 2015, the Pacific Catastrophe Risk Assessment and Financing Initiative predicted that Vanuatu could expect to incur, on average over the long term, annual losses of VT 4.6 billion (US\$48 million) due to earthquakes and tropical cyclones.³⁴⁹ The study found that over “the next 50 years, Vanuatu has a 50% chance of experiencing a loss

exceeding VT 31.6 billion (US\$330 million) from a single event, and has a 10% chance of experiencing a loss exceeding VT 51.8 billion (US\$540 million)”. In fact, Vanuatu had only to wait until March of the same year for an event loss causing damage exceeding VT 31.6 billion (US\$330 million) to occur: Cyclone Pam.

733. Between 12-14 March 2015, category 5 Cyclone Pam struck Vanuatu, with estimated wind speeds of 250 km/h and wind gusts that peaked at around 320 km/h, causing wide devastation and extensive damages. An estimated 65,000 people – about a quarter of Vanuatu’s total population – were displaced from their homes. Approximately 17,000 buildings were damaged or destroyed, including houses, government buildings, schools, clinics, and other medical facilities. Communication across the country was crippled, with only one cellular tower in Port Vila remaining operational, and the power grid was devastated. Four days after the storm, nearly 60 inhabited islands remained cut-off from the outside world.

347 IMF (2015): Vanuatu – Country Report, June 2015 No. 15/149. 2015 Article IV Consultation and Request for Disbursement Under the Rapid Credit Facility and purchase under the Rapid Financing Instrument—Press Release; Staff Report; and Statement by the Executive Director for Vanuatu. Available at <https://www.imf.org/external/pubs/ft/scr/2015/cr15149.pdf>.

348 Tropical cyclone, Vanuatu Meteorological and Geohazards Department, 24 October 2018, <https://www.vmgd.gov.vu/vmgd/index.php/forecast-division/tropical-cyclone>.

349 “Vanuatu – Country Note”, February 2015, Pacific Catastrophe Risk Assessment and Financing Initiative, World Bank Group Available at: <http://pcrafi.spc.int/documents/183>.



Box 40: Tsunami Warning Systems

Since 1968, the Intergovernmental Coordination Group for the Pacific Tsunami Warning System (PTWS) has sought to coordinate efforts to prevent loss of life from ocean-crossing tsunamis. The PTWS, run by the US National Oceanic and Atmospheric Administration (NOAA), provides warnings for Pacific basin tele-tsunamis (i.e. tsunamis that can cause damage away from their source). Information and threat warnings are communicated to national emergency management offices (including the Vanuatu National Disaster Office and Vanuatu Meteorology and Geo-Hazards Department) and other officials. Regular tsunami warnings are issued. One recent example is a tsunami warning was issued for New Caledonia, Fiji and Vanuatu on 29 August 2018 in response to a 7.1 magnitude earthquake off the eastern coast of New Caledonia. In August 2017, a Tsunami Early Warning System was completed with funding from the World Bank and Japan as part of the Mainstreaming Disaster Risk Reduction project.

Source: Intergovernmental Coordination Group for the Pacific Tsunami Warning System³⁵⁰

Table 22: Summary of Tropical Cyclone Pam Disaster Effects by Sector

	Disaster Effect (VT Millions)			Share of Disaster Effects (%)		Lost Personal Income
	Damage	Losses	Total	Private	Public	Vt millions
Productive Sectors	8,526	10,403	18,928	98	2	1,607
Agriculture	1,421	4,641	6,062	93	7	227
Commerce and Industry	1,196	2,152	3,348	100	0	487
Tourism	5,908	3,610	9,518	100	0	983
Social Sectors	14,339	630	14,969	67	33	-
Housing(Private)	9,452	440	9,893	100	0	-
Health	870	107	977	1	99	-
Education	3,908	79	3,987	0	100	-
Culture	109	3	112	100	0	-
Infrastructure Sectors	6,403	2,926	9,329	51	49	-
Transport	3,017	2,137	5,155	43	57	-
Public Buildings	532	12	544	0	100	-
Water	414	284	697	63	37	-
Energy	179	106	285	100	0	-
Communication	2,261	387	2,648	67	33	-
Cross-cutting sector	0	5,328	5,328	0	100	-
Environment	0	5,328	5,328	0	100	-
Grand Total	29,268	19,286	48,554	69	31	1,607

Source: Post-Disaster Needs Assessment 2015.³⁵¹

350 Intergovernmental Coordination Group for the Pacific Tsunami Warning System. Available at: http://itic.ioc-unesco.org/index.php?option=com_content&view=article&id=1179:intergovernmental-coordination-group-for-the-pacific-tsunami-warning-and-mitigation-system-icgptws&catid=1153&Itemid=1153.

351 Post-Disaster Needs Assessment 2015, Tropical Cyclone Pam, March 2015 Government of the Republic of Vanuatu, Available at: <https://dfat.gov.au/about-us/publications/Documents/post-disaster-needs-assessment-cyclone-pam.pdf>.

Impact on the Economy

734. The Post-Disaster Needs Assessment undertaken by the Government of Vanuatu estimated total economic damages caused by Cyclone Pam at approximately VT 48.6 billion, equivalent to 64% of GDP. Sectors that sustained the highest level of damage were the housing (32% of total damage costs) followed by tourism sector (20%), the education sector (13% damage), and the transport sector (10%). The largest economic losses were expected in the agriculture and tourism sectors. The environmental sector also suffered significant losses to ecosystem services, although these losses could not be accounted within the GDP impacts. Table 22 provides further information.
735. The Post-Disaster Needs Assessment predicted that the storm would reduce GDP growth by 2.8% to about 0.2% in 2015, against an expected growth rate of more than 3%. Reconstruction and recovery led by the building and construction sector has had a positive multiplier on economic growth. Economic growth jumped to 4.0% in 2016 and 4.2% in 2017, more than double the rate recorded in 2013.
736. Vanuatu's public debt accelerated in the wake of the Cyclone Pam reconstruction. The stock of public and public guaranteed debt increased sharply from 28.7 percent of GDP in 2014 to 48.8 percent in 2016. This is mainly due to disbursements for infrastructure and reconstruction activities, though the new external borrowing was highly concessional. Vanuatu's public debt is now at the higher end, compared to other Pacific Island countries (PICs).
737. At the WTO Trade Policy Review (TPR) of Vanuatu in October 2018, the Government noted that it had "experienced a construction boom since 2016 which had contributed in sustaining the economy. The overwhelming support from development partners combined with stability in the Government has restored confidence and at the same time reinforced implementation of infrastructure development projects. This has created much needed employment in the industry sector; with spill-over effects felt throughout the economy. This is very important as the Government continues to embark on infrastructure development policy to facilitate trade and at the same time safeguard Government policy on inclusive and sustainable infrastructure development."³⁵²
738. The current account deficit is expected to widen to around 9% of GDP in 2017 and 2018, due to the high import content of infrastructure projects.³⁵³ The current account deficit would continue to be financed by donor grants and loans, as well as foreign direct investment. An IMF Debt Sustainability Analysis (DSA) suggests that the risk of external debt distress in Vanuatu remains moderate, consistent with the 2016 assessment, but the debt service pressure would be on the rise over the medium term.³⁵⁴
739. General budget support from the European Union totalling VT 359.6 million (US\$21.8 million), as well as a VT 202.0 million (US\$38.8 million) insurance pay-out from the World Bank, was released into the recurrent budget for financing recovery-related expenditures. At the same time, grant funding for cyclone recovery operations equivalent to VT 667.4 million (US\$72.02 million) has been received from donors. Information reported to the OECD Creditor Reporting System indicates that Vanuatu received an additional US\$150.7 million in support in 2015, of which US\$ 69.7 million was in the form of humanitarian relief. Disbursements totalled US\$103.2 million in 2016.³⁵⁵
740. Tropical Cyclone Pam triggered an insurance pay-out of US\$1.9 million for the Government of Vanuatu from the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) Program. It provided the Government of Vanuatu with a rapid cash injection in their budget. The pay-out was received by the Government of Vanuatu on 21 March – 8 days after the cyclone.
741. Established in 2007, PCRAFI is a Pacific-wide region joint initiative of the World Bank and the Asian Development Bank, with financial support from the Government of Japan, Global Facility for Disaster Risk Reduction and Recovery, the European Union, and technical inputs by the GNS Science of New Zealand, Geoscience Australia and AIR Worldwide. It was designed to develop the capacity of Pacific Island countries to manage all levels of disaster risk and through a combination of financial and physical mitigation measures. The PCRAFI program is aligned with other regional initiatives such as the Pacific Resilience Program, a World Bank-funded regional program that is designed to strengthen early warning, resilient investments, and financial protection in the Pacific Region.³⁵⁶

352 Trade Policy Review: Vanuatu, Government Report, WT/TPR/G/378, 11 September 2018. Available at: https://www.wto.org/english/tratop_e/tpr_e/g378_e.pdf.

353 "Vanuatu: 2018 Article IV Consultation", April 2018 IMF Country Report No. 18/109. Available at: <https://www.imf.org/en/Publications/CR/Issues/2018/04/26/Vanuatu-2018-Article-IV-Consultation-Press-Release-and-Staff-Report-45821>.

354 Ibid.

355 Source: OECD Query Wizard for International Development Statistics. Available at: <https://stats.oecd.org/qwids/>.

356 "Pacific Islands – Pacific Catastrophe Risk Insurance Pilot Program Project. Washington, D.C., World Bank Group. Available at <http://documents.worldbank.org/curated/en/655341475523018949/pdf/PIC-CatastropheRiskInsurancePilotSmallGrant-ICR-FINAL-09302016.pdf>. World Bank Press Release, New Insurance Facility to Boost Natural Disaster Resilience in Pacific Island Countries. See <http://www.worldbank.org/en/news/press-release/2016/11/02/new-insurance-facility-to-boost-natural-disaster-resilience-in-pacific-island-countries> and 3. PCRAFI Facility: Phase II <http://pubdocs.worldbank.org/en/178911475802966585/PCRAFI-4-pager-web.pdf>.



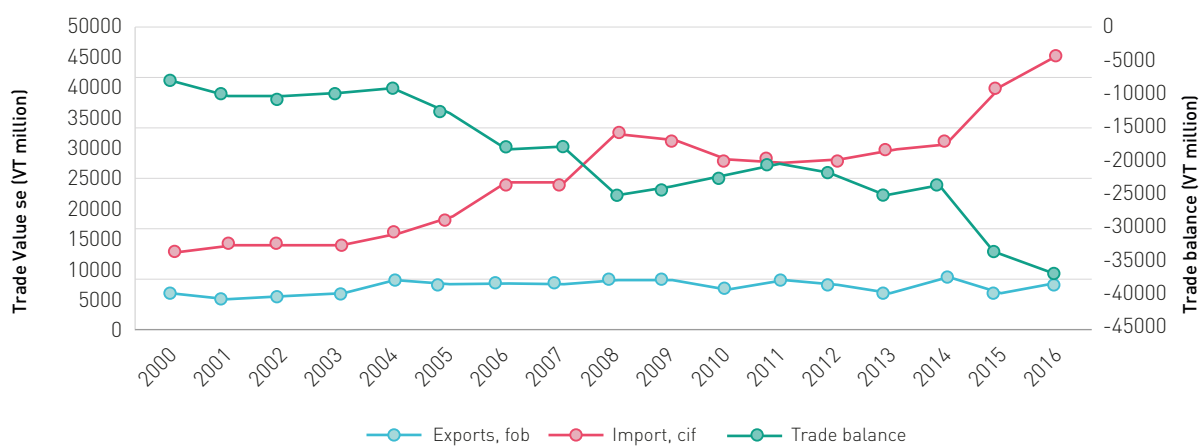
Table 23: Vanuatu: Macroeconomic indicators, 2012-2017

Indicator	2012	2013	2014	2015	2016	2017
GDP growth rate (per cent, constant price)	1.8	2.0	2.3	1.6	4.0	4.2
Inflation rate (%)	1.4	1.4	0.8	2.5	0.9	2.6
Government revenue (billions of national currency)	15.8	16.2	18.6	25.2	24.6	23.3
Government expenditure (billions of national currency)	16.9	16.4	18.0	20.0	29.6	36.2
Government balance (billions of national currency)	-1.2	-0.2	0.6	5.1	-4.9	-12.9
Government balance (per cent of GDP)	-1.6	-0.2	0.8	7.2	-8.5	-8.7
Public and publicly-guaranteed debt (per cent of GDP)		23.1	28.7	42.4	48.8	51.0
Of which external debt		12.6	16.3	30.5	37.6	40.4
Net ODA received (millions of US dollars)*	102	91	100	187	129	n.a.
Current Account	-50.6	-26.4	-2.1	-82.1	-29.5	-120.1
Goods, Credit (Exports)	55	45	63	39	50	57
Goods, Debit (Imports)	253	268	260	308	314	360
Balance on Goods	-198	-223	-197	-269	-264	-303
Services, Credit (Exports)	322	331	307	283	330	342
Services, Debit (Imports)	146	142	141	179	152	159
Balance on services	176	190	166	104	179	184
Balance on Goods and Services	-23	-33	-31	-165	-86	-119

* 2017 data unavailable.

Source: UN/DESA World Economic and Social Prospects (2018); IMF, International Financial Statistics, accessed 10 February 2018. Note, debt values for 2017 and 2018 are estimates and projections.

Figure 34: Exports, imports and trade balance of Vanuatu

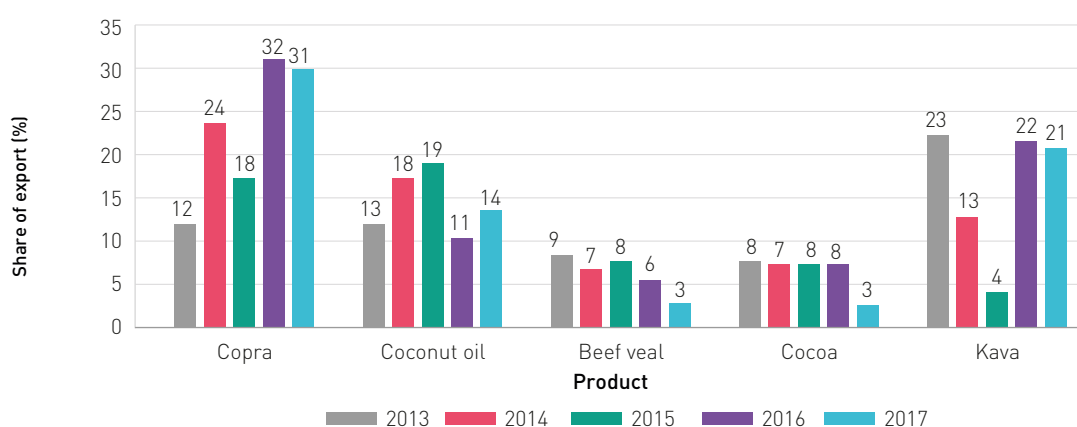


Source: WTO computation based on data from the Asian Development Bank



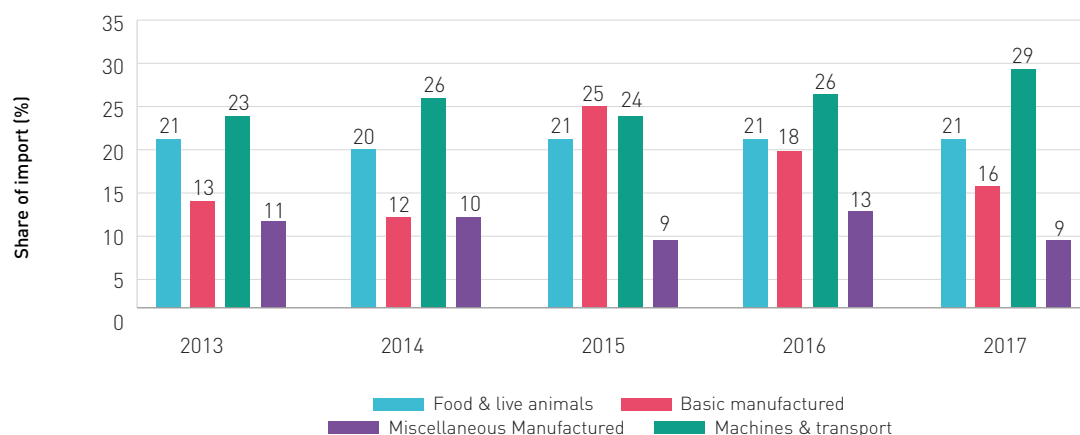
742. The impact of Cyclone Pam on trade in goods was substantial. Vanuatu's merchandise (see Figure 34) exports fell from 6,100 Vt million (US\$62.84 million) in 2014 to 4249 Vt million (US\$ 39.0 million) in 2015 – a decline of 37%. In 2016, exports for trade in goods recovered to 5,446 Vt million (US\$50.2 million). Imports of merchandise goods surged strongly to 39,989 Vt million (US\$366.9 million) in 2015, from 30,435 Vt million (US\$423.0 million and US\$313.5 million) in both 2013 and 2014, representing a growth of 2.6% in 2014 and significant increase to 31.4% leading to the worsening the of the trade balance.
743. The impact on services exports of Cyclone Pam was most strongly felt in the tourism sector. Visitor arrivals by air dropped 17% from 109,000 in 2014 to 90,000 in 2015. Cruise ship visitor arrivals held up more strongly, falling only 8% from 267,000 to 246,000. By 2017, Vanuatu's tourism sector had recovered to pre-Cyclone Pam visitor numbers. Tourism and travel contributed 17.2% of GDP (or US\$ 133.9 million) in 2016. Including jobs and economic activity elsewhere in the economy supported by tourism, the sector is estimated to contribute 37.9% of total employment (28,000 jobs) and 44.5% of GDP.
744. The tourism sector is characterised by two main models: expatriate investors/operators and owner-operators. Four of the five major resorts in Port Vila were badly impacted. For example, it took the Holiday Inn more than 15 months to re-open. The smaller owner-operator guesthouses were quicker to start running again, with cruise ships back and docking again soon after the event. Many business owners who had not procured cyclone insurance folded in the aftermath of the storm, unable to reinvest sufficient savings in their businesses or to tap sources of credit.
745. The World Travel and Tourism Council predicts strong growth of 4.1% per year over the next decade with tourism's contribution to Vanuatu's GDP expected to reach 50.4% of GDP by 2027. Infrastructure investment will be critical to reaching this target. Suspension of services by Air New Zealand and Virgin, and by Qantas of its code share with Air Vanuatu, in January 2016 due to safety concerns over the runway at Port Vila's Bauerfield Airport have limited return to growth in the wake of TC Pam. Completion of the World Bank-funded Vanuatu Aviation Investment Project should expand air links, including with Asian airlines. Investment in upgrading airport capacity should also facilitate future disaster response.
746. The composition of merchandise trade was also heavily affected by Cyclone Pam. The share of traditional export goods fell strongly in 2015, against the background of already declining export income. For example, the share of copra fell from 24% to 18%, while the share of kava fell from 13% to 4%. Although the shares of export of copra and kava recovered in 2016 and 2017, those of beef, veal, cocoa and coconut oil remained lower compared to 2014 values. On the import side, the share of basic manufactured products increased from 12% in 2014 to 25% in 2015 and remained at 18% and 16% in 2016 and 2017 respectively. The share of import of machines and transport increased from 26% in 2014 to 29% in 2017 after a marginal reduction to 24% in 2015.

Figure 35: Shares of selected principal export products



Source: WTO Computation based on data from the Department of Customs and Inland Revenue



Figure 36: Shares of selected principal imports

Source: WTO Computation based on data from the Department of Customs and Inland Revenue

747. On the import side, the share of basic manufactured products increased from 12% in 2014 to 25% in 2015 and remained at 18% and 16% in 2016 and 2017 respectively. The share of import of machines and transport increased from 26% in 2014 to 29% in 2017 after a marginal reduction to 24% in 2015.

748. The financial sector was also affected. In the wake of Cyclone Pam, the share of non-performing loans increased (from 11.1% to 12.6% of total loans), while capital adequacy declined. The accommodative stance of Vanuatu's Reserve Bank, which lowered the statutory reserve deposit (SRD) requirement and the liquid asset requirement alleviated potential liquidity pressure on banks in the aftermath of the cyclone. Insurers were also heavily affected, with total reimbursements related to Pam amounting to VT 5.5 billion (US\$ 51.4 million).

Policy Issues

749. In the view of the IMF, internalizing the risks to growth associated with natural disasters and boosting the readiness to respond and manage their destructive force is critical to Vanuatu's development strategy. Lessons from Cyclone Pam highlight that while the ex-post response was satisfactory, more ex-ante measures could be undertaken, including in the areas of resilient infrastructure, and improving coordination with development partners. [IMF 2018].³⁵⁷

750. In 2006 Vanuatu adopted a Disaster Risk Reduction and Disaster Management National Action Plan. This Plan has as its objective to: mainstream disaster risk reduction into economic policy making, strengthen disaster management, and contribute to capacity making in disaster risk reduction and

management. While the Action Plan does not make any specific reference to trade measures, it recognizes the crucial role of maritime transport in the case of natural disasters. Vanuatu adopted the Climate Change and Disaster Risk Reduction Policy for 2016 – 2030 with the aim to enhance environment and economy resilience to the impacts of climate change and disaster risks.³⁵⁸ In 2017, the Vanuatu Business Resilience Committee was formed as a coordinating mechanism for the government to engage with the private sector to build resilience to disasters.

751. "Vanuatu 2030: The People's Plan" sets five targets that will accompany the move to a strong and resilient nation in the face of climate change and disaster risks. These objectives are to: institutionalise climate change and disaster risk governance and build institutional capacity and awareness; improve monitoring and early warning systems; strengthen post-disaster systems in planning, preparedness, response and recovery; promote and ensure strengthened resilience and adaptive capacity to climate related, natural and man-made hazards and access available financing.

752. In the event of a natural disaster, the Director of Customs, upon the suggestion of the National Disaster Management Office, may grant duty exemptions to certain tariff lines, provided that the goods are for disaster relief, are funded by foreign states or international organizations, and are intended for free distribution for use in declared disaster areas. This was the case after Cyclone Pam struck in March 2015. As a result, fiscal revenue forgone on imports (tariffs, VAT and excise tax) due to exemptions and concessions peaked in

³⁵⁷ "Vanuatu 2018 Article IV Consultation", IMF April 2018, IMF Country Report No. 18/109, International Monetary Fund.

³⁵⁸ Government of Vanuatu "Vanuatu Climate Change and Disaster Risk Reduction Policy 2016 – 2030". Available at: https://www.nab.vu/sites/default/files/nab/vanuatu_cc_drr_policy_minus_att4v4.pdf.

2015, at VT 4 billion, as compared to VT 1 billion in 2013 and VT 1.5 billion in 2014.

753. Upon its WTO accession to the WTO on 24 August 2012, Vanuatu committed that it would fully apply all WTO provisions, and did not require recourse to any transitional period except on intellectual property and on the publication of trade information. Vanuatu bound all its tariff lines with an average final bound rate of 40.2%. It grants at least MFN treatment to all its trading partners. Vanuatu made specific GATS commitments on 10 services sectors.
754. Vanuatu's tariff schedule remained broadly unchanged after TC Pam. However, following a request of a domestic producer for increased protection after being struck by the Cyclone, the tariff on chicken wings, parts and offal (HS 02071410) was increased to 30%, although bindings are at 20%.
755. A report by the IFRC highlights that TC Pam exceeded national disaster response capacity. The Government issued its first ever generalized appeal for international assistance, and this prompted an international response that far exceeded anything previously experienced on the island nation.

Scores of international organizations, international NGOs and bilateral partners including foreign militaries flooded into the country, many with minimal knowledge of national actors, institutions and established ways of working. Against such a backdrop, coordination proved challenging among the humanitarian community, and with the national authorities.³⁵⁹

756. A specific challenge in the aftermath of Cyclone Pam was an unusually high number of consignments of "unsolicited goods", many of them donations by smaller charity groups and sometimes including goods that were not appropriate to the needs of the post-disaster situation. In this context, a representative of a major international humanitarian organization reported that this strong inflow of unsolicited goods led to substantial delays in the clearance of goods, and to the payment of considerable storage fees. To regain ownership of the response, the Vanuatu Government temporarily halted all aid distributions to ensure greater cooperation and communication. Vanuatu Red Cross was the first humanitarian agency sanctioned to distribute relief supplies.³⁶⁰ Recognizing its capacity, the Vanuatu Red Cross has been legally established.

Box 41: Unsolicited Bilateral Donations

Unsolicited Bilateral Donations (UBDs), also called Gifts in Kind, are unsolicited material donations are goods that are spontaneously donated after a disaster. They arrive unannounced or with very short notice, often have incomplete or faulty paperwork, lack a clearly defined consignee, are nonstandard items and have incorrect packaging.

During TC Pam, Vanuatu received over 70 containers (both 20- and 40-foot containers) of UBDs. Many of these containers took up valuable wharf and storage space and placed additional pressure on an already stretched humanitarian logistics response system.

Ten months after the cyclone there were still 18 containers of UBD's on the wharf, which had accumulated approximately USD\$1.5 million dollars in storage, handling and container rental fees. The management of UBDs in Vanuatu was further exacerbated by the lack of a computerised system to receive and process cargo at the ports of entry.

Of the UBDs sent to Vanuatu, 50% of food items were expired by the time they were accessed and were destroyed at the cost of the government. As published in the Vanuatu Daily Post, a year after the cyclone, the Vanuatu National Disaster Management Office (NDMO) authorised that tonnes of food aid be dumped because they were expired, including cans of beans and tomatoes, canned fish (which take up 100 years to breakdown in landfill), packets of noodles and flour.

Moreover, a significant volume of the used clothes, shoes, bedding and other such items received in this way were inappropriate for the Vanuatu culture, living conditions and climate. These included high heels, heavy blankets, handbags and woollen knitwear amongst others. The total cost to the Vanuatu government to manage the 70+ containers is difficult to quantify, but it is acknowledged that this money would have been better spent on the response and recovery efforts of the country. Vanuatu's experience has changed its stance on UBDs. NDMO urges all donor agencies to support response efforts through cash donations rather than solicited goods.

Source: Australian Red Cross³⁶¹

359 "From law to action: Saving lives through International Disaster Response Law. The case of Vanuatu, Ecuador and South Sudan", International Federation of Red Cross and Red Crescent Societies, Geneva, 2017. Available at <https://media.ifrc.org/ifrc/wp-content/uploads/sites/5/2017/12/IDRL-Advocacy-Brochure-Final-LR.pdf>.

360 Idem.

361 "The challenges of Unsolicited Bilateral Donations in Pacific humanitarian responses", 2017, Anna Young, Australian Red Cross. Available at: <https://www.redcross.org.au/getmedia/2e9546d3-5dd9-42ba-9c8c-3b5ac380343a/161220-Report-Challenges-of-UBD-in-Pacific.pdf.aspx>.



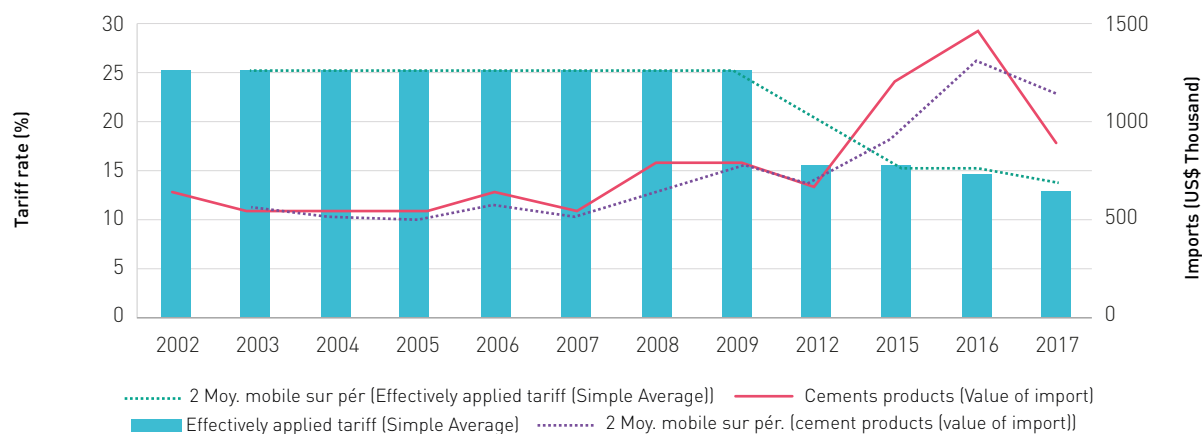
757. TC Pam provided a stimulus for legal reform. The existing National Disaster Act needed to be updated to enable the government to be better prepared for the common legal problems related to emergencies and international assistance. Before the new law could come into effect, in early May 2017, Tropical Cyclone (TC) Donna made landfall in Torba Province of the Torres Islands, the northernmost island group in the country. Requests and provisions of international technical assistance were much more specific and coordinated during TC Donna. The Government of Vanuatu was in direct communication with the Pacific Humanitarian Team and other partners to request specific technical skills. Donors were more closely engaged and responded to needs communicated from the government based on information provided through its coordination mechanisms. Though the needs in TC Donna were not as great, the structure of the NDMO and coordination architecture from national to provincial level was in a much better position to request and absorb international support.³⁶²
758. Cyclone Pam also revealed capacity problems at port facilities. The ports of Port Vila and Luganville are Vanuatu's only two international maritime hubs for international passenger traffic and trade in goods. Ports in the outer islands are not equipped to receive larger vessels. A representative of a major international humanitarian organization reported that in the aftermath of Cyclone Pam the only major berth in Port Vila was frequently occupied by cruise ships, while cargo vessels with relief goods had to wait up to several days to be unloaded. However, since 2015 both ports have undergone significant improvements and expansion, so that in the meantime the situation has already improved in Port Vila.
759. While foreign ownership of vessels over 80 tons has been allowed since 1999, which contributed to significant improvements in maritime transport, cabotage is not permitted in Vanuatu. However, an exemption can be issued in case of natural disasters. This was the case in the aftermath of Cyclone Pam. The exemption allowed vessels of the Australian and New Zealand navies, which were present in the region at the time of the disaster, to be engaged in the delivery of relief goods to remote islands. The temporary lifting of the cabotage requirement and the engagement of foreign vessels was particularly useful as domestic transport capacity was very limited and some of the few places on domestic flights were taken by international media representatives that reported on the disaster.
760. The IMF report suggests that Cyclone Pam highlighted the need for both ex-ante and ex-post measures to contain the impact of future natural disasters. Such measures include the support by Vanuatu's authorities for households' reconstruction needs by suspending VAT and import duties on construction materials, steps taken by Reserve Bank of Vanuatu (RBV) to alleviate liquidity constraints by reducing the Statutory Reserve Deposit (SRD) requirement, and implementation of business continuity plan by banks to ensure that most households and businesses had enough physical currency. (IMF, 2018).
761. A policy measure that could have positive effects for resilience of infrastructure is reduction of tariffs imposed on building materials. Upon Vanuatu's accession to the WTO on 24 August 2012, tariff rates for import of stone, plaster, cement, asbestos and mica (see Figure 37) were reduced from 25% and bound to 15%. Imports grew 50% from less than US\$0.8 million to US\$1.2 million. A further liberalization to 12.2% in 2016 (a year after the TC Pam) led imports to grow to US\$1.4 million. Duty free imports under the MSG Agreement and the entry into force of the PACER Plus Agreement, would support this policy objective.
762. Although Figure 38 does not depict a clear relationship between taxes and import of iron and steel, the linear prediction suggests a higher volume of import at relatively low tariff rates between 2009 and 2016. Important to consider also is the expansion of infrastructure projects which have increased demand for these materials.
763. Trade facilitation will support efficient disaster response, Vanuatu has made progress towards reducing the cost of import since 2012.³⁶³ The cost of import (see Figure 30) fell from US\$1,690 in 2012 to US\$864 in 2016. This reflects streamlining in customs processes, such as import documentary compliance. Figure 39 shows that further progress could be made to reach the same level as East Asian peers.
764. Two trade policy measures that Vanuatu has taken to reduce trade costs include adoption of legislation to give effect to the WTO Agreement on Customs Valuation and streamlining of customs. Recently the government has embarked on a single window project to expand reform of business processes and streamlining through system automation to non-customs agencies. Box 42 discusses Vanuatu's implementation of the Trade Facilitation Agreement.

362 "From law to action: Saving lives through International Disaster Response Law. The case of Vanuatu, Ecuador and South Sudan", International Federation of Red Cross and Red Crescent Societies, Geneva, 2017. Available at <https://media.ifrc.org/ifrc/wp-content/uploads/sites/5/2017/12/IDRL-Advocacy-Brochure-Final-LR.pdf>.

363 World Bank Doing Business, Ease of Doing Business in Vanuatu, Available at: http://www.doingbusiness.org/en/data/exploreeconomies/vanuatu#DB_tab.



Figure 37: Tariffs and imports of stone, plaster, cement, asbestos and mica



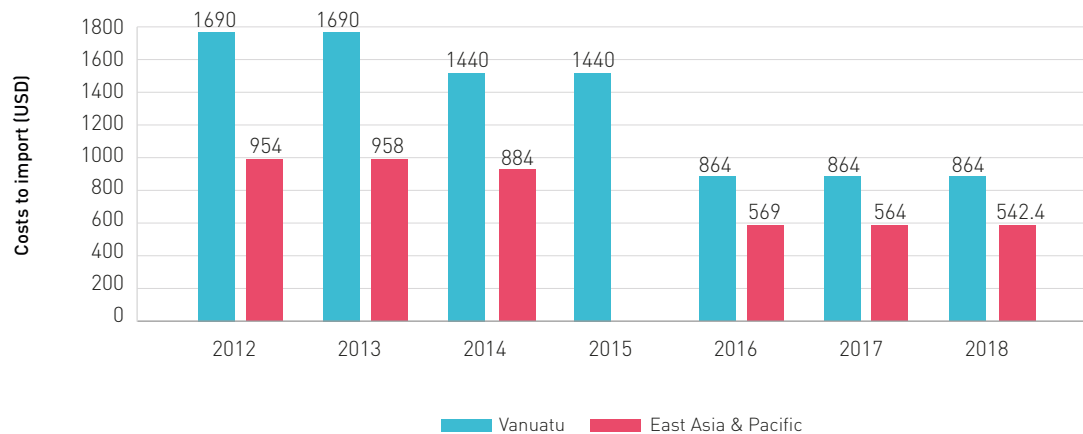
Source: WTO computation based on data from WITs

Figure 38: Tariffs and imports of iron and steel in Vanuatu



Source: WTO computation based on data from WITs

Figure 39: Cost to import in Vanuatu



Source: WTO computation based on data from WITs



Box 42: Vanuatu: Trade Facilitation Agreement commitments

At the time of writing, Vanuatu had not deposited its instrument of acceptance of the Trade Facilitation Agreement (TFA). In January 2018, it notified to the WTO its commitments in Categories A, B, and C with indicative dates for implementation (for Categories B and C). WTO Secretariat analysis suggest that 49% of measures have been implemented with other areas measures requiring more time or technical assistance for implementation evenly split (26.1% in category B (more time) and 24.8% in category C (support)). Indicative dates for implementation of category B and C commitments stretch to December 2022.

Vanuatu has requested assistance and support for capacity building for a total number of 12 TFA measures. These include: publication, making information available through the internet, enquiry points, notification, detention of goods, test procedures, risk management, post clearance audit, average release times, authorized operators, use of international standards and single window.

Source: WTO Trade Facilitation Agreement Database

765. Cyclone Pam affected Vanuatu's schedule for graduation from LDC status. Vanuatu was initially scheduled for graduation in 2017, but in December 2015 the UN General Assembly decided, on an exceptional basis, and taking into consideration the serious disruption that was caused by the Cyclone, to delay to December 2020 the country's graduation from LDC status. Though Vanuatu would lose access to LDC-specific instruments of development cooperation, it has been observed that development partners do not base their cooperation exclusively on LDC status.³⁶⁴ The UN recognizes the importance of a smooth transition mechanism to avoid reversal of the progress made by the graduating countries.
766. Fiji is a middle-income country located in the South Pacific with a GDP per capita estimated at around US\$6,120.4 in 2018 and a population of 885,000 based on 2017 estimates. Fiji is an archipelago of 332 islands (of which approximately 110 are inhabited), spread over a land area of 18,270 km² and a geographic area of almost 50,000km². Compared to other Pacific island countries, the economy is more diversified, with services, led by tourism (a major net foreign exchange earner), as the most important sector in terms of contribution to GDP.
767. World Travel and Tourism Council figures indicate that travel and tourism contributed USD1,966.3 million, (40.3% of GDP) in 2017, and was projected to increase by 1.4% in 2018, and a further increase by 5.0% pa to USD3,242.4 million (43.4% of GDP) in 2028. This includes direct contribution of (USD704.8 million (14.4% of the total GDP) in 2017, forecast of 1.4% in 2018 and 5.3% per annum between 2018 and 2028.³⁶⁵
768. The travel and tourism sector contributed 36.5% of total employment (118,500 jobs) which was expected to fall by 1.2% in 2018 (117,000 jobs) and rise by 2.7% pa to (153,000 jobs) in 2028 (43.7% of total). This include direct contribution of 42,500 jobs (13.0% of total employment) which was expected to fall by 1.2% in 2018 and rise by 3.3% pa to 58,000 jobs (16.5% of total employment) in 2028.
769. Visitor exports generated (USD\$1,194.8 million), 40.1% of total exports, forecast to grow by 1.1% in 2018, and 5.5% pa, (USD2,071.2 million) in 2028, (41.6% of total). Travel and tourism investment in 2017 was 24.3% of total investment (USD236.7million). It was projected to rise by 1.4% in 2018, and rise by 3.4% pa over the next ten years to USD336.1 million in 2028, 22.7% of total.³⁶⁶ Nevertheless, Fiji's economy has a relatively narrow production structure heavily dependent on tourism, remittances, and a few merchandise products such as water, sugar, fish, and textile.
770. Over the last years, Fiji has improved its human development indicators, achieving broad coverage in the provision of basic services, with declining poverty levels even though progress in rural areas has proved more stubborn to realize. Fiji ranks 88th (out of 187 countries) on the latest UNDP Human Development Index. In 2013, the last year for which figures are available, 28.1% of the population lived below the national poverty line. Life expectancy is about 70 years while adult literacy is above 95%. Percentage change in year-on-year inflation rate in 2018 was 3.3% whereas unemployment rate as percentage of the labour force has remained 4.5% since 2017.

364 "Vanuatu 2018 Article IV Consultation", IMF April 2018, IMF Country Report No. 18/109, International Monetary Fund.

365 World Travel & Tourism Council (2018). Travel & Tourism Economic Impact 2018 Fiji. Available at <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/fiji2018.pdf>.

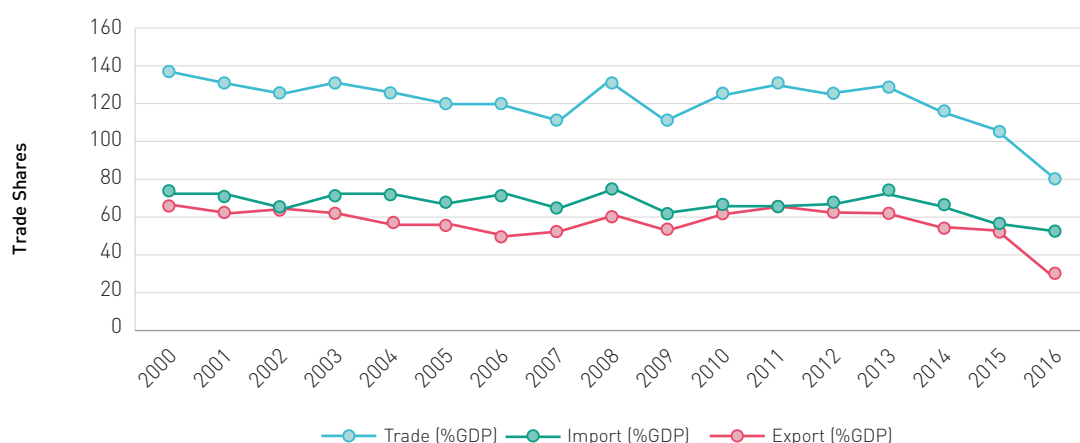
366 Ibid.



771. Fiji's trade as a share of GDP (see Figure 31) was negatively impacted by the two cyclones (Evan and Winston) which hit the country in 2012 and 2016. Tropical Cyclone (TC) Winston had a more severe impact than that of TC Evan. Total trade as a share of GDP decreased by 3.3 percentage point from 128.0% in 2011 to 124.7% in 2012. However, the decrease was 27 percentage points from 105.5% in 2015 to 78.0% in 2016. On both occasions, the fall in export as share of GDP has been considerably higher than import as share of GDP.

772. While TC Evan contributed to a decrease in import as share of GDP by 1 percentage point (from 65.2% to 64.2%), export as share of GDP decreased by 2.3 percentage points from 62.8% in 2011 to 60.5% in 2012. Similarly, import as share of GDP decreased by 4 percentage point from 55.6% in 2015 to 51.6% in 2016. This unequal decrease in export and import as shares of GDP reflect the worsening trade balance (see Figure 40).

Figure 40: Trade as a share of GDP



Source: WTO Secretariat

Disaster Risk Profile of Fiji

773. Fiji is located in a tropical cyclone belt and is prone to frequent storms with damaging winds, rain and storm surges. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude almost 1,000 tropical cyclones with hurricane-force winds were spawned in the last 60 years, with an average of about 16 tropical storms per year. Fiji has been affected multiple times by devastating cyclones in the last few decades. Tropical Cyclone (TC) Kina and TC Ami, in 1993 and 2003 respectively, caused about 40 fatalities. Strong winds and widespread coastal flooding damaged homes, infrastructure and crops in the main islands of Viti Levu and Vanua Levu with about USD 200 to 300 million in losses that weakened the local economy. Since 2010, Fiji has been hit by multiple cyclones. In 2012, Fiji experienced severe flooding in January and March, and Tropical Cyclone (TC) Evan in December.

774. Fiji is situated in a relatively quiet seismic area, albeit surrounded by the Pacific Ring of Fire which aligns with the boundaries of the tectonic plates. These boundaries are associated with extreme

seismic activity, volcanic activity, earthquakes and tsunamis. Fiji's geographical location makes it more susceptible to extreme events associated with climate variability, including sea-level rise, temperature extremes and droughts.

775. The effects of natural disasters have been far reaching for Fiji, negatively impacting on, among other sectors, agriculture, housing, transport infrastructure, tourism and primary industries. Since 1980, disaster events in Fiji have resulted in average annual economic damage of around F\$35 million and impacted around 40,000 people each year. In the same period, at least 186 people have been killed by flooding and storm events alone. The three events that hit Fiji in 2012 caused an estimated total damage of F\$146 million (US\$78 million) (Government of Fiji, 2013).

776. Fiji is expected to incur, on average, F\$158 million (US\$85 million) per year in losses. In the next 50 years, Fiji has a 50% chance of experiencing a loss exceeding F\$1.5 billion (US\$806 million), and a 10% chance of experiencing a loss exceeding F\$3 billion (US\$1.6 billion). However, these figures may increase once the impacts of climate change



are taken into consideration (Government of Fiji, 2016).³⁶⁷

777. The country is especially vulnerable to floods and tropical cyclones, which already have significant impacts on the economy and population. The average asset losses due to tropical cyclones and floods are estimated at more than F\$500 million per year, representing more than 5% of Fiji's GDP. (Government of Fiji, 2016).³⁶⁸

778. Much larger losses are experienced after rarer events. For instance, a 100-year fluvial flood could cause asset losses in excess of F\$2 billion. Asset losses are particularly large for the transport sector and for buildings (46% and 44% of the total respectively, excluding agricultural asset losses). Other natural hazards—such as drought and landslides—could not be quantified in this study but add to these risks. For instance, the economic losses caused by Fiji's 1998 drought were estimated

at between F\$275 million and F\$300 million. (Government of Fiji, 2016).³⁶⁹

779. The World Risk Report ranks Fiji 10th out of 171 countries that are most at risk from natural disasters³⁷⁰. Exposure to cyclones, earthquakes, floods, landslides and droughts, frequent natural disasters, coupled with high transportation costs due to the small size of its economy represent a major constraint to Fiji's growth prospects.

780. Since 1985, Fiji has experienced several disasters which caused deaths and damages worth millions of dollars to properties. Although the number of casualties due to disasters (see Table 24) was higher in the 1990s, the frequency of the disasters and number of people affected have increased in recent years. This trend can be partly ascribed to the worsening climatic conditions amidst cumulative impact of policies aimed at improving resilience and sensitization of the populace.

Table 24: Distribution of disasters and their effects in Fiji

Period of disaster	Number of disasters	Total population affected	Total deaths
1985-89	6	218600	34
1990-99	11	73500	60
2000-09	15	302792	51
2010-14	6	225654	8

Source: Adapted from Johnston (2015).

Economic Impact of Tropical Cyclones

781. Tropical Cyclone Evan, a Category 4 cyclone, hit Northern Vanua Levu and Western Viti Levu on 16-17 December 2012, causing damage equivalent to 2.6% of GDP. The impact of Evan compounded the damage experienced by some of the same communities and businesses in the wake of the Western Floods of January and March 2012. In February 2016, Tropical Cyclone Winston followed – the first Category 5 cyclone to directly impact Fiji and the most intense cyclone on historical record to have hit the island. This storm affected over 62% (540,400) of Fiji's population causing damage and losses estimated at 31% of GDP.³⁷¹

782. While TC Evan reduced economic growth by 0.1 percentage points, the impact of TC Winston was far more pronounced at 2.5 percentage points. The

estimated value of disaster effects arising from TC Winston in Fiji was F\$1.99 billion (US\$0.9 billion), including F\$1.29 billion (US\$0.6 billion) in damage (i.e., destroyed physical assets) and F\$0.71 billion (US\$0.3 billion) in losses. The combined value of the destroyed assets and disruptions in the production of goods and services was equivalent to about 20% of Fiji's 2014 gross domestic product. TC Winston caused a contraction in labour demand, resulting in the loss of 14.4 million workdays (equivalent to approx. 50,000 full-time jobs) and F\$351.5 million in personal income across the economy. The agricultural sector suffered 57% of these losses, commercial and manufacturing activities 17% and 10% respectively and tourism and transport 8%.

783. The government's fiscal deficit increased from 3.8% in 2015 to 5.5% in 2016 due to the need for increased expenditure on disaster relief and early

367 Government of Fiji (2016): Post-Disaster Needs Assessment, Tropical Cyclone Winston. Available at <https://reliefweb.int/report/fiji/fiji-post-disaster-needs-assessment-may-2016-tropical-cyclone-winston-february-20-2016>.

368 Ibid.

369 Ibid.

370 World Risk Report 2018 Available at <https://reliefweb.int/sites/reliefweb.int/files/resources/WorldRiskReport-2018.pdf>.

371 Government of Fiji (2017) "Climate Vulnerability Assessment – Making Fiji Climate Resilient", Available at: <http://documents.worldbank.org/curated/en/163081509454340771/pdf/120756-WP-PUBLIC-nov-9-12p-WB-Report-FA01-SP.pdf>.



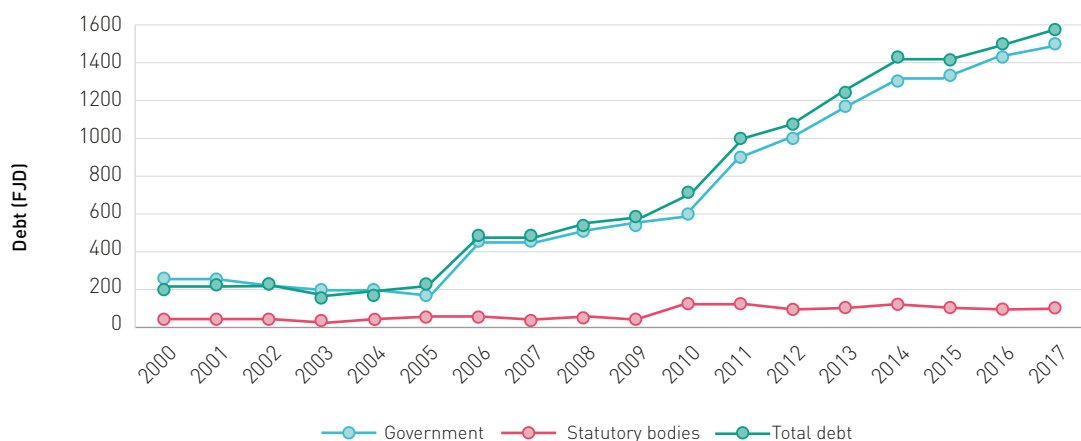
recovery activities, specifically for social welfare programmes and food ration distribution. In terms of impacts on revenue, income from value added tax and Service Turnover Tax declined due to losses in the tourism sector. The Central Bank's accommodative stance helped prevent disorderly liquidity drain after the disaster and facilitated the recovery. Although headline inflation temporarily increased, to over 5%; the jump was mainly a reflection of the slow recovery of food production.

784. TC Winston reduced economic growth by 2.5 percentage points relative to the 2016 pre-cyclone forecast, bringing the growth rate down from 3.8% to 1.3%. Both storms had similar impacts at the sectoral level, agriculture, forestry, commerce, hotels and restaurants accounting for 87% of total losses. Reduced agriculture sector production and lower revenues in the hotels and restaurants sector caused by lower visitor arrivals were the main effects. Infrastructure, including transport, electricity, communications, government buildings and housings suffered comparatively less damage.
785. The impact of TC Winston on the balance-of-payments (see Figure 41) was substantial. Export growth in 2016 declined to 3.5% relative to pre-cyclone forecasted levels of over 17%. Across individual sectors, sugar exports were most affected. Sugar cane production fell by 25% from 1,845 tonnes in 2015 to 1,387 tonnes in 2016 – leading to a drop of 44% reduction in exports of sugar. Foreign exchange from export of sugar decreased from US\$76.9 million in 2015 to US\$52.3 million in 2016. TC Evan in 2012 also

depressed sugar production by 26% and molasses manufacture by 60%. Other exports severely affected by the cyclones included molasses, timber, fish, fruit and vegetables, coconut oil, gold, garments and mineral water.

786. Successive tropical cyclones have aggravated a worsening debt situation created by the global financial crisis of 2008-9. Government debt as a percentage of GDP is projected at 47.3 by the IMF in 2018.³⁷²
787. Import growth surged 11.3 percentage points in the wake of TC Winston in 2016, mostly due to the need of reconstruction material and higher food imports due to the loss of locally grown produce. However, a few product categories experienced a decline in imports, such as mineral fuels. At the same time, the cyclone had only a small impact on the tourism sector, with a short-term drop in international arrivals. The current account deficit widened from 3.6% of GDP in 2015 to 5% in 2016. Fiji's external debt (see Figure 41) increased significantly and have remained higher than the pre-disaster period.
788. The sugar industry contributes about 5% to Fiji's economy. The onset of TC Winston contributed to a fall in the quantity of sugar production (see Figure 43) by about 26% from 2,096 tonnes in 2011 to 1,546 tonnes in 2012. The production of sugar has remained consistently lower than pre-disaster values reflecting in a lag effect on its quantity and value of export in the post-disaster period. [Government of Fiji, 2016].³⁷³

Figure 41: External general government debt

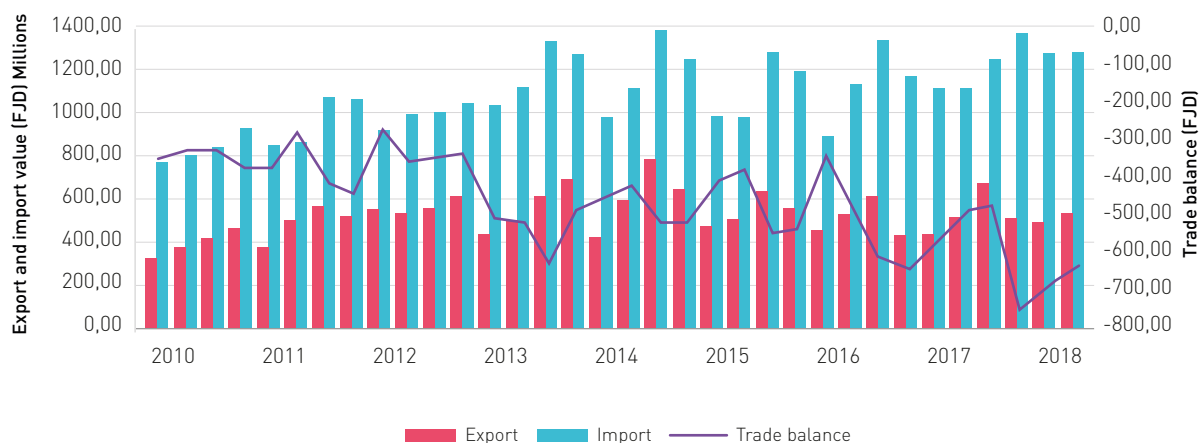
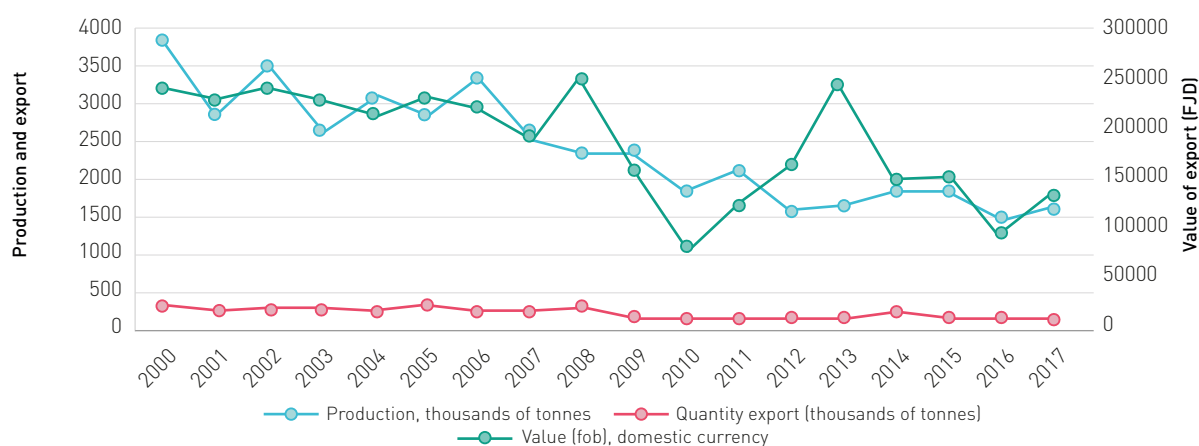


Source: WTO computation based on data from the Reserve Bank of Fiji³⁷⁴

372 Republic of Fiji, IMF Article IV public consultation, IMF Country Report No. 18/34, February 2018. Available at: <https://www.imf.org/en/News/Articles/2018/12/17/pr18479-imf-staff-completes-2018-article-iv-visit-to-fiji>.

373 Government of Fiji (2016): Post-Disaster Needs Assessment, Tropical Cyclone Winston. Available at <https://reliefweb.int/report/fiji/fiji-post-disaster-needs-assessment-may-2016-tropical-cyclone-winston-february-20-2016>.

374 The data from the Reserve Bank of Fiji is available at <https://www.rbf.gov.fj/Statistics/e-GDDS>.

Figure 42: The trend of merchandise trade and trade balance in FijiSource: WTO computation based on data from the Reserve Bank of Fiji³⁷⁵**Figure 43: Sugar industry production and export**

Source: WTO computation based on data from the Reserve Bank of Fiji

789. Cyclones Evan and Winston imposed the highest production losses on the agricultural sector. High winds, flooding and storm surges imposed substantial damage to permanent plantations. Produce for fruit and vegetable export sustained considerable damage. The sub-sector of agriculture most affected by TC Evan was crops (67% of damage and loss in the agriculture sector). In the forestry sub-sector, the timber industry in the Western Division suffered from high winds damage to infrastructure and trees – accounting for the remaining 14 percent. Agricultural production is not expected to return to pre-disaster levels for five to 10 years. [Government of Fiji, 2016].³⁷⁶

790. Cyclone damage to mangrove forests and coral reefs, which provide a habitat for fish species, forced the fish to migrate leading to a reduction in the volume of fisheries and slowdown in the activities of workers in that sector. Table 25 below gives an overview of the sectoral impact of TC Winston.

791. The service sector is the backbone of Fiji's economy. Growth of trade in services has been robust and resilient to both internal and external shocks since 2010. Trade in service has remained a buffer against shocks in merchandise trade. The surplus in trade in services has grown from FJD 1.032 billion in 2010 to a FJD 1.717 billion in 2017.

³⁷⁵ The data on all the indicators obtained from the Reserve Bank of Fiji can be accessed at <https://www.rbf.gov.fj/Statistics/e-GDDS>.

³⁷⁶ "Government of Fiji (2016): Post-Disaster Needs Assessment, Tropical Cyclone Winston". Available at <https://reliefweb.int/report/fiji/fiji-post-disaster-needs-assessment-may-2016-tropical-cyclone-winston-february-20-2016>.

792. The impact of TC Evan on the tourism industry was considerable. Most of the structural damage to hotels and resorts was minimized due to the high building standards. Insurance plays a vital role in this sector with most of the seriously affected hotels/resorts relying on those funds to repair or rebuild without relying on the Government for

financial assistance. While TC Evan caused some damage to infrastructure and the environment, the reaction of the national authorities through the Tourism Disaster Committee to mitigate and subdue any negative impact on future tourist arrivals effect was a key feature of the resilience within the tourism industry.

Table 25: Summary of the sectoral effects of TC Winston

	Disaster effects (F\$ million)			Share of disaster effects (%)	
	Damage	Losses	Total	Public	Private
Productive Sectors	241.8	594.5	836.3	12	88
Agriculture	81.3	460.7	542	7	93
Commerce and Manufacturing	72.9	69.9	142.8	49	51
Tourism	76.1	43.9	120		100
Mining	11.5	20	31.5		100
Social Sectors	827.9	40	867.9	12	88
Education	69.2	7.4	76.6	100	
Health	7.7	6.2	13.9	100	
Housing	751	26.4	777.4	2	98
Infrastructure Sectors	208.2	40.4	248.6	84	16
Transport	127.1	2.4	129.5	98	2
Water and Sanitation	16.9	7.9	24.8	100	
Electricity	33	8.1	41.1	100	
Communications	31.2	22	53.2	30	70
Cross-Cutting Issues	239.6	660.1	899.7	4	96
Environment	232.5	629.8	862.3		100
Culture and Heritage	5.1	0.8	5.9	23	77
Disaster Risk Management	2	29.5	31.5	100	
Total (Excluding Environmentc)	1,285.00	705.2	1,990.20	78	22
Grand Total	1,517.50	1,335.00	2,852.50	84	16

Source: Estimations by PDNA Assessment Team.

- A breakdown of the public/private ownership for damage and loss (rather than the cumulative breakdown for disaster effects) is provided in Annex 1.
- Estimation of environmental losses include ecosystem service losses for 2016-18 for native forests, mangroves and coral reefs. Total recovery time may stretch beyond this timeframe.
- These figures exclude the environment sector, as environmental assets and flows of environmental services are not included in the national accounts.



Box 43: Post-disaster needs assessments

Fiji has undertaken two post-disaster needs assessments, one in 2012 after the passage of TC Evan and another after TC Winston in 2016. Learning from the previous experience, the government of Fiji extended the 2016 PDNA data beyond immediate recovery planning to finalize a multiyear strategic national development plan that was being prepared when the disaster occurred.

The government facilitated a rapid and timely conduct of the 2016 PDNA by providing considerable staff and operational support. The entire PDNA exercise and official adoption of the assessment report was completed within little more than a month. One reason for the rapid completion of the assessment was to present damage estimates to participants attending the World Humanitarian Summit in Istanbul in May 2016. This timely arrangement succeeded in raising more than \$150 million from nearly 20 countries and four international or intergovernmental organizations.

Source: Post- Disaster Needs Assessment PDNA: Lessons from a Decade of Experience 2018³⁷⁷

793. The biggest loss from TC Winston came from the damage to houses where only 12% of the adult population had some form of insurance. Most households had to bear the rebuilding cost and lack of liquidity was a major challenge for most households hit by the disaster. To overcome liquidity constraints, the Fiji National Pension Fund allowed members to withdraw up to 30% of their pension savings account balance. Fiji has not scheduled any GATS commitments for insurance services.
794. TC Evan affected approximately 5% of the total housing stock in Fiji. This translated into a total number 8,497 affected houses of which 2,094 were destroyed, while the remaining 6,403 suffered some degree of damages. The total value of damage and loss for the Housing sector has been estimated at just over F\$50 million (see Box 43).
- Policy Issues**
795. Fiji's disaster management arrangements are covered under the Natural Disaster Management Act 1998 and the National Disaster Management Plan 1995. The Act instituted the National Disaster Management Council and Office and a Preparedness Committee. In the aftermath of Cyclone Winston, the National Disaster Management Office coordinated the government's short-term response (food security support, cash transfers) and the support from the international community. Prior to Cyclone Winston making landfall, the disaster management machinery was set in motion with the activation of the emergency and evacuation centres. Fiji's existing National Climate Change Policy, Green Growth Framework, Fiji National Development Plan and the National Determined Contribution Implementation Roadmap are also part of Fiji's policy efforts to combat the impact of climate change and the loss and damage caused by the natural disasters.³⁷⁸
796. In the aftermath of TC Winston, the government implemented a range of social protection programmes to support households, including the provision of additional funds to households via the Poverty Benefit Scheme, the Food Voucher Programme and the Help for Homes initiative, which provided affected households with vouchers for housing rehabilitation and reconstruction. Also, the "Build Back Safer" program was launched aiming to teach residents how to rebuild homes more resilient to natural disasters.
797. In response to a strong desire for improved coordination and private sector engagement, the Fiji Business Disaster Resilience Council was formed in July 2016. The Council (1) provides a coordination mechanism for private sector to engage with government and partners on resilience building, response and recovery activities, (2) supports businesses, in strengthening their resilience by providing training, tools and guidelines; (3) integrates the private sector into national disaster management and resilience plans and processes, and (4) identifies and engages private sector capacities to respond to emergencies, pre-position agreements in preparation for emergencies and match capacities to humanitarian needs before, during and after emergencies.
798. Following TC Winston, the government of Fiji instituted an exemption of fiscal duty and excise duty in March 2016, leading to a fall in the revenue from these duties in that year. As shown in Table 26, this contributed to a fall in fiscal duty and total duty, despite a marginal increase in import VAT.
799. The relief and recovery phase after Cyclone Winston brought with it an influx of unrequested products. Many of these unsolicited goods hindered disaster relief efforts and ended up in landfills. According to newspaper reports, Fiji received the equivalent of 33 Olympic swimming pools of unsolicited goods in the aftermath of Cyclone Winston (The Guardian, 15 January 2017).

377 "Post- Disaster Needs Assessment PDNA: Lessons from a Decade of Experience 2018". Evaluation Report prepared by Terry Jeggle, lead writer, and Marco Bogger Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/Final_PDNA_Evaluation_Report.pdf.

378 Government of Fiji. Available at: <http://www.economy.gov.fj>.



Table 26: Import duty, fiscal duty and import VAT

Year	Value of Imports (FJD mil.)	Fiscal duty (FJD mil.)	Customs Import VAT (FJD mil.)	Total duty (FJD mil.)	Fiscal duty (% of imports)	Customs import VAT (% of imports)	Total duty (% of imports)
2010	3,464,614	252,417	328,534	580,951	7.3	9.5	16.8
2011	3,913,571	246,500	424,618	671,118	6.3	10.8	17.1
2012	4,030,678	258,632	436,824	695,456	6.4	10.8	17.3
2013	5,198,924	310,952	524,613	835,565	6	10.1	16.1
2014	5,012,583	365,083	560,155	925,238	7.3	11.2	18.5
2015	4,756,824	392,324	572,763	965,087	8.2	12	20.3
2016	4,839,186	397,641	444,333	841,974	8.2	9.2	17.4
2017	4,977,532	419,276	468,886	888,162	8.4	9.4	17.8

Source: WTO computation based on data from the Fiji Bureau of Statistics, 2018

Box 44: Fiji: Trade Facilitation Agreement Commitments

In May 2017, Fiji deposited its instrument of acceptance of the Trade Facilitation Agreement (TFA). It also notified to the WTO its commitments in Categories A, B, and C with indicative dates for implementation (for Categories B and C). In June 2018, Fiji notified to the WTO definitive implementation dates for its category B commitments. WTO analysis suggests that 62.6% of measures have been implemented with other measures requiring more time or technical assistance for implementation, 5.0 % in category B (more time) and 32.4% in category C (capacity building support). Indicative implementation dates for categories B and C stretch to 2021.

Fiji has requested assistance and support for capacity building for a total number of 10 TFA measures. These include: publication, information available through the internet, advance rulings, procedures for appeal or review, test procedures, risk management, average release times, authorized operators, formalities and single window.

Source: WTO Trade Facilitation Agreement Database <https://www.tfadatabase.org/uploads/notification/NFJI1.pdf>

800. Fiji is making important efforts to build resilience to climate change. As the first small states country presiding international talks on Climate Change (COP 23), Fiji has pledged to transition completely to renewable energy sources by 2030 and adopted a reforestation policy intended to store carbon from freshly planted trees. Fiji is also one of the three countries in the world that issued a sovereign green bond to finance projects that help build resilience to climate change. In addition, the “Build Back Safer” program was launched after Winston aiming to teach local residents how to rebuild homes more resilient to natural disasters. Future policies could include a careful consideration of infrastructure projects resilient to natural disasters and the exploration of ways to expand insurance to natural disasters.³⁷⁹

801. Fiji undertook recent commitments to reduce the vulnerability to natural disasters. Several policy actions were adopted, including the Fiji National

Adaptation Plan, Fiji Low Emission Development Strategy and the Planned Relocation Guidelines.³⁸⁰

802. In response to international commitments and national needs to build resilience of all Fijians, the Fijian Government developed Fiji’s National Adaptation Plan (NAP). The NAP’s goal is to achieve a climate-resilient development pathway, which enables Fiji to anticipate, reduce, and manage environmental and climate risks caused by climate variability. The NAP will be the main overarching process through which the Fijian Government addresses national adaptation needs. This will be achieved through building adaptive capacity and resilience, and integrating climate change adaptation, into policies, programmes, and processes across all relevant sectors and scales.

803. The Fijian Government submitted its Intended Nationally Determined Contributions in 2015, which was confirmed as its Nationally

379 Republic of Fiji, IMF Article IV public consultation, IMF Country Report No. 18/34, February 2018. Available at: <https://www.imf.org/en/News/Articles/2018/12/17/pr18479-imf-staff-completes-2018-article-iv-visit-to-fiji>.

380 Government of Fiji. Available at: <http://www.economy.gov.fj>.



Determined Contributions (NDC) upon ratification of the Paris Agreement in 2016. In 2017, the Fijian Government launched its NDC Implementation Roadmap focusing on emission reductions in the energy sector. In 2018, the Fijian Government launched Fiji's 2050 strategy known as the Low Emission Development Strategy (LEDS). LEDS has been adopted as Fiji's blueprint for a low carbon future. Fiji and the Marshall Islands have become the first two nations in the Pacific region to commit to raising the NDC by 2020 and to reach net zero emissions by mid-century.

804. The Planned Relocation Guidelines (PRG) has been developed to assist and direct relocation efforts at the local level. Through this, Fiji has become one of the first nation States to develop a national framework that guides the relocation process. The PRG ensures that the relocation of any local community is carried out in a manner that guarantees its long-term survival, has viable options for economic activity, and provides support and services for those being relocated. The PRG focuses to ensure that the relocation of any local community is carried out in a manner that guarantees its long-term survival, has viable options for economic activity, and provides support and services for those being relocated. The Guidelines also contain provisions to ensure the well-being and safeguard the rights of vulnerable members of any community being relocated.





Annexes



Annex 1: Hazards, Disasters and Measures Reported In Trade Policy Reviews (January 2010–September 2019)

TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2010	<p>Albania: Government procurement disaster provisions</p> <p>Armenia: Earthquake 1988, electricity generation shortfalls, closure of nuclear power plant</p> <p>Burkina Faso: Drought hazard and impact on economy and economic diversification</p> <p>China: Sichuan Earthquake (2008), reconstruction and import policy</p> <p>El Salvador: Torrential rain (2009) and redirection of fiscal spending</p> <p>Honduras – Tropical storms and “El Niño” impacts on agricultural production and pest status and price controls.</p> <p>Jamaica: Hurricanes Ivan (2004), Dennis (2005), Emily (2007) and Dean (2008) impacts on agricultural production and reduced exports.</p> <p>Papua New Guinea: Government procurement disaster provisions</p> <p>Sri Lanka: Tsunami (2004) tourism drop, reconstruction costs and procurement policy.</p>
2011	<p>Canada – disaster relief programmes in the agriculture sector</p> <p>Cambodia – Disaster provisions of government procurement and agriculture support</p> <p>Japan – Communicated an exception from its Anti-Monopoly Act of June 2010 in relation compulsory automobile and earthquake insurance</p> <p>Thailand – Impact of Great East Japan earthquake and tsunami in Japan</p>
2012	<p>Nepal: Agriculture production and food security, food import policy (drought)</p> <p>Philippines – Crop Insurance for disasters.</p> <p>China – agriculture support for disasters</p> <p>Togo – catastrophic floods (2008)</p> <p>The Republic of Korea – Protecting farm household income from natural disasters, aquaculture insurance for typhoon damage and import measures in response to Fukushima nuclear plant disaster.</p> <p>Bangladesh – Vulnerability to climate change, tropical cyclones and floods. Long term plan on flood management. Domestic food security policy for grains and complications of export restrictions taken by other Members in the response to Cyclone Sidre (2007).</p> <p>Kenya: Poor rainfalls and subsequent drought (2008), impact on hydro-electric power output, drought resistant agriculture measures.</p> <p>Tanzania: Inflation and high food prices from drought in the Eastern African region</p> <p>Uganda: Effect of weather and drought conditions on coffee, cotton and electricity production and impact of volcanic eruption in Iceland on exports.</p>
2013	<p>Indonesia: Continuing impact of 2004 earthquake and tsunami in Aceh and Nias</p> <p>Mexico: Micro-credit and insurance to protect agriculture, aquaculture and fishing from natural disasters</p> <p>Macao: Post-disaster support for fisheries, SME Aid Scheme for disasters</p> <p>Brazil: Government procurement disaster provisions, agriculture sector support for natural disasters</p> <p>Chad: Exemption of disaster aid from pre-shipment inspection</p> <p>Vietnam: Provision to reduce ad valorem duties on exported commodities in the event of natural disasters, natural disaster relief in the agriculture sector, support to fisheries sector to prevent natural disasters at sea.</p> <p>Peru: customs procedures for goods imported in cases of disaster or emergency, impact of natural disasters on transport system</p> <p>Kyrgyz Republic: VAT exemptions on imported materials used to assist after a natural disaster</p> <p>Japan: Impact of Great East Japan Earthquake discussed. Implementation of supplementary budgets amounting to about 3.6% of GDP to finance reconstruction following the earthquake and tsunami that affected the country's east coast in 2011. Reconstruction was financed through a combination of reduced government expenditures, non-tax revenues, and temporary tax measures. In addition, the government formulated a largescale recovery programme including extensive support for the relief and reconstruction.</p>
2014	<p>Tonga: Tongan agriculture is prone to natural disasters, particularly cyclones and occasional droughts</p> <p>Myanmar: Public stockholding for food security for rice and food aid for regions affected by natural disasters</p> <p>Ghana: Compulsory commercial buildings insurance against risk of natural disasters. introduction of agricultural weather-index insurance product on a pilot basis by MOFA in partnership with Ghana's meteorological services, modernization of agricultural sector to address flooding and drought risk.</p> <p>Antigua and Barbuda: Risks from natural disasters such as hurricanes. Enactment of food security law and import substitution, and implement the land-use policy more aggressively.</p> <p>Dominica: Natural disaster hazards: (hurricanes, storms, landslides, volcanic activity). Hurricane Dean (2007), Hurricane Omar (2008), drought (2010), major flooding (2011). Damage to infrastructure, disease impact on banana production, monetary policy and debt financing.</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2014 cont.	<p>Grenada: Risk of natural disaster acting as brake on investment. Hurricanes Ivan (2004) and Emily (2005) and wilt disease impacted the nutmeg sector and banana production. Nutmeg exports collapsed.</p> <p>Saint Kitts and Nevis: Hurricane damage which resulted in the closure of a major resort hotel in Nevis.</p> <p>Saint Lucia: Adverse effects of natural disasters, plant pests, and rising input prices. Common External Tariff exemptions for disaster relief. Hurricane Thomas damage on agriculture sector.</p> <p>Saint Vincent and the Grenadines: Adverse impact of several natural disasters reported.</p> <p>China: Preferential tax policies for disaster relief grain</p> <p>Panama: Requirements on insurance companies to set aside reserves to cover disaster risk and agricultural support measures for natural disaster</p> <p>Djibouti: Regional drought (2008) reducing the food supply, losses of crops and cattle, establishment of Djiboutian Food Security Company (2009).</p> <p>Hong Kong, China: Loans on concessional terms and emergency relief from natural disasters for farmers.</p>
2015	<p>Barbados: Vulnerability to natural disasters reported.</p> <p>Pakistan: Difficult economic environment worsened by a host of natural disasters. Challenging crop production situation due to irregular rainfall and natural disasters such as 2010 flooding.</p> <p>Australia: Plant Breeder's Rights registrations dropped due to the long-term consequences of drought and natural disasters affecting both domestic and non-resident applicants.</p> <p>India: Agricultural support providing relief to the farmers from crop failure due to natural disasters, pests and diseases.</p> <p>Canada: Business Risk Management programmes benefitting farmers to cope with including natural disasters. Agrinsurance and Agrirecovery programmes for natural disasters.</p> <p>Chile: Chile implemented programmes for supporting the victims of natural disasters, supporting fishing industry workers, and promoting the use of insurance and non-conventional renewable energies. Agriculture performance erratic due to sector's growth has been erratic due to the global financial crisis, climate problems and the earthquake of 2010. Mandatory insurance for fire, earthquake and flooding.</p> <p>New Zealand: Agriculture domestic support is limited to biosecurity border control for pest and disease and relief against climate disaster.</p> <p>European Union: Changes to EU state aid rules to exempt certain categories of horizontal State aid from prior notification, including for natural disasters (Council Regulation (EU) No. 733/2013) and Commission Regulation (EU) No. 702/2014 declaring certain categories of aid in the agricultural and forestry sectors compatible with the internal market, including repairing damage from natural disasters, and Commission Regulation (EU) No. 1388/2014 declaring certain categories of aid to fishery and aquaculture products compatible with the internal market, including aid to SMEs to make good the damage caused by natural disasters).</p> <p>Angola: Impact of drought on agricultural sector performance.</p> <p>Cabo Verde: Volcanic eruptions on Fogo Island. VAT rate was increased from 15% to 15.5% as an extraordinary and temporary measure applied to all goods and services, except water and electricity.</p> <p>Botswana: Goods imported for a specific purpose or under different customs regimes may also be exempt from VAT, including goods imported, for the relief of distress in cases of famine or other natural disaster.</p> <p>Japan: Japan did not take measures to revise upwards its tariff rates despite there being «water» between applied and bound rates. Following the 2011 Great East Japan Earthquake, a variety of measures were introduced in severely damaged areas to encourage reconstruction which included tax credits of 10% of salaries plus employee expenses, special capital allowances or tax credits on acquired assets, and a five-year exemption from corporation tax for new enterprises. Several other programmes supported small and medium enterprises. These programmes were expanded in FY2013 to include, inter alia, projects to support manufacturing (FY2013 budget of ¥11.9 billion), and support for business creation (¥4.8 billion), in addition to existing programmes which included direct support for financing (¥26.5 billion). However, most support in FY2013 was focused on reconstruction after the Great East Japan Earthquake. In addition to direct support, SMEs also qualify for loans from public financial institutions and loan guarantees: at end FY2012, out of a total value of outstanding loans of ¥240 trillion, 9.5% was from public financial institutions and another 13.6% was guaranteed. A Fisheries Recovery Master Plan was also implemented as part of the recovery efforts. The Great East Japan Earthquake and Tsunami caused extensive damage to the fishery sector in Japan causing an estimated ¥1.25 trillion in damage to 28,612 vessels, and 319 ports, and including ¥133.5 billion in damage to aquaculture facilities and products. Under the Fisheries Recovery Master Plan, the objective is to complete the recovery of fishing port facilities by end-FY2015.</p> <p>United States: Rebuilding activities post Hurricane Sandy are likely to support subsequent local economic recovery. Drought in the Midwest was estimated to have lowered real GDP growth in the second and third quarters of 2012</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2015 cont.	<p>Namibia: Given its arid climate, Namibia's agricultural output is highly vulnerable to climatic factors. The livestock sector and crop production suffered due to a protracted drought in 2013. Food reserve stocks were almost exhausted but have since been rebuilt. Government has constructed silos with a total storage capacity of 18,900 MT of food reserves comprising maize, sorghum and wheat. The Government plans to have food reserves with a capacity of 68,000 MT, equivalent to four months of emergency food relief. Namibia continues to import more than 50% of the cereals and horticultural products consumed locally. The National Drought Policy and Strategy of 1997 provided financial assistance to farmers who marketed their livestock to cushion low prices at the abattoirs and to prevent livestock mortality due to drought.</p> <p>South Africa: The Customs and Excise Act regulate rebates on any customs duties, the fuel levy and the road accident fund levy on specific goods imported for relief in cases of natural disasters and famines.</p> <p>Swaziland: Export prohibitions may be imposed in case of food shortages resulting from drought or other natural disasters, but the authorities have indicated that they are not applied in practice.</p> <p>Jordan: Temporary government control of prices in the case of emergencies or natural disasters provided for under the Competition Law</p>
2016	<p>Thailand: Large negative supply shocks, in particular, devastating floods in 2011 and the impact of Japan's Tohoku earthquake/tsunami disaster on Thailand's car industry supplies. Insurance programme for seasonal rice was introduced to insure against natural disasters. Government assistance to the fisheries sector includes disaster relief payments National Forestry Policy includes provisions to prevent natural disasters.</p> <p>Haiti: Slow recovery after devastating 2010 earthquake. Deterioration of economic conditions because of political instability and devastating natural disasters. The earthquake destroyed the equivalent of 120% of GDP. It brought the entire economy to a halt and aggravated poverty and vulnerability among the Haitian population at large. Economic output shrank by 5.5% during fiscal 2010. This disaster hit just as prospects were improving after years of prudent macroeconomic management.</p> <p>Georgia: Tariff exemptions and reductions for imports of goods for response to natural disaster and for humanitarian assistance. The Patent Law contains limitations on the exclusive rights of a patent holder to ensure the fair use of patents: according to Article 52, the use of invention in the case of natural disaster, catastrophe, epidemic or other emergency situations is not considered as a violation of exclusive rights.</p> <p>Morocco: The Moroccan Export Insurance Company provides insurance at subsidized rates against political risks, disasters and non-transfer, for companies which export capital goods, carry out public works, or supply services lasting over one year. Ability to establish price controls for large scale disasters after consultation with Competition Council.</p> <p>Fiji: Frequency of natural disasters constrains its economic growth prospects. Natural disasters caused disruption to tourism sector, but overall tourism numbers continued to grow boosted in part by more frequent air services and investments</p> <p>Turkey: Universal service obligations in the telecoms sector includes provisions to provide relief work and the supply of communication in case of natural disasters. Import measures to test for radionuclides and a certificate of radiation issued by the Turkish Atomic Energy Authority required for Japanese imports after Fukushima nuclear disaster.</p> <p>Maldives: Direct payments to compensate for loss of income due to natural disasters; were replaced by insurance scheme from 2014, as well as concessional loans to support agricultural development. Vulnerability to climate change and high cost of natural disasters. The President may waive duties on goods imported under special circumstances such as an epidemic, a natural disaster, gifts, or free aid.</p> <p>Ukraine: Compulsory insurance requirements for agricultural enterprises to and lines and equipment transmitters of electricity from natural disasters.</p> <p>Malawi: The Public Finance Management Act empowers the Ministry of Finance, Economic Planning and Development to grant concessions, including tariff rebates, on goods deemed to be of public interest in exceptional circumstances, such as natural disasters. Strong reliance on a few agricultural commodities renders Malawi particularly vulnerable to external shocks such as volatile export prices and drought. Fall in food production in 2015 caused by drought and floods causing a sharp deterioration in food security conditions.</p> <p>Honduras: Growth of the Honduran economy has been ponderous and unstable in recent years, largely owing to the effects of natural disasters (flooding). GDP growth slowed because of a fall in goods and services exports and the substantial cutback in public investment. The Directorate-General of Consumer Protection is empowered to fix prices or the maximum retail margin for goods and services in the basic shopping basket and agricultural and industrial inputs required for economic activities in times of emergency, disasters or catastrophes.</p> <p>Albania: Exceptions to public procurement in case of natural disasters.</p> <p>Zambia: Priority sectors are poised to mainstream cross-cutting issues including disaster risk management into their key output indicators. (WT/TPR/S/340)</p> <p>Tunisia: The Foreign Trade Insurance Company covers non-payment by the foreign buyer as a result of natural disaster. Measures to improve the penetration rate for insurance services include: development of agricultural insurance by reactivating the agricultural disaster fund and establishing an index-based insurance system and establishing a mechanism to cover natural disaster risk. The National Guarantee Fund grants loans to SMEs and farmers to cover drought risk.</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2016 cont.	<p>El Salvador: El Niño phenomenon led to serious droughts during the 2014 and 2015 planting seasons. Red bean exports were restricted for price stability and to ensure an adequate domestic market supply. "Scarcity quotas" were opened for imports of red beans and maize as temporary measures to alleviating shortages. Agricultural policy measures included measures for price stability, packages of seed and fertilizer for farmers and design of the "National staple grains supply and marketing policy". El Salvador participates in disaster risk reduction activities as a member of the Association of Caribbean States. Exceptions to public procurement in case of natural disasters.</p> <p>Russian Federation: Ministry of Agriculture provided compensation to agricultural producers for damage resulting from natural disasters in 14 regions causing 2.02 million hectares in crop losses. Federal and regional authorities provided Rub 4,676.6 million, in addition to Rub 2,597.1 million for natural disasters in 2014.</p> <p>United States: Temporary waiver to the Jones Act granted in the wake of Hurricane Sandy.</p> <p>Republic of Korea: 24% of green box measures used for relief from natural disasters and 2.4% for public stockholding for rice for food security purposes to deal with emergency situations such as grain shortages and natural disasters. Import restrictions on 27 agricultural products from 13 prefectures in Japan following the Fukushima disaster and start of a dispute settlement case in 2015 challenging these measures was noted.</p> <p>Democratic Republic of the Congo: Concessions granted under the Agricultural Code for the purpose of rehabilitating arable land and preventing agricultural disasters noted.</p> <p>Sri Lanka: Indian Ocean Rim Association created in 1997 to enhance economic cooperation including disaster risk management.</p> <p>Guatemala: Payments for relief from natural disasters in response to Tropical Storm Agatha included food aid and support to agriculture and livestock sector.</p> <p>Solomon Islands: Heavily exposed to natural disasters and external shocks. Country is susceptible to both hydro-meteorological (tropical cyclones, floods and droughts) and geophysical disasters (earthquakes, and resulting tsunamis and landslides). Solomon Islands was hit by several tropical cyclones during the review period. In February 2013, a magnitude 8.0 earthquake and a subsequent tsunami affected the Santa Cruz Islands. In April 2014, heavy rains brought by a tropical cyclone caused destructive flooding in some major cities, resulting in damages and loss estimated at USD 107.8 million (9.2% of GDP). In 2015, natural disasters (the El Niño phenomenon and the Tropical Cyclone Raquel) severely impacted fish catch and agricultural production.</p> <p>Mexico: TPR noted agricultural support and insurance schemes for natural disasters under the PROAGRO and AGROASEMEX programmes.</p> <p>Belize: Tropical storms cause wind and flood damage to agriculture sector that contribute 10% of GDP and 40% of total merchandise exports., the Government also applies price controls on some basic commodities. Economy is vulnerable to internal and external shocks, including natural hazards – such as hurricanes, tropical storms and flooding due to its extensive coastline and the exposed position of its major city.</p> <p>Mozambique: Prone to natural disasters and third amongst African countries most affected by weather hazards. Drought caused a 0.8% drop in GDP growth in 2015.</p>
2017	<p>Brazil: Agricultural insurance support compensate farmers for production losses due to natural disasters, with programmes targeting commercial farmers and family farms. Drought in Northeast region prompted rescheduling of farmer debt. Drought also impacted electricity generation where hydroelectric sources of power accounts for 64% of installed capacity. Drought caused drop in hydropower generation had to be compensated by output of thermal power plants, which also increased the cost of energy.</p> <p>Jamaica: Agriculture represents about 7% of GDP and employs about 18% of the total workforce, but its development has been constrained by an inadequate infrastructure and natural disasters. Drought, as well as the lingering effects of hurricane Sandy in 2012, led to reductions in the sector's production and export earnings. Due to more favourable weather conditions, the sector experienced strong growth in 2016, when it expanded by 13.5% after declining in the 2013-15 period.</p> <p>Paraguay: Government procurement exceptions include natural disaster; Real GDP grew at an average annual rate of 4.7% between 2011 and 2016. In 2012, a severe drought and the continuing global crisis caused GDP to shrink by 1.2%. It then soared by 14% in 2013, boosted by a sharp upswing in agricultural production.</p> <p>Burkina Faso: Agricultural production is regularly exposed to natural disasters, in particular, locust invasions, floods and droughts. One priority area of the Country Programming Framework 2014-2017 is resilience and nutrition of the population with regard to stresses, climate changes, food crises and natural disasters.</p> <p>Mali: Drought, a series of socio-political disturbances and a deteriorating security situation in the north of the country, hindered economic activity reducing the 2010 GDP growth rate of 5.4% in 2010, down to 3.2% in 2011. In 2012, the Malian economy contracted by 0.8%.</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2018	<p>Niger: Drought and locust invasions continue to cause serious and recurrent problems. Most of the population live in rural areas and engage in subsistence farming – mainly millet, sorghum, rice and groundnut cropping, and livestock activities. The National Food Crisis Prevention and Management Framework comprises an early warning system, a national security reserve and a Food Security Investment Fund, a component of the “Niger Feeds Niger” Initiative launched in 2011. The EWS is part of a regional environment for information exchange maintained by the Inter-State Committee on Drought Control in the Sahel.</p> <p>Senegal: Economic growth fell in 2011 due to drought, rising food and energy prices. GDP returned in 2011 due to robust agricultural recovery.</p> <p>Bolivia: Legislation also allows the State to subsidize agricultural production in the event of, price surges, natural disasters, insecurity and shortages of food or hydrocarbons. The “Pachamama” Universal Agricultural Insurance Scheme may cover losses from climatic and natural events, pests and diseases. Specific government procurement procedures apply in the event of disaster and/or emergency situations.</p> <p>Cambodia: Government procurement rules allow exceptions for natural disasters. Agricultural support mechanisms include provision for relief from natural disaster. The Cambodia Food Reserve System was established in 2012 as a public food and vegetable seed stock and covers the immediate food needs of 10% of the population in disasters and emergency situations. The National Committee for Disaster Management is participating in the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management.</p> <p>Japan: Funds allocated to, inter alia, reconstruction from the 2016 Kumamoto and 2011 Great East Japan earthquakes</p> <p>The Gambia: Situated in the Sahel belt, agriculture is vulnerable to natural disasters (drought) and the country faces chronic food deficits. About half of the Gambian population relies on subsistence farming and a few cash crops (mainly groundnuts) for their livelihood. The country is a net food importer by a wide margin, being vulnerable to drought and other natural disasters.</p> <p>Egypt: The General Authority for Improving Land Support to Farmers and Young Graduates plays an important operational role in the support of farmers including helping farmers face natural disasters such as floods.</p> <p>The Philippines: Maintains international reserves (USD 80.7 billion in 2016) equivalent to almost nine months of imports to cover vulnerability to natural disasters and capital flow volatility. The Philippine Crop Insurance Corporation under the Department of Agriculture implementing insurance programmes that cover losses arising from natural disasters. The government expenditures were accordingly notified as Green Box “payments for relief from natural disasters”.</p> <p>Mauritania: Government procurement provides for simplified procedures when responding to natural disasters. The EMEL Programme was introduced in 2011 following a severe drought with products sold imported by National Import-Export Company. In, 2018 the activity of the Emel shops dwindled following the liquidation of SONIMEX. Gum arabic production collapsed following droughts in the 1970s and 80s. The World Bank is working with the country to promote this crop as part of the Sahel and West Africa Programme implemented jointly by the World Bank and the Global Environment Facility to support the “Great Green Wall” initiative.</p> <p>Chinese Taipei: Amendments were made to the Regulations for the Relief of Damage Caused by Natural Disasters in the wake of 2015 typhoons. Certain crops and fisheries items were made eligible to receive low interest rate loans. Additionally, changes were made to expand eligibility for post-disaster cash relief as well as to increase the value of such relief. Total relief allocations amounted to NT\$3.6 billion, benefitting 139,400 households, and 353 farm or fishing households received low-interest loans totalling NT\$26 million. In 2015, a new programme for natural disaster insurance for agricultural crops was initiated.</p> <p>Vanuatu: Cyclone Pam hit in March 2015 causing widespread devastation and extensive damage. An estimated 65,000 people – about a quarter of Vanuatu’s total population – were displaced. The total economic damage was equivalent to about 64% of GDP. The most affected sectors were agriculture and tourism, which contracted by 15.8% and 9.7% respectively. Merchandise exports and income from tourism declined substantially, while imports surged due to reconstruction needs. Government’s responses included: support for household reconstruction by temporarily suspending VAT and import duties on construction materials; Entry issues for humanitarian goods and services fall within the ambit of measures regularly discussed at the WTO. Onerous inspection and documentation requirements may delay the entry of relief items. Specialized personnel can face regulatory barriers due to issues related to the recognition of their qualifications and licensing or permit requirements. According to the IMF, the outlook for Vanuatu’s economy is that it will fully recover from the effects of Cyclone Pam in the near future, with an estimated real GDP growth rate of 4% in both 2017 and 2018. The current account deficit is expected to widen to around 9% of GDP in 2017 and 2018, due to the high import content of the projects to scale up infrastructure. The fiscal deficit is expected to remain high, at around 7-8% of GDP, also reflecting reconstruction and infrastructure expenditure. The possibility of further natural disasters remains an important downside risk to all projections. (The experience of Vanuatu is covered in detail in Section II).</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2018 cont.	<p>Armenia: Tariff concessions stated in the Treaty of the Eurasian Economic Union, in international agreements between the EAEU and third parties, permit exemptions from customs duties of goods imported to alleviate the effects of natural disasters, accidents and disasters within the framework of humanitarian assistance; and goods imported for charity purposes by third countries, international organizations, or governments in accordance with the legislation of the member States. .</p> <p>Hong Kong, China: Agricultural policy provides emergency relief in times of natural disasters.</p> <p>Nepal: Due to its diverse topography, Nepal faces many challenges as a landlocked LDC with poor infrastructure, small scale farming, low productivity, and a high risk of natural disasters – the earthquakes of 25 April and 12 May 2015 were estimated to have caused NR 28.3 billion in damages and losses to agriculture. (The experience of Nepal is covered in detail in Section II).</p> <p>United States: Waiver of the Jones Act are granted by the Secretary of Homeland Security only “in the interest of national defense” granted in the wake of Hurricane Sandy.</p>
2019 (until end September)	<p>Ecuador: Imports exempted from foreign trade levies include emergency aid shipments for natural disasters or similar disasters. Law on the Promotion of Production, Attraction of Investment and Generation of Employment, and Fiscal Stability and Balance provides for extension of the time-period for making new productive investments in the areas affected by the April 2016 earthquake from 3 to 5 years and up to 15-years’ income tax exemption. The tourism sector is eligible for an additional 5 years. Ecuador made various changes to the list of goods covered by the balance of payments safeguard introduced in 2015 and related tariff rates. It extended the period of application following the April 2016 earthquake and established a progressive timetable for its dismantlement beginning in 2016 and it was eliminated on 1 June 2017. The earthquake’s impact on GDP was estimated at 0.7%, in addition to the loss of productive assets worth 0.26% of GDP.</p> <p>Kenya: In 2017, inflationary pressures re-emerged because of drought. Despite the Government’s food subsidy programmes, inflation reached 8%. The consumer price index inflation rate almost hit double-digit levels in 2011 and 2012, under the pressure of high food and energy prices. Strategic reserves stockholding is part of Kenya’s strategy for food security. Since 2015, the National Cereals and Produce Board (NCPB) has been responsible for maintaining a strategic reserve of maize grains, pulses, rice, powdered milk or cash equivalent.</p> <p>Uganda: Economic growth slowed to an annual rate of 2.6% in 2016, due to drought that adversely affected agricultural production and agro-processing; the spillover from regional conflict also had a negative impact on growth. With weather conditions improving, the GDP annual growth rate bounced back to 5.1% in 2017.</p> <p>Bangladesh: Since 2011/12, real GDP has grown at an average annual rate of approximately 6.8% and reached 7.9% in 2017/18. Growth has been driven by the ready-made garment (RMG) sector exports. In 2017, net exports turned negative, with higher imports resulting from demand for investment goods and food imports, due to natural disasters. Upgrading infrastructure remains critical for improving international competitiveness. The 7th Five Year Plan 2016–20 set objectives to enhance and strengthen the operational facilities of existing airports and the development of new ones. Objectives include: the improvement of the quick communication system between the rivers and the coastal belt of the southern zone of the country and the capital city, especially in times of natural disaster.</p> <p>Samoa: The country faces challenges from recurrent natural disasters. Samoa’s debt management strategy is anchored in a target ratio of 50% of GDP. The 2009 tsunami and Cyclone Evan increased the debt level by 10% and 5% of GDP, respectively. During most years of the review period, the debt ratio remained over the target level. According to the IMF, Samoa is assessed to be at high risk of debt distress in the medium term given the risk of natural disasters.</p> <p>In December 2012, Cyclone Evan caused damage and losses estimated at USD 203.9 million for physical assets, production losses and higher production costs caused. Real GDP fell by 1.9% over the fiscal year 2012/2013, reflecting, inter alia, the decline of value-added in the services sector, mainly in tourism (hotels and restaurants, and transport). Fishing and agri-food industries also suffered. The authorities responded with a fiscal stimulus and Central Bank lending to non-bank financial institutions.</p> <p>Samoa cont. The Ministry of Agriculture and Fisheries provided disaster relief to farmers under the Agriculture and Fishing Cyclone Recovery Programme, funded by the World Bank. This Programme provided electronic vouchers to affected farmers, to enable them to purchase farm equipment and household tools. Government support to agriculture sector has been mainly in the form of Green Box general services and input subsidies to subsistence farmers and in response to natural disasters.</p> <p>With regard to banking services, while commercial banks are well capitalized, natural disasters continue to pose a risk. Given the vulnerabilities the country faces, the fiscal framework is aimed at ensuring resilience to natural disasters.</p> <p>Papua New Guinea: The country has several active volcanoes, and is subject to frequent earthquakes, including a large one in February 2018 that killed nearly 200 people, damaged infrastructure, and disrupted oil, gas, and minerals exports. Real GDP growth peaked at 15.4% in 2014, but decelerated to an estimated zero in 2018 due to low commodity prices, a major drought in 2017 and the February 2018 earthquake which also weakened PNG’s external position and created fiscal challenges. Agriculture and related activities account for 18% of PNG’s GDP. Agriculture exports (e.g. palm oil, coffee, cocoa) due to a major drought in 2016–17, and because of low productivity. Development progress has been made as reflected in an increase in GDP per capita, from USD 1,672 in 2009 to USD 2,556 in 2017. However, some 3 million people, about 40% of the population, live below the basic needs’ poverty line and part of the population considered vulnerable may have fallen back into poverty in the aftermath of the catastrophic earthquake of 2018.</p>



TPR year	Member Reviewed and Hazard, Disaster or Policy cited
2019 (until end September) cont.	<p>Canada: Growing Forward 2 Framework Agreement includes programmes to assist farmers in coping with market volatility and disaster situations (business risk management – BRM). AgriInsurance makes available subsidized insurance, providing coverage for production losses due to natural disasters (weather-related, pests or disease). The programme covers traditional crops such as wheat, maize, oats, barley and horticultural crops, and may be delivered on a yield or non-yield basis. AgriRecovery is a programme for abnormal events resulting in extraordinary costs that require assistance beyond the scope of the core BRM programmes. It provides a disaster relief framework to aid the return to normal conditions. Under this framework, the federal and provincial governments join in efforts to complement the core BRM programmes, for example to cover extraordinary costs related to disease, pest infestations, extreme weather, or contamination of the natural environment. One joint effort – the Canadian-British Columbia Wildfires Recovery Initiative – was activated under the AgriRecovery framework in 2018.</p> <p>The Republic of North Macedonia: The Customs Administration may provide partial or full exemption from import duties on foreign goods for temporary admission into the customs area. The temporary procedure is generally restricted to a maximum of 24 months (with a possible extension) and the goods must be intended for re-export without being modified. Categories of goods eligible include disaster relief materials.</p> <p>Costa Rica: Negative impact of drought on hydro-electric power generation meant that the thermal power plants had to be used to produce the electricity required. (2014)</p>



Annex 2: Trade Impacts Reported in Selected Post-Disaster Needs Assessments

Table 27: Macroeconomic impacts reported in Post-Disaster Needs Assessments

PDNA	Impact on GDP growth	Exports	Imports	Balance of payments (BOPs) effects
Samoa Earthquake and Tsunami 2009	3 – 5 % decline relative to the pre-tsunami baseline was projected.	Exports were projected to decline by 2.5% in 2009/10 and 0.3% in 2010/11.	Imports were projected to increase by 1.10% in 2009/10 and then decrease by 4.6% in 2010/11.	BOPs deteriorate due to the impacts on the tourism sector, which accounts for 65% of all export earnings.
Haiti Earthquake 2010	An 8.5% fall in the GDP growth rate in 2010.	Exports were estimated to fall from 14.6% to 11.6% of GDP.	Imports were estimated to increase from 44.1% to 57.5%.	BOPs were estimated to become negative.
Laos, Typhoon Haima, 2011	Moderate impact at national level (0.16%)	Loss in exports of 0.5%.	Imports increase by 0.5% in 2011.	The impact of the typhoon on BOPs is minimal.
Thailand, Flood, 2011	The floods were estimated to reduce real GDP growth in 2011 by 1.1% from pre-flood projections.	Export was estimated to decline by USD 7.9 billion in 2011 and 1.9 billion in 2012	Import was estimated to increase by USD 7.5 billion in 2012 due to the increased demand for reconstruction.	The floods will negatively affect the current account in 2011 and 2012.
Samoa Cyclone Evan 2012	0.2% fall in GDP growth rate in 2012. Zero or negative growth rate in 2013.	Exports, mainly related to the tourism sector, were expected to decline.	Imports of construction materials and fuel expected to increase.	BOPs rise by minus 1% of GDP in 2013 and 2014.
Fiji Cyclone Evan 2012	A decline by 0.1% to the existing GDP forecast	Exports of agricultural products (fruit, vegetable, coconut oil) expected to fall	Import of construction materials food, medicines, and essential goods expected to increase.	Current Account deficit for 2012 is estimated to worsen by 21.2%
Seychelles, Floods, 2013	Real GDP growth projected to grow by up to 3 %.	Tourism exports were not affected.	Construction materials needed to be imported.	Not mentioned in the report
Saint Vincent and the Grenadines, Floods 2013	The flood event resulted in total damages and losses of USD 103.9 million, equivalent to 15% of GDP.	Imports of foods, agricultural supplies, water and sanitation supplies, construction materials expected to increase	The export of agricultural goods was estimated to decline.	BOPs were estimated to deteriorate due to increased imports.
Solomon Island, Floods, 2014	Growth to slow from projected 4.0 % to 0.1 % in 2014.	Exports of the crop such as cocoa, copra, palm oil declined.	Not mentioned much in report	2.6% increase in current account deficit in 2014 expected.
Nepal Earthquake, 2015	Drop in GDP growth rate by 1.5% relative to the projected rate of 4.0%.	Export was estimated to decline by 6%	Imports are expected to grow by about 18% in FY 2015–2016.	BOP surplus due increased inflow of remittances and foreign assistance grants.
Vanuatu Cyclone Pam, 2015	GDP growth predicted to fall 5.5% relative to the pre-cyclone forecast. GDP growth of 1.4% predicted in 2015.	Tourism earnings were expected to decline drastically.	Import of construction materials was expected to increase.	BOPs were expected to be affected by exports declining relative to pre-cyclone levels.

PDNA	Impact on GDP growth	Exports	Imports	Balance of payments (BOPs) effects
Fiji, Cyclone Winston, 2016	Drop of 1.4 % relative to the pre-cyclone forecast.	Total exports were estimated to decline by 1.2 percent due to drop in exports (sugar, dalo, coconut oil, and yagona)	Imports of construction materials, equipment, food and machinery were expected to increase	BOPs Current Account deficit estimated to increase by 8.9%.
PDNA	Impact on GDP growth	Exports	Imports	Balance of payments (BOPs) effects
Saint Vincent and the Grenadines, Floods 2016	Total damage and losses were equivalent to 5% of GDP.	Not mentioned much in the report.	Imports of food, agriculture supplies, construction materials expected to increase.	Increased imports were expected to worsen the BOPs.
Dominica, Hurricane Maria, 2017	Projected real GDP growth projection for 2018 was -15.5 %.	Exports of goods and services were estimated to decline to around 50% of pre-storm levels	Imports of goods and services were expected to grow 9%.	Imports of construction materials were expected to impact the national BOPs.
Tonga Cyclone Gita, 2018	GDP growth was projected to slow to around 0.3% from projected 3%.	Exports were estimated to decline due to damage to the agriculture sector.	Imports were projected to increase significantly.	BOPs expected to pressure since imports arose, export declined, and foreign exchange reserves declined.

Source: Post Disaster Needs Assessments.



Table 28: Loss and damage reported by sector

PDNA	Agriculture	Fisheries	Forestry	Commerce and Manufacturing	Tourism
Samoa Earthquake and tsunami 2009	53% of the population works in the agriculture sector. The estimated losses to agriculture are SAT\$8 million and to livestock SAT\$1.4 million.	Damages in the sector adversely affected the economic and health status of people.	Damages and losses in the sector were not reported in the PDNA.	The sector was estimated to decline by 1.6 percent in 2008/09 driven by falls in the construction sector and falling consumption.	20% of the total accommodation rooms were totally or partially destroyed.
Haiti Earthquake 2010	Debris and landslides damaged irrigation systems for over 3,500 ha of farmland.	Fishing catches were reduced.	Not reported in the PDNA report.	The sector severely was impacted by structural damages and human life loss.	Tourism sector accounts for small parts of GDP in Haiti
Laos, Typhoon Haima, 2011	Crops are worst affected by the floods induced by Typhoon Haima.	The damage to the fishery sector remains limited compared to that incurred by crops.	DRR initiatives were recommended for the departments of forestry.	Industry, consisting mainly of SMEs, was affected to a lesser extent.	Trade and tourism activities were affected due to road damage and floods at some touristic sites.
Thailand, Flood, 2011	Crops were worst affected by the floods.	Floods caused damage to fish hatcheries.	Not explicitly reported in the PDNA report as a (sub)sector.	The manufacturing sector accounted for about 70 % of the total damage and losses.	The tourism sector was one of 4 most worst affected sectors.
Samoa Cyclone Evan 2012	Crop losses were substantially high because the cyclone hit the country during the peak season.	Boats, canoes, and fishing gear were destroyed.		Production losses will spill over into 2013 for the manufacturing sector and into 2014 for the commerce sector.	Economic losses will have a negative impact at the macroeconomic level.
PDNA	Agriculture	Fisheries	Forestry	Commerce and Manufacturing	Tourism
Fiji Cyclone Evan 2012	Permanent crops were the most affected in the sector.	No damages and losses in the sector were reported for the PDNA.	The majority of the damages was to buildings, sheds and seedling nurseries.	Most commercial owners restored their activities from a day to two weeks after the disaster.	Structural damages were minimized due to the high building standards. Insurance is a key.
Seychelles, Floods, 2013	The floods caused considerable damage to the sector.	Not explicitly reported in the PDNA report.	Not explicitly reported in the PDNA report.	Except for Agro Industries, no main industry was affected.	Few significant hotels were located in the flooded area. No damage and loss data were collected.
Saint Vincent and the Grenadines, Floods in 2013	The sector was impacted by the flooding, mainly due to the interruption of transport.	The sector was jointly reported in the agriculture sector.	The sector was not reported in the PDNA.	Only minor damage was reported.	The significant losses were due to the limited access to crucial tourism sites due to damages to the transportation infrastructure.

PDNA	Agriculture	Fisheries	Forestry	Commerce and Manufacturing	Tourism
Solomon Island, Flash Floods, 2014	Damage and losses of crops were more substantial than fishery (4.4 times more) and livestock (8.8 times more)	Damage and losses were from loss of fishing equipment, canoes, and boats, along with reduced access to fishing grounds due to debris and sedimentation.	Not explicitly reported in the assessment.	The commerce sector accounted for 10% of total damage and losses (USD 10.7 million)	Not reported in the assessment.
Fiji, Cyclone Winston 20 February 2016	The highest level of production losses was expected in the agriculture sector, accounting for 65% of total losses.	Artisanal fisheries and commercial aquaculture were the most affected in the sector.	The timber industry was affected by high winds, which caused damage to infrastructure and trees.	Major damage and losses were incurred in Western Division, attributed mainly to sugar manufacturing.	Impacts on the sector were minimal.
Nepal Earthquake 25 April 2015	The sector is dominated by women. Production losses occurred both in crop and livestock subsectors.	Production losses occurred due to damages and losses in fish ponds and raceways.	Large areas of forests were destroyed, reducing the benefits of the ecosystem services from forests.	Most large manufacturing industries were not directly affected, but affected by falling demands and fleeing workers.	Tourists arrivals were expected to reduce by about 40% in 2015.
Vanuatu Cyclone Pam	Permanent crops were the most impacted in the sector.	Artisanal fisheries and commercial aquaculture were the most affected in the sector.	Damage to infrastructure and trees impacted the timber industry.	The sector comprises about 40% of GDP. The total damage and losses were estimated at VT 1.2 billion and VT 2.2 billion respectively.	The tropical cyclone severely affected the sector, with the estimated damage of around VT 5.9 billion and estimated losses of VT 3.6 billion.
Saint Vincent and the Grenadines, Floods in 2016	Damage in the sector was mainly due to direct crop damage and loss of agricultural land from flooding and landslide.	Damage to graveyards impacted seasonal fishing.	Damage and losses in the forestry sector were estimated at USD 333,333.	Major economic and commercial activities were closed for three days.	No significant damage and losses were incurred.
Dominica, Hurricane Maria, 2017	Damage and losses in the sector were related to all aspects of agricultural production including crops, infrastructure, equipment, and croplands.	Damage to the sector includes damage to vessels, fisheries building, and cooperatives.	High winds and intense rainfall caused widespread damage to the forest system, resulting in total damage and losses of USD about 30 million.	Damage and losses were associated with loss of infrastructure, supplies and lost trade opportunity due to lack of supply and changes in demands.	39% of hotel room stock was severely damaged.
Tonga Cyclone Gita, 2018	The most extensive level of economic loss was expected in the agriculture sector, representing 63% of the total losses.	Artisanal fisheries and commercial snapper fishing boats were most affected.	The timber industry was affected by high winds which destroyed infrastructure and trees.	3 % of business in the affected areas reported complete destruction of their properties, while 60 % reported partial damage.	Damage and loss to the tourism sector totalled T \$40.6 million.

Source: Post Disaster Needs Assessments.



Table 29: Loss and damage reported to infrastructure

PDNA	Airports and ports	Electricity	Communications	Transport	Water and sanitation
Samoa Earthquake and tsunami 2009	Damage and losses were incurred to air transport; a wharf was severely damaged.	The impacts of the tsunami on the electricity system were significantly higher than the earthquake.	The telecommunications infrastructure was most severely impacted.	The impacts on the transport sector were primarily confined to the roads subsector.	Damage to the water supply systems was entirely attributed to the impacts of the tsunami. No damage was attributed to the earthquake.
Haiti Earthquake 2010	The port of Port-au-Prince is severely affected (North wharf destroyed, south wharf severely damaged), as is the airport (control tower destroyed, runway damaged, etc.)	Damage to the distribution network was more significant.	The telecommunications sector has suffered only limited damage.	As for the road transport network, around 70 km of main roads have been damaged, including certain heavily-used routes.	The earthquake had little impact on water supply systems and waste management systems.
Laos, Typhoon Haima, 2011	Not reported in the PDNA report	Damage and losses caused to the sector were relatively modest. However, the distribution network in 4 provinces was affected.	The flood destroyed the communication systems.	The typhoon caused damage to road networks, bridges, and riverbank protection. Losses were incurred due to higher vehicle operating costs, loss of revenue of the truck and bus operators, costs of clearing landslides, and emergency repair work.	The typhoon and the subsequent flooding caused damage to the piped water supply network.
Thailand, Flood, 2011	The Bangkok's second airport was inundated.	Flooding resulted in significant damage to the power generation plant, sub-stations, and distribution networks, generating severe revenue losses for the sector.	Significant damage was to landline communications in urban areas and industrial estates where services were disrupted.	Total damage and losses in the road sector were more substantial than in railways (7 times) and civil aviation (25 times).	Water-related utilities were able to prepare themselves for the flood; however, floods still had a substantial impact on the sector.
Samoa Cyclone Evan 2012	Economic losses are primarily from the port sector, in addition to the land transport.	Damage and losses incurred both generation assets, and transmission and distribution assets.	Only minor damage incurred.	The sector was damaged by downing trees blocking roads, flooding, and rapid run-off.	Damages were mostly to water supply infrastructure and on-site sanitation systems.
Fiji Cyclone Evan 2012	The extent of damage and loss caused to the sector may have had minimal impact on the whole economy.	Damage to distribution lines (F\$ 4.1 million) was higher than that to generation facilities (F\$ 0.2 million).	A landline service was disrupted due to a power outage and electrical faults.	Damage sustained by roads and highways were higher than marine and air transportation.	Total damage and loss to the sector totalled F\$3.1 million, with a loss valued at F\$ 0.1 million and damage at F\$2.95 million.
Seychelles, Floods, 2013	The Seychelles Civil Aviation Authority experienced some damages on computers and some materials.	The disaster did not affect the sector significantly.	Not reported in the PDNA report.	The road network was severely affected during the several days of heavy rainfall.	The water treatment and sewage systems were adversely impacted, deteriorating quality of water supply and sewerage.

PDNA	Airports and ports	Electricity	Communications	Transport	Water and sanitation
Saint Vincent and the Grenadines, Floods in 2013	The international airport suffered flooding of the runway, causing closure for several hours; however, no significant damages were identified. The country's primary ports were not affected; however, a small pier facility was destroyed	Floods primarily affected all three hydropower facilities. No damage to the transmission and distribution systems were incurred.	Not reported in the report.	The impacts to the transportation system were mainly experienced by the main roads, bridges and riverbank stability.	About 70% of the country was left without piped water due to significant damages to transmission pipes. Solid waste services were suspended due to the severe damages to transport infrastructure.
Solomon Island, Flash Floods, 2014	The international airport was closed for two days due to submergence of the runway and apron. Substantial damage occurred to the central market wharf in the capital.	Not reported in the assessment.	Not reported in the assessment.	The sector accounted for 13% of total damage and losses, which is USD 107.7 million	The sector accounted for 4% of total damage and losses.
Nepal Earthquake 25 April 2015	The aviation sector experienced only minor damage and losses.	Electricity generation facilities, transmission, substations were damaged.	Service providers could restore most of their networks with limited disruption.	Local Road Network experienced more than three times higher damage and losses than Strategic Road Network.	14% of water supply systems sustained significant damages, and 32% had partial damages.
Vanuatu Cyclone Pam 2015	Losses in the sector were due to loss of revenues as a result of cancelled flights, loss of businesses resulting from ships' inability to sail, and salvage costs.	Compared to petroleum and gas subsectors, the electricity in the energy sector was severest affected. The significant damage was to the transmissions and distribution lines.	The communication distribution networks sustained the most substantial damage in the sector.	The immediate impacts of the cyclone on the sector were to (1) sever all modes of transportation and (2) hamper access to economic and social opportunities.	Strong winds and intense rain damaged the sector, which adversely affected health, protection, and education.
Fiji, Cyclone Winston 20 February 2016	Economic losses were from reduced revenues, such as from overtime payment and concessions for humanitarian relief vessels.	The power supply was disrupted to all the Fiji Electricity Authority (FEA) customers.	Damage to postal services was minimal, while damage to communications networks was the worst cross the sector.	The majority of economic losses arose from longer travel times and higher vehicle operating costs.	Damaged and losses were primarily to water supply and sanitation subsectors, not to solid waste management.
Saint Vincent and the Grenadines, Floods in 2016	The airport was completely shut down for three days.	Damages to the electricity sector were predominantly related to hydropower generation.	Not reported in the PDNA in damage and losses.	Primary impact was road blockages, and bridges and culverts suffered significant damage too.	Most of the damage was associated with abstraction system due to sediment accumulation. Sanitation services incurred no damage.
Dominica, Hurricane Maria, 2017	the Dominican Air and Seaports Authority has suffered damages to all of its assets.	Hydropower plant and the transmission and distribution networks were damaged.	High winds and flooding caused damage to the network.	Roads across the island were covered by debris. Six essential bridges were severely damaged.	The water supply, sanitation, and solid waste management systems were damaged
Tonga Cyclone Gita February 2018	The aviation and maritime infrastructure and networks suffered only minor damage.	The restoration was estimated to take seven days to 7 weeks.	Not reported in the report.	The transport infrastructure and networks suffered only minor damage.	Damage and loss to the sector totalled T \$1.85 million

Source: Post Disaster Needs Assessments.



Annex 3: Summary Reports of Symposia

SYMPOSIUM 1

A first **Symposium** was held at WTO on 26 April 2018 and examined the nexus between natural disasters and the multilateral trading system. It identified issues to be studied in the research work.

Opening Session

Moderator: Shishir Priyadarshi, Director, Development Division, WTO

- Roberto Azevêdo, Director General, World Trade Organization
- Elhadj As Sy, Secretary General, International Federation of the Red Cross and Red Crescent Societies
- Frances Lisson, Ambassador, Permanent Representative of Australia to the World Trade Organization
- Kirsi Madi, Deputy Special Representative, Director, United Nations Office for Disaster Risk Reduction

Technical Panel

Moderator: Shishir Priyadarshi, Director, Development Division, WTO

- “Trade and Natural Disaster Response” – Ricardo James, Senior Trade Officer, Permanent Delegation of the Organization of Eastern Caribbean States
- “Trade and natural disaster recovery” – Mina Aryal, Deputy Permanent Representative, (Commerce), Nepal
- “Trade issues arising in emergency response” – Jesper Holmer-Lund, Chief, Emergency Services Branch and the Field Coordination Support Section, United Nations Office for the Coordination of Humanitarian Affairs
- “Disaster Resilience – a private sector perspective”, Maryam Golnaraghi, Director of Extreme Events and Climate Risks Program, The Geneva Association

Comments from the floor

Information Session

- Overview of research project on Natural Disasters and Trade – Michael Roberts, Head, Aid for Trade Unit, Development Division, WTO



Opening Session

805. **Shishir Priyadarshi, Director, Development Division**, welcomed participants and outlined the purpose of the Symposium as examining the steps that the trading system could take to help countries facing natural disasters. He then invited the Director-General to give his keynote remarks.
806. **Roberto Azevêdo, Director-General, World Trade Organization** began his intervention by asking: "How can trade policies and practices help in dealing with natural disasters and what could the WTO itself do to support this effort?". He recalled that the United Nations Office for Disaster Risk Reduction (UNISDR) argued that "disaster risk reduction is everyone's business" and he hoped that the Symposium would stimulate dialogue on this issue. He suggested there was a need to better appreciate the nature of the hazards faced, to understand the work that is being undertaken to respond to disasters, to promote recovery and resilience. The Symposium was an opportunity to share ideas and explore what role the trade community might play in tackling this issue. He welcomed the participation of the International Federation of the Red Cross and Red Crescent (IFRC), UNISDR and others both within and outside the UN system. Director-General Azevêdo expressed his thanks to Ambassador Lisson and the Australian Government for their support to take this work forward.
807. While to some it might not be immediately clear what role trade had in the debate on natural disasters, Director-General Azevêdo highlighted some connections that had already been made by WTO Members themselves. The Declaration by Dominica and other Eastern Caribbean states which was made at the WTO's eleventh Ministerial Conference in December last year in Buenos Aires was one example. This Declaration, and the plenary statements made by Ministers highlighted the catastrophic damage caused by last year's hurricane season and the role that the multilateral trading system could play in promoting recovery by enabling the flow of essential supplies.
808. Director-General Azevêdo highlighted that natural disasters appeared regularly as an issue in Trade Policy Reviews (TPRs). Haiti's 2015 TPR was a case in point; it discussed the 2010 earthquake and successive storms that had hit the island after the terrible earthquake. The Tohoku earthquake and tsunami were referenced in Japan's 2013 TPR and references to Hurricane Katrina could be found in past TPRs of the United States. Vanuatu 2018 TPR would be an opportunity to look at recovery from Cyclone Pam. This cyclone had delayed Vanuatu's graduation from least developed country status until 2020 and was an indication of the impact that these events could have. Amongst the waivers approved by the General Council were trade preferences granted to Nepal in the wake of the April 2015 earthquake and a package of tariff preferences for Pakistan after their 2010 floods.
809. Natural disasters had also been raised in the context of the Trade Facilitation Agreement. Director-General Azevêdo recalled the view of Ambassador Conejos from the Philippines that the TFA "would provide an enabling environment to allow Members to respond more quickly to future crisis". Against this background, Mr Azevêdo argued that there was a role for trade in supporting resilience. He noted services trade, for example, as essential in providing the necessary insurance cover.
810. To date, the WTO had been largely reactive on this issue. The organization had been finding solutions and highlighting problems as and when they arrived. There had not been any initiative to examine this problem holistically and to considering ex ante how to respond. He noted that the effects of measures could cut both ways. The right trade measure could help boost supply side capacity and restore trade after a disaster. The wrong measure could stifle recovery, erode resilience and restrain development.
811. Outlining how to move forward, he noted that there was already a body of work at WTO that could be examined and a tremendous amount of work that was going on in other bodies. How we moved forward would be up to Members and there was no intention to create new processes. He expressed confidence that the trade community would play a positive role in responding to this urgent issue. Director-General Azevêdo concluded his remarks by noting that studies suggested that the frequency and severity of natural disasters was likely to increase. In short, this issue was not going to go away. He recommended that we be better prepared and better informed the next time that we are called to respond.
812. **Elhadj As Sy, Secretary General, International Federation of the Red Cross and Red Crescent Societies (IFRC)** stated that the severity and frequency of natural shocks and hazards, was increasing as evidenced by recent data published by the World Meteorological Organization. Forty years ago, in bad years, IFRC had had to respond to 80 or up to 100 shocks and hazards per year. Looking now at the frequency of response there were about 400 shocks and hazards per year. The number of incidents had more than quadrupled not only in number, but also in severity.
813. He pointed out a combination of elements that were driving this process. These included climate change and demographic pressure seen in parts of the world that were prone to disasters as well as unplanned urbanization that were creating new forms of risks and increasing the vulnerability of millions of people across the globe.
814. Secretary General Sy recalled spending time in Sierra Leone and Guinea at the height of the Ebola



crisis. Some of the measures taken at that time had exacerbated underlying problems and increased mortality and morbidity. These measures had included the closure of borders, cancellation of flight connections, closure of markets and restrictions on the use transportation facilities. These measures had impacted income, access to medical services, and it also affected the nutritional status of pregnant women and babies. Secretary-General Sy emphasized the importance of market access and income generating activities in building resilience in the face of shock and hazards.

815. Another example he cited was standing in the rubble of Antigua and Barbuda after the last cyclone season in the Caribbean. IFRC had provided short-term humanitarian assistance to the population of Barbuda evacuated to Antigua, such as food, shelter, water, sanitation, hygiene and health. Some 15% of the evacuated population had decided to go back to Barbuda citing a lack of trading possibilities, banking facilities and markets.
816. Challenges faced during humanitarian responses included trucks with relief goods lining up for days, containers getting stuck on ports and not being facilitated because of customs regulations that did not consider the situation of natural hazards and disasters. In addition, it was sad to see that when people needed food, it was being rationed at the port or at the airport. Or the situation when people needed drugs and those drugs had expired because they had been stored in the sun in normal containers or had too short a shelf-life to be effective.
817. Noting that shocks would happen and could not be prevented, Secretary General Sy stated that humanitarian assistance and logistical problems had more to do with elements that were related to trade, customs and non-customs regulations than disasters. He expressed his concerns that despite all the information and science available today, the level of preparedness was still very low.
818. Citing monsoon and cyclone seasons and cyclical droughts as some of the shocks and hazards that became disasters at a scale that impacted many people's lives, Secretary General Sy emphasized that the level of preparedness, or lack thereof, would determine if those shocks would become a disaster or not. Furthermore, in the arsenal of preparedness tools and mechanisms available, trade related elements were also extremely important. In this context, he stressed the importance of engaging with member states and organizations like the WTO to make sure that there was an enabling legal and regulatory framework that would allow for such kind of work to be undertaken.
819. The level of preparedness, or lack thereof, would determine future mortality and damage from climate-related disasters. And that was pushing people to say there was no such thing as a natural disaster, all disasters were manmade. Shocks

and hazards may be natural, but the disasters depending on us, human beings, on what we do on time or what we fail to do on time.

820. Mr Sy expressed his appreciation for the research being undertaken which would help deepen the understanding of the correlation between different elements, but more importantly point out more systematic ways of doing managing disaster. He mentioned that the WTO had been partnering, sometime on an ad-hoc basis, convening member states and the National Societies of the Red Cross and Red Crescent to work on specific cases. Member states such as Fiji had been using platforms such as the climate summit to put those issues on the table and this drove SG Sy to ask how those different pieces could be brought together in a solid piece of research.
821. After the response and recovery from shocks and hazards, it was important communities were not left in the same situation of vulnerability. This would mean changing building costs and dysfunctionality. He also emphasized the need to have long-term agreements, pre-position supplies for early response ensuring goods arrive in places where they are intended in the most efficient way. Doing that would create trade possibilities, open new markets and market access.
822. Secretary General Sy also pointed out that the humanitarian world was changing its modus operandi in disaster-affected places as well as in conflict affected states, moving away from away from delivering of supplies in a sophisticated and complicated way to cash transfer programmes. This would incentivize the local economies and local markets and also provide opportunities for the private sector to bring goods in a way that was needed thus creating trade opportunity.
823. He recalled the devastations experienced during Philippines' cyclone season where coconut trees were falling on housing and people but as soon as the dust settled and the recovery phase came, trade opportunities opened up through exporting coconut wood out of the rubble. This served as an entry point for trade as well as an exit strategy contributing to the income generating activity and resilience building.
824. In his concluding remarks, Secretary General Sy drew attention to the Trade Facilitation Agreement of 2014, as well as the joint research which he hoped would allow for the consolidation of a base to work together in two ways: deeply understanding the interconnection and the correlation between those different elements, finding ways of partnering to respond early, respond fast and to respond better. Doing that would build resilience, open new markets and use trade for the improvement of the lives of people that were affected in many parts of the world.



825. **Frances Lisson, Ambassador, Permanent Representative of Australia to the World Trade Organization** began her intervention by recognizing that addressing the trade related challenges arising from natural disasters was a priority for many WTO Members. She highlighted that Australia was highly exposed and the total economic costs for natural disasters from natural disasters was on average 18.2 billion dollars per year. Australia's risk profile was increasing due to the climate change, population growth and urbanization. One estimate suggested that Australia's annual losses from natural disasters would more than double by 2050.
826. The Indo-Pacific region was one of the most disaster prone in the world and many of Australia's closest neighbors were particularly vulnerable to earthquakes and serious weather events. She referred to examples of shocks and hazards experienced in 2018 including: earthquakes in Papua New Guinea, cyclones and floods in Fiji, Samoa and Tonga and volcanic eruptions in Indonesia, the Philippines and Tonga. These events had devastating impacts, for example more than 34,000 people had been displaced following the earthquakes in Papua New Guinea. Tropical Cyclone Pam in 2015 had caused to Vanuatu the value of 64% of its GDP. Tropical cyclone Winston in 2016 affected 540,000 Fijians, nearly two-thirds of that country's population.
827. Noting that the interruptions to trade that result from such events could be devastating, Ambassador Lisson highlighted that there had been comparatively little work on the links between trade and natural disasters. She suggested that increasing a country's disaster resilience had benefits on that country's capacity to trade. Strengthening a country's trade regime before natural disasters hit, its policy regulations and infrastructure could increase its overall resilience to natural disasters. For instance, more liberal sectors' policies would allow for greater provision of much needed services from insurance to medical services to ICT, both in the lead up to and in the wake of natural disasters. Improved customs procedures and certification processes would quicken the delivery of much needed goods and internationally consistent standards would help develop disaster resilient infrastructure.
828. Given the importance that trade plays in a country's development and UN member's commitment to investing in disaster reduction under the Sendai Framework for disaster risk reduction, she pointed out that further work on this question was vital. Australia had offered the WTO an extra budgetary contribution of CHF 110,000 to conduct research examining the trade impact of natural disasters as well as the role that trade measures play in natural disaster response, recovery and resilience. This work would build on the support Australia currently provides on natural disasters through their overseas and humanitarian programmes, particularly in the Indo-Pacific region.
829. In her concluding remarks, Ambassador Lisson encouraged other WTO Members to support this important initiative and stated that she was looked forward to discussing the findings from the initial research and scoping work with other WTO Members once it is completed later this year or early in 2019.
830. **Kirsi Madi, Deputy Special Representative, Director, United Nations Office for Disaster Risk Reduction (UNISDR)** expressed her appreciation for the WTO initiative. She described the UNISDR as the focal point in the UN system for the coordination of the disaster risk reduction. It had been established in 1999 following the international decade for natural disaster reduction which sought to raise awareness of the underlining risks which drive disaster events.
831. On natural shocks and hazards, she emphasized that preparedness for response and effective understanding and reduction of the risks related to them that made all the difference. Following the Indian Ocean tsunami in 2004, the United Nations had adopted a 10-year blueprint for reducing disaster losses known as Hyogo Framework for Action.
832. In 2015 when member States met at the third UN World Conference on Disaster Risk Reduction in the city of Sendai in Japan, the conclusion was that most countries had made progress in managing and responding to disasters and good progress had been made in reducing mortality as well as in improving preparedness. However, examples where the risk of disasters was understood and was fully factored into social and economic investments or where risk knowledge was fully integrated into development planning and decision making were still an exception.
833. The Sendai Framework for Disaster Risk Reduction adopted in 2015 then came into play. It was a 15-year non-binding, voluntary agreement which had been adopted by all the member States. It applied to small- and large-scale disasters caused both by natural hazards and man-made hazards as well as related environmental, technological and biological hazards and risks. The Sendai Framework represented a paradigm shift for managing and reducing disaster risks and strengthening the resilience of the societies to react and cope with shocks. The Sendai Framework set 7 clear global targets for reduction in disaster losses both economic, financial, human losses and it also set out goals and targets to increase collective action to enable these targets to be reached.
834. In March 2018, Member States started to report on their progress made against those 7 targets of the Sendai Framework including: substantial reduction in the loss of life; reducing numbers of affected



people; reducing the economic loss and damage to critical infrastructure.

835. Deputy Special Representative Madi highlighted accountability as a cornerstone of the Sendai Framework and emphasized the importance of monitoring processes. These processes would be conducted coherently together with reporting against the Sustainable Development Goals (SDGs), and many of the 38 indicators of the Sendai Framework coincided with SDG indicators. She mentioned other enabling targets; one which aimed at increasing substantively the number of national and local disaster risk reduction strategies to be in place by 2020; and a target related to the Paris Agreement on having national adaption plans, bringing the different perspectives and looking at the progress in this critical area in a coherent manner. She mentioned that reporting would soon start on enhanced international collaboration for disaster risk reduction and increased access to early warning and risks assessments.

836. The Sendai Framework recognized that the primary responsibility for reducing disaster risks rested with the governments and that progress would not be possible without an inclusive approach. Various stakeholders had a key role to play, especially the private sector and including everyone involved in trade and was dependent on uninterrupted access to markets and global supply chains. The implications of successful implementation of the Sendai Framework would be profound for sustainable development and the resilience of society

837. The World Bank estimated that the annual cost to the global economy of disasters amounted to 520 billion dollars. The greater burden of absolute economic losses fell on high income countries like US which suffered a record number of billion-dollar disasters in 2017, yet it was the low- and medium-income nations which suffered the greatest setbacks and lost most if not all of their development gains. Resources spent on reconstructing damaged infrastructure could be spent more productively on fostering more competitive economies and investing in areas of social expenditure such as health and education. She stated that disasters affected business performance and undermined the longer-term competitiveness.

838. Globalized supply chains created new vulnerabilities. A case in point was that of Toyota which lost US 1.2 billion dollars in revenue as a result of the 2011 Japan earthquake and tsunami due to shortages for parts which affected then vehicle production in the US, India and China. Food security was another area where the world trading system had been severely tested. The global food crisis in 2007 and 2008 was triggered by a series of poor harvests caused by drought in different parts of the world. Over 30 governments had imposed export restrictions as fears grew of domestic food shortages. Protests had erupted in 61 countries

and resulted in violence in 23 countries. This was one of the most traumatic manifestations of the impacts of drought risks on the international trading system to exacerbate humanitarian needs and to contribute to political and social tensions around the globe.

839. Trade had the potential to be a driver for the successful implementation of the 2030 Agenda for Sustainable Development, and for achieving the eradication of poverty. To do that, trade would need to be inclusive and address inequality by taking affirmative action to support those countries which were on the front line of climate change and extreme weather events.

840. Deputy Special Representative Madi concluded her intervention by emphasizing the importance of the WTO research considering how much damage earthquakes and extreme weather events had inflicted, particularly on low and middle-income countries in recent times. She mentioned that disruption to manufacturing, tourism and trade would play a significant role in the GDP losses sustained in these events, particularly in the small island, developing states.

Technical Panel

841. **Ricardo James, Senior Trade Officer, Permanent Delegation of the Organization of Eastern Caribbean States (OECS)** began his presentation by recalling Dominica Prime Minister's address to the United Nations in which he had stated that the Eastern Caribbean was at the front line of climate change and its impacts. Mr James highlighted that 2017 had been a particularly devastating year in terms of hurricanes. He focused his presentation on the experience of Dominica with Hurricane Maria. Living in the hurricane belt in the eastern Caribbean was becoming increasingly traumatic and stressful for the citizens.

842. Recalling his childhood, Mr James recounted the experience of growing up in Dominica in the wake of the 1979 Hurricane David. He remembered being in the house with his family and hearing the wind and the rain coming in. That was his first experience of a hurricane. Tropical storm Erika in 2015 had also hit the island. Growing up, most of the younger generation viewed hurricanes as something that could be an exciting event. After Hurricane Maria, all that had changed, and there was concern at the increasing frequency and intensity of hurricanes and the economic impact that it can cause on small island states like Dominica and other OECS countries.

843. The Caribbean faced other hazards too ranging from hurricanes, earthquakes, volcanos, including Tsunami threats and floods. These disaster events destabilized growth prospects. Hurricane Maria had been the worst natural disaster on record for Dominica and the tenth most Atlantic hurricane on record. Another feature of Hurricane Maria



- was the way it had rapidly intensified. Mr James recalled that his mother had informed him that the hurricane was not going to hit Dominica and cast doubt on the accuracy of predictions. Less than 24 hours later, Dominica had been directly hit by the category five hurricane. On September 17, Maria had been a category one storm, but 24 hours, it had grown to a category five hurricane. The day before hurricane, on a Sunday, no one thought that they would face such a category five hurricane; so many people were caught off-guard. When the hurricane made landfall at 9.15 Atlantic Standard Time, the intense and heavy rainfall, severe winds, flash floods, landslides, inflicted damage to almost every roof, buildings were swept away, communication services destroyed.
844. Dominica was known as the "Nature Island" of the Caribbean. When Mr James returned on 23 September, he was struck by the lack of green. All the mountains had been stripped bare. Trees had been stripped of their leaves and were sticks sticking out of the ground. The damage was catastrophic. The economic impact based on a post disaster needs assessment was estimated at 226% of the 2016 gross domestic product for the island. He mentioned that the identified recovery and needs for reconstruction incorporating the principle of Building Back Better where possible amounted to US 1.37 billion dollars. A total of Eastern Caribbean 9.4 billion dollars had been lost in income, with a 25% reduction in overall consumption likely increasing the poverty head count from 28 to 42% of the population. A deficit of 21% of GDP had been projected for 2018.
845. Tourism, which was a growing sector for Dominica, had incurred a loss of US\$116 million dollars and needed US\$20 million for recovery. Agriculture had suffered USD 179 million in losses; commerce and micro business USD 77 million. Many schools and hospitals had been damaged or destroyed. Around 90% of the housing stock had suffered damage, either from loss of their roof or total destruction. There had also been damage to roads and bridges; water and sanitation and damages to the electrical grid and the telecommunications infrastructure.
846. According to Antigua and Barbuda's Prime Minister, the Honourable Gaston Browne, Barbuda had been rendered uninhabitable by the passage of Hurricane Maria and the entire population had had to be moved over to Antigua. Dominica was a small island developing state with limitations in terms of its administrative, legislative, regulatory infrastructure and governance. Disasters made the job of governance and managing the economy much more difficult, but the government, the Prime Minister and the people were rising to the task.
847. The long-term goal in the aftermath of Hurricane Maria, was to make Dominica the first climate change resilient nation in the world as had been indicated by the Prime Minister in his address to the United Nations.
848. A response plan had been put in place and relief provided by many governments, regional and international organizations and agencies, who had come to the aid of Dominica. A pledging conference for the Caribbean had also been held at the UN. In terms of recovery, the goal was to have restore key infrastructure, utilities, water, electricity, telecommunications, rehabilitation of roads and bridges, stimulation of the domestic demand. In terms of economic policies, some measures would include tax and duties exemptions, provision of grants and financial support to the agriculture sector and farmers to help them to rehabilitate agricultural production. It also included ensuring job creation because immediately after the hurricane and with the destruction of hotels, supermarkets and small businesses, there was an immediate rise in unemployment on the island. There had also been an immediate rise in emigration. Dominica's population hovered around 70,000 people, but it was estimated there had been an exodus of approaching 20,000 people to neighbouring islands that 14 days after the hurricane.
849. Building a resilient Dominica was the long-term goal, one it shared with many other countries facing natural disasters linked to climate change. He outlined that the goal was to develop national climate resilience and a recovery plan. This was an ongoing process that had been initiated and it would require the creation of agency to coordinate and spearhead this process. The climate resilience executive agency for Dominica was being supported by donors who provided resources.
850. Emphasizing build back better as the underlying goal and theme, he mentioned some of the elements in increasing Dominica's resilience: new construction codes, investment in new climate resilience systems to ensure food security, energy security and ICT security, identification and use of international best practice approaches for the construction of climate resilient, energy efficient, affordable homes and houses.
851. Mr James noted the importance for small island states to find ways to reduce their vulnerability and increase their resilience. He recalled that during MC11, there was an initial proposal to acquire from the WTO some flexibility and recognition of the destruction caused to trade. The OECS had proposed some textual language of a political nature that would be reflected in the outcome document. Ministers of the group of small and vulnerable economies had issued a declaration in which they highlighted the impact of natural disasters on trade and to call for the full flexibility of the multilateral trading system to be deployed regarding reconstruction measures. He proposed a more concrete reflection of this declaration at the WTO and welcomed the proposed initiation of a research project on this issue. He highlighted Article IX which provided for waivers, as a provision that could be used by Members given the unpredictable nature of the shocks and hazards.



He mentioned the need to explore a more systemic, methodological approach with a system that would automatically kick in if a country faced a natural disaster.

852. Mr James posed the following questions: What additional flexibilities and special and differential treatment could be provided? How could aid be further facilitated by the various rules? How could the Trade Facilitation Agreement facilitate the import or the provision of aid from outside? And how could the rehabilitation of productive sectors and the export trade be facilitated by market access? He suggested that other measures, such as Article 27.4 of the Subsidies and Countervailing Measures Agreement provided for transition periods that allowed certain developing countries to continue to provide certain subsidies that were prohibited. Noting that this provision had been phased out, he suggested that this was an area that could to be explored. In his concluding remarks, Mr. James stated that OECS countries were prepared to make specific proposals and submissions as necessary, engaging with other members to be in consensus as appropriate.

853. **Mina Aryal, Deputy Permanent Representative, (Commerce), Nepal** began her intervention by highlighting research indicating Nepal as the fourth most earthquake vulnerable country in the world and eleventh in terms of climate induced hazards. An earthquake measuring 7.6 on the Richter Scale by Nepal's National Seismological Centre struck at 11.56am on 25 April 2015. A further earthquake, measuring 7.3 on the Richter scale, had struck on 12 May with an epicentre 76 km northwest of Kathmandu. The National Seismological Centre had also recorded more than 40,000 aftershocks of more than 4 on the Richter scale.

854. The earthquakes claimed over 9,000 lives and left more than 22,000 people injured. Thirty-one of Nepal's 75 districts had been affected of which 14 were severely damaged. Roads, bridges, schools, heritage sites, monuments, hospitals, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities were all impacted, some being severely damaged. Hundreds of historical or cultural monuments and temples had been destroyed or damaged, including seven sites out of ten listed by UNESCO World Heritage.

855. After the quake, a meeting of Disaster Central Relief Committee had been held within two hours. National Emergency Operation Centre provided an initial report to the Central Disaster Relief Committee which focused on search and rescue, and lifesaving actions. International search and rescue (SAR) teams from 34 countries, including Nepal's immediate neighbours, responded to Nepal's request for help. Under the SAR search and rescue, more than 4,000 helicopters flights and over 90% of security forces and over 22,500 civil servants had been mobilized immediately. As

a result, 7,500 people had been rescued by air and around 5,000 by land under the SAR officers.

856. Recovery and reconstruction was under way. According to National Reconstruction Authority, by 25 February 2018, over 100,000 houses had been rebuilt and more than 300,000 houses were under construction. The construction of 207 government buildings had been completed and 125 were under way. Similarly, construction of 2,890 educational institutions had been completed with 1,458 under construction. Reconstruction of 79 cultural and heritage sites had been completed and 111 were in the works.

857. The recovery phase normally involved a set of policies, tools and procedures; restoration of basic services and the repair of physical, social and economic damages; rebuilding of roads and bridges, restoring economic activity, etc. The goal of recovery was to return the community's system and activities to a normal situation and achieve services regularly. In addition, the recovery phase would involve development coordination and execution of services and it would take several years to rebuild all sectors including agricultural, manufacturing and services. Noting that this would be the most important phase of disaster management, she called for international support.

858. For a resource-constrained country like Nepal, she highlighted that reconstruction and full recovery after a big disaster would be a significant challenge and take time. She highlighted that the government of Nepal expected that donor and development partners would come forward with timely disbursement of their commitments in the aftermath of disaster.

859. She mentioned that the nexus between trade and natural disasters was complex and challenging and that such a situation called for a cooperative and collaborative approach. Trade measures had an on the whole cycle of disaster management such as preparedness, rescue, recovery and reconstruction. The rescue and relief activities – basically the supply of shelter-related materials and food items – suffered the most from trade measures such as customs duties, documentary requirements and test procedures and so on.

860. Similarly, natural disasters had an impact on trade and economic development. At a time when Nepal was regaining its trajectory of faster economic growth and prosperity, the severe earthquake damage had depressed annual growth projections from 4.8% to 0.8% for the year 2016. The actual growth rate had been only 0.7%.

861. Tourism had been adversely affected. Over 90% of tourists had cancelled their bookings. The Post Disaster Needs Assessment stated that about 33% of cottage industries had been severely affected in 14 districts, that were hit hardest by earthquakes. In agriculture, the earthquake had destroyed



stockpiles of stored grains and devastated the livestock sector.

862. Supply-side constraints included a low-level of physical infrastructure development, the downward spiral of export performance and the decreased productive capacity and the high cost of doing business. The disaster exacerbated this situation, creating a lot of hardship in the production process and productivity.

863. Another challenge was coordination of aid by donors to accomplish the rebuilding and reconstruction task as per the Post-Disaster Recovery Framework 2016-2020. Similarly, reviving the damaged industrial infrastructure and keep them competitive in the market would also be a challenge. The ballooning trade deficit presented another challenge. At present, the ratio of export to import was one is to 14.3.

864. Regarding the way forward and role of the multilateral trading system. She suggested the following areas of collaboration:

- First, the acknowledgement of the proposal submitted by the Caribbean and Small and Vulnerable Economies for flexibilities in the WTO obligations required for recovering from natural disasters submitted during MC11, contained in document WT/MIN (17)/37.
- Second, implementation of the Trade Facilitation Agreement, particularly measures related to advance rulings, release and clearance of goods, border agency cooperation, relief from stringent test procedures, and freedom of transit which could be critically important for disaster management.
- Third, encouragement of special trade preferences schemes granted by the developed and larger developing countries in a position to do so, to help in the speedy recovery of the trade of countries hit by disaster. Nepal had received such support from the United States of America in December 2016 through which preferential treatment had been granted to 66 tariff lines of Nepali products exported to US market. The objective was to help Nepal to recover from the natural disaster which had set back Nepal's economy and trade sectors. The waiver was granted until the end of 2025, under Article IX:3 of the Marrakesh Agreement Establishing the WTO.
- Fourth, to enhance institutional capacity such as those of the National Reconstruction Authority, the National Disaster Relief Fund under the Chairmanship of the Prime Minister, the National Seismological Centre and other concerned agencies. This would be essential for applying the Build Back Better approach encouraged by the Sendai Framework for disaster risk reduction.

- Finally, to support the building of a robust trade related infrastructure and enhance productive capacity through predictable, transparent and enhanced Aid for Trade and support from the Enhanced Integrated Framework. Such support could be instrumental to support in the recovery, reconstruction and resilience building of trade and the economy.

865. Jesper Holmer-Lund, **Chief, Emergency Services Branch and the Field Coordination Support Section**, UN Office for the Coordination of Humanitarian Affairs (UNOCHA) began his intervention by sharing his views from a humanitarian perspective, discussing the reality on the ground and some of the initiatives undertaken which were creating a space for connections between the commercial and humanitarian system.

866. UN agencies had a responsibility to facilitate effective delivery of assistance to people in need. He recalled that when Hurricane Ivan and Maria swept through the Caribbean, UNOCHA was tasked with deciding on whether to contact potential affected governments. UNOCHA requested for international assistance and it deployed expert teams to facilitate the coordination of the humanitarian assistance.

867. One stereotypical perceptions people had about natural disasters was that people affected by a flood or other event fled their homes, gathered somewhere and the government and international community came in and rescued them, with international assistance pouring in to help. The reality was different. The number of disaster events was going up and the question as to whether this was because of climate change, population increase, or urbanization remained moot. On average, every year the numbers of casualties were going up, but disaster affected Members were getting better and better at handling these types of situations which in turn led to fewer requests for international assistance.

868. Early warning, preparedness and resilience was already having a significant impact. Compared to previous 2016, there had been a sharp drop in death tolls arising from climatic and non-climatic. This was because of early warning mechanisms. UNOCHA was aware of when hurricanes would happen and they therefore informed people beforehand.

869. Many countries had built resilience. For example, in Bangladesh the number of deaths had declined significantly as the Government of Bangladesh had built in very strong systems of early warnings, the population had been trained and they knew exactly where to go in case of an alarm. For non-climate disasters such as earthquakes, tsunamis, building resilience would involve building codes, and measures such as sea walls.

870. Looking at the financial impact of natural disasters, he highlighted two peaks; one after Hurricane



Katarina and another after the tsunami in Japan. Another peak would occur in 2017 because Hurricane Irma had affected Florida and prompted the highest financial losses ever recorded by a disaster.

871. Urbanization meant that most people affected by natural disasters lived in cities and this created a totally different dynamic as to how assistance would be provided. Using as illustration a photo of himself that he had taken during Yolanda typhoon in the Philippines, he highlighted that the role of UN humanitarian response was bringing life back to a level of normality where livelihoods were restored, people had food and water, access to education and they were protected from violence.
872. The reality of today's disasters was not only that people needed food, shelter, healthcare, protection but also connectivity to connect with loved ones. He recalled working six months in Mogadishu five years ago and Mogadishu was at that time the capital in the world with the highest number of mobile phones per inhabitant. He was a bit surprised to see that the average Somalian had 3 to 5 mobile phones. This was because the different networks did not interlink so you could not have roaming between the networks, but secondly the phone was your life insurance because that would tell you where there were risks or where there were opportunities to get food. He urged Members not underestimate the importance of connectivity. Re-establishment of markets was a key indicator that life was returning to normalcy.
873. Humanitarian agencies were shift from traditional delivery of assistance to re-establishment of infrastructure that was there before that enabled people to procure goods and services. The humanitarian world was moving further and further away from the expensive distribution of relief to distributing credit cards and cash through SMS vouchers or other means. That would allow the affected community to decide what they needed because they would be able to procure what they felt were the most important commodities for them. He emphasized the need to establish infrastructure that would allow the use of these mechanisms and the need to ensure that the market economies were back again and the trade was reappearing. Mr Holmer-Lund gave another example from Turkey where there were 3.5 million Syrian refugees. They received credit cards at age 18 and a fixed amount of money every month with which they could go and shop for whatever they felt they needed.
874. Infrastructure was core to recovery. During operations, assistance was organized in clusters; clusters around healthcare, food, water, sanitation and education. He recalled leading an operation in the Philippines after Yolanda and recalled that they started experiencing challenges after some months. He then met with his Philippine counterparts who told him what they were experiencing in the different 11 clusters but he kept insisting that they were 12 clusters as one was needed for electricity, because without electricity there would be no recovery of markets, no industry, and no livelihoods. Without the appropriate infrastructure, whether it was for transportation of fuel or electricity etc. there would be no regeneration and no re-establishment leaving people dependent on humanitarian assistance.
875. The humanitarian world was shifting from the rural operational approach to an urban one which was more complicated. There was a need to rethink and understand the vital role that commerce played. He pointed out that the way the private sector was promoting themselves especially through social media and this imposed yet another challenge. He echoed WCO remarks on instances where donor countries that shipped relief supplies indicated their preferences for relief commodities through ASYCUDA or ASYREC and this limited the donor private companies.
876. Scarcity of products during the recovery period created a direct impact on prices and he emphasized on the importance of bringing back markets which would allow people to buy products at the same price as they had before. He recalled challenges faced during the ebola epidemics where countries were closing off borders. Despite having effective humanitarian assistance, disasters had a negative impact on commerce, transportation and storage.
877. There was a need to rethink long term the impacts of humanitarian donations. Here he recalled the earthquake in Haiti. Well-intended organizations came in and distributed water for free so driving companies on the island with commercial water production out of business. As soon as the international organizations ran out of supplies, though, there was nobody to distribute food and water anymore.
878. He mentioned some of the initiatives that had been put in place such as the IFRC's International Disaster Response Law that set out a framework of responsibility and technical laws on customs. He called on members to look at these laws that put responsibilities on affected countries to go and see how organizations handled specific situations, and how they dealt with migration of international relief workers.
879. **ASYREC**, [Automated SYstem for RELief Consignments] was a customs facilitation programme that allowed customs facilitation without any delay of relief consignments. The initiative had been started to get airports ready for disasters and making them more effective. Airports became bottlenecks in emergencies. One of the big challenges the international community had in responding in Nepal was that thousands of tourist trekkers had been left stranded at the airport and could not depart as commercial flights had stopped operation to allow relief flights to pick them up.



People were stranded at the airports because their airlines could not pick them up.

880. Mr Holmer-Lund concluded his intervention by discussing UNOCHA's **Connecting Business Initiative**. This initiative came out of the World Humanitarian Summit and would bring commerce and the private sector together in disaster-prone countries before an emergency occurred.
881. Maryam Golnaraghi, Director of Extreme Events and Climate Risks at Geneva Association divided her presentation into three parts. A first segment would discuss disaster losses and how disasters impacted governments and the economy. A second section discussed the global movement over the past decade to building economic resilience. The third part would discuss the role of market-based insurance in bringing financial resilience and recommendations in this regard.
882. Over the past five years not only had the number of natural disasters grown, but the financial impacts of these disasters had increased together with the insured losses. Referring to Munich Re information on global disaster loss information, she highlighted that weather-related disasters accounted for over 90% of total disasters. The frequency and severity of these disasters was on the rise, and were linked to the changing climate. The financial impacts of disasters was increasing due to vulnerability linked to fast urbanization, higher concentrations of people and properties in high-risk regions, poor development planning and construction practices. Complex inter-dependent supply chains and trade patterns cascaded the failure effects of critical infrastructure, and the impacts of natural and man-made catastrophes as witnessed in Japan in 2011. In addition, climate change played a critical role particularly in relation to changing patterns of hazards.
883. Examining direct impacts, she stated that losses were experienced in government budgets because of emergency spending on relief and response, relocation of affected and/or at-risk citizens, reconstruction or improvement of non-insured or partially-insured public infrastructure and family dwellings, costs of social and economic programmes for rehabilitation and recovery, contingent liabilities for state-owned and other enterprises. She focused attention on what really needed to be accounted for in terms of what constituted financial losses and solutions in managing these losses.
884. The disruption of supply chains and exports market access had global impacts that resulted in supply-chain destructions around the world. She emphasized the need to think about countries with limited economic diversity where a single large catastrophe could lead to profound economic impact. For low-income nations, these types of economic shocks could deepen poverty levels and lead to complex emergencies, such as droughts and related complex events that could follow.
885. Explaining the concept of disaster risk management over the last five decades, she noted that climate change and sustainable development had emerged from humanitarian, scientific and environmental debates into an economic debate. The Sendai Framework for Disaster Risk Reduction, the Paris Agreement on climate change and the Sustainable Development Goals all addressed the impacts of natural disasters as an economic development issue as part of their priorities for action. She highlighted a study which showed that natural disasters had become a responsibility of the ministries of emergency, preparedness and response. As a result, this issue had always been handled as a humanitarian one with reference to the "disaster cycle of relief and response followed by recovery and reconstruction". However, thinking around these issues were starting to evolve into much more comprehensive all-of-society approaches aiming at preventing and reducing these disasters. One dollar spent in prevention could save anywhere between four to ten dollars in response and recovery. Similarly, in the area of climate change and sustainable development, these topics had emerged from the fields of science or environment, but increasingly though there was recognition of the profound economic implications and the necessity for converging these areas under the national economic development and budgeting of nations. Over the last decade, a highly complex global stakeholder landscape had emerged supporting governments with respect to the development of their capacity for addressing disasters with a more preventive and preparedness approach. She emphasized the need to focus on early warning systems and building the resilience before a disaster struck.
886. A comprehensive stakeholder landscape had emerged that now span into development communities, international and development banks, the United Nations community as well as the private sector, and particularly the insurance industry. There was also convergence with what was coming out of the scientific community, where governments were starting to realize a paradigm shift in their approaches from post-disaster response towards a more proactive approach to addressing and managing financial and societal impacts of disasters. This approach had been highlighted in Sendai Framework for Action.
887. Ms Golnaraghi highlighted that the basic element to be able to manage financial risks of disasters was the ability to quantify those risks: Who is at risk? What is the nature of that risk? Can we quantify that risk? Can we price that risk? Through cost risk analysis, governments had started to look at risk reduction and preventive measures to reducing existing risk and to prevent new risk. These were through actions such as land zoning, development and enforcement of building standards, as well as



investing in natural infrastructure and buffer zones to create distance between people and as natural hazards to just name a few. A critical element of development over the last decade had been the recognition by governments of the need for pre-disaster financial planning and the important role that market-based insurance and risk-transfer mechanisms played in bringing financial stability and resilience in face of disasters.

888. Recalling the issue of building back better, she urged Members to think about building back smarter given that disasters hit some countries recurrently. This had become part of the conversation in many countries and the whole framework was starting to come into focus of ministers of finance and planning in many countries around the world. The role of market-based insurance and alternative risk transfer mechanisms was starting to be recognized by governments and it was increasingly recognized that interconnectivity and vulnerability of supply chains was further adding to societal and economic vulnerability.
889. Market-based insurance was helping nations to build their economic resilience to disasters. A number of empirical studies from previous disasters had shown that countries with more mature insurance markets recovered faster and even realized economic benefits following a disaster. It was mostly the uninsured part of catastrophe-related losses that drove the subsequent macroeconomic losses. Recalling the tsunami and nuclear accident in Japan versus the 2004 Indian Ocean tsunami, she compared the experience of fishers. Insurance for fishers in Japan had allowed them to replace their instruments and boats and be able to go back to sea whereas many fishermen around the Indian Ocean lost their livelihoods.
890. Since 2005 new insurance and risk-transfer mechanisms had been developed in many countries, particularly in middle and low-income nations. These types of solutions were being developed through development of national insurance programmes, or was the case of the Caribbean, the Pacific and Africa, through the development of regional facilities providing insurance support to governments in anticipation of a disaster or post-disaster. These mechanisms ensured that funds were available to the government in a more reliable fashion so hastening the return to normality. Initiatives included mechanisms in Caribbean Catastrophe Insurance Facility, the African Risk Capacity and the Pacific Capacity Risk Assessment – financing initiatives that included collaboration with the World Bank, other regional development banks and the insurance industry.
891. Where mature insurance markets were available, the benefits that society could realize through access to insurance were products that would help build financial resilience. These were insurance programmes to provide protection against floods, hurricanes and a whole range of products and services to protect against business interruption and supply-chain failure. Insurers also provided significant underwriting and protection of critical infrastructure. Setting up innovation units and incubators to develop adaptation research and share that with the governments was an area where many countries around the world, the local reinsurance sector as well as the global reinsurance sector were supporting governments with developing better protection measures and risk-reduction solutions.
892. In the 1990s, a run of disasters (hurricanes and storms) in Europe and United States led to the bankruptcy of a number of insurance companies. It was at that time that this industry brought together its resources to support development of the field of catastrophe risk modelling. This was the latest technology in bringing information from natural hazards together with assets and their vulnerabilities to be able to assess what were the financial risks in face of a disaster. This is what enabled this industry to thrive and be able to provide more services and expand the markets for insurance around the world. Over nearly ten years ago the United Nations through the Office of UNISDR realized this tremendous capacity and with support from the World Bank, UNISDR and a number of other agencies, insurance industry capacity in risk-modelling was transferred to the public sector to enable the government to better assess risk. It also permitted more risk-informed decisions to support the various stages of prevention, preparedness, early warning and post-disaster response and reconstruction.
893. The ability of insurers to assess a disaster and pay-out faster was enabling governments to access funding through regional facilities that had been established in a number of regions. These were just preliminary results and the industry was working very closely with development partners and international donors to develop these capacities at scale. She pointed out the G-7 **Insurance Resilience Initiative** whereby the governments of the United Kingdom, Germany, Canada, and United States were working with the insurance industry, the World Bank and the UN to provide insurance solutions for the world's most vulnerable people. She mentioned some of the factors that were hindering financial protection solutions to all countries, even the most developed including limited access to risk information and risk pricing. To develop a good and effective insurance programme there was a need for access to risk information. Public policy legislative and regulatory issues related to investing in risk reduction and risk transfer capacity would need to be further developed to enable the insurance industry to operate in different regions.
894. Ms Golnaraghi drew member's attention to regulatory barriers to access global insurance and reinsurance markets in some countries. The Geneva Association worked with the CEOs of the largest



global insurance and reinsurance companies and governments to pave the way to open-up access to the global insurance and reinsurance markets to all nations. The Association had been exploring hurdles that prevented insurance capital from entering different markets. She also drew attention to studies conducted by the Global Reinsurance Forum of the Geneva Association on regulatory barriers to facilitating insurance and reinsurance solutions particularly to middle and low-income nations. These were available at www.grf.org.

895. In conclusion, Ms Golnaraghi stated that the Geneva Association was working to help all nations with their efforts to build financial and economic resilience to disasters and in that regard hoped to work on stronger collaboration and cooperation with United Nations agencies, the WTO, the development community and governments to bring forward the value proposition of this industry. This value proposition lay in the shape of better quantification of risk and development of sound financial protection measures that could help governments, people and businesses address risk and be better prepared to be able to handle the impacts of these catastrophes.

Comments from the floor

896. A representative of **UNCTAD** highlighted the organization's keen interest having worked for some time on the implications of climate change on maritime transport and transportation infrastructure throughout the supply chain. More recently, UNCTAD had undertaken further research particularly reference and emphasis on climate change impacts and adaptation to disaster risk reduction for ports and airports and small island developing states. She emphasized the importance of an integrated, holistic consideration of the implications of climate change and natural disasters on trade throughout the supply chain, also with reference to infrastructure. The Trade Facilitation Agreement was important in this regard especially for small island countries who depended on maritime transport and air transport to bring in tourism. On risk and vulnerability assessment studies, she brought attention to Caribbean Development Bank Project that had been undertaken to assist ports and airports to agree adaptation priorities. She also advocated a close collaboration
897. The **World Customs Organization (WCO)** highlighted that the guiding principles of WCO's work were achieving preparedness, awareness, communication and cooperation. In terms of preparedness, WCO had several tools available to its members, including **Recommendations of the Customs Co-operation Council (1970)**, provisions in two of WCO's conventions. The first one was the Convention on the Harmonization and Simplification of Customs Procedures, broadly known as the Revised Kyoto Convention. It had specific and special procedures, and one of the **chapters**

therein was devoted to relief consignments.

This chapter contained the facilitation measures that the contracting parties were invited to implement so that aid could reach those in need in a timely manner. The second convention was the Convention on Temporary Admission, broadly known as the Istanbul Convention, which contained an **Annex on temporary admission of equipment for humanitarian purposes**. There was also a **resolution of 2011** which invited its members to implement facilitation measures for the exportation, importation and the transit of relief items. The WCO was implementing, in cooperation with UNOCHA, a **project** funded by the Dutch government for three ebola-affected countries which aimed at preparing standard operating procedures. The procedures to be triggered and implemented in the event of a disaster included: building the capacity of the customs administrations and their stake holders to implement these standards, the operating procedures and conducting simulation exercises. The WCO had cooperated with the IFRC and many other stakeholders, and was open to cooperating with the WTO on the research project.

898. A representative from **Vanuatu** drew attention to the impact of Tropical Cyclone Pam on his country. Following up on the issue of early warning system that needs to be set up within the countries prior to a disaster, he highlighted some of the key issues that need to be addressed. He emphasized the need to work in coordination with all the agencies. He highlighted shortcomings from relying on external experts for training in Vanuatu as there was little continuity. He highlighted support that had been received from the EIF for rehabilitation of its sea wall after Cyclone Pam. He urged all Members to build capacity and resilience before disaster so as to reduce vulnerability.
899. The Permanent Mission of **El Salvador** reiterated Director-General Azevêdo's comments about the importance and timeliness of the event given that disasters were likely to occur with greater frequency and intensity as a result of climate change. She highlighted that her country had also suffered from disasters. El Salvador was regularly hit by droughts, floods and earthquakes which lead to the loss of human life and destruction. She assured Members of El Salvador's support for the continuation of these discussions at the WTO in seeking to identify measures which would assist in mitigation of the effects of disasters and increase resilience of Members to confront disasters and to promote reconstruction. All of this would be on the basis of a comprehensive approach tackling the situation faced by all vulnerable members who faced this kind of disaster.
900. The representative of **the Pacific Island Forum Secretariat** recalled Ambassador Lisson's comment that the Pacific was one of the regions that were most vulnerable to natural disasters and climate change. She referred to the World Risk Report put out by the UN University which



showed that Vanuatu and Tonga were the top two most vulnerable countries out of the 171 countries listed in that report. Within the top 15 countries, five were from the Pacific, namely, Vanuatu and Tonga, Solomon, Papua New Guinea and Fiji. Drawing from this report, she pointed out that the Pacific region was very keen to engage in these discussions, particularly to try and find the nexus between trade and natural disasters, but more importantly to look at how WTO rules could address some of the trade losses and damages that were caused by natural disasters, and the need to focus on building resilience and preparedness using existing WTO rules. Recognizing hikes in prices as a result of food shortages prompted by natural disasters, one action taken by Pacific Island Forum was to support a permanent solution for public stock holding that would support the need for some countries to stock pile food for natural disasters, so as to create food security and to stabilize the price of food after natural disasters.

901. The representative of **CARICOM** emphasized that the group attached great importance to the symposium on trade and natural disasters given how exposed the region was and how vulnerable it was to climate change in general and to natural disasters in particular. Some 165 natural disasters had affected the Caribbean between 1990 and 2008. The damage and loss that were suffered over that period had been estimated to be in the region of USD136 billion. Natural disasters had become increasingly frequent and their consequences ever worse, particularly in terms of the loss material and infrastructure damage. Climate change meant that the frequency and intensity would also increase.
902. The damage caused by Hurricanes Matthew, Irma and Maria caused to Dominica, Antigua and Barbuda in 2017 were perfect examples of the challenges faced by the Caribbean. They illustrated just how natural disasters could wipe out many years of development progress. They had a negative effect on trade in goods in services, on investment flows, and had led to high unemployment, poverty and other problems. For example, after the Islands had been struck by Irma and Maria, the United Nations estimated the economic loss to Dominica, Antigua and Barbuda at some USD 400 million dollars, with some USD 1.1 billion of total damage. In Dominica the economic impact was more than 200% of its GDP. These examples showed the extent to which the Caribbean was vulnerable to natural disasters and the need to bring comprehensive solutions to help Members rebuild and relaunch their economic growth and their development.
903. As seen in the proposal from Antigua and Barbuda, Dominica, Grenada and Kitts and Nevis, St Lucia, St Vincent and the Grenadines, in their document WT/MIN (17)/37, the multilateral trading system had to provide the necessary flexibilities to the most vulnerable members and the weakest members following natural disasters so that they can rebuild and continue their development. This was the

reason behind special and differential treatment granted to members during reconstruction periods. It allowed the measures taken to continue to comply with WTO agreements. He concluded by stating that CARICOM believed that the granting of the necessary flexibilities to WTO rules would help increase the economic resilience of those members who were highly vulnerable to natural disasters.

904. **Japan's** representative highlighted that the country was also vulnerable and had been affected heavily by natural disasters. Japan represented only 0.82% of the world's land area but 20% of the earthquakes over magnitude 6 on the Richter Scale took place there and it also had 7% of the world's active volcanos. She recalled the interventions of previous speakers who had mentioned Japan's disaster that occurred in 2011 and expressed gratitude for the level of support received from all over the world. He emphasized that Japan is a country which had been working hard not only for response, but also early warning and resilience and promoting preparedness to natural disasters. Some of the products, the fruits of their endeavours had been shared with others, including cooperation to establish early warning for tsunamis in the ocean. Japan had hosted country three UN World Conferences on Disaster Risk Reduction: in Yokohama in 1994 and 2005 in Tokyo and latterly 2015 in Sendai. He mentioned that Kobe was the place where the big earthquake took place in 1995 with over 5,000 casualties. Sendai was the area which was most heavily affected by the tsunami in 2011. He looked forward to further collaborations in the discussions in the WTO.
905. A representative of the **European Union** registered how shocking it had been to hear the statistics and the facts and figures on disasters. She called for collaboration between different actors who saw the different dimensions of things and understood and knew the reality of disaster recovery reaction resilience as it was clearly very complicated.
906. The **UN Environment Programme** commended the WTO for its initiative and expressed their interest from a UN environment side to work very closely on this endeavour.

Information Session

907. **Michael Roberts, Head of Aid for Trade Unit, Development Division**, welcomed the presentations and comments made by WTO Members and fellow international organizations. He then outlined how the proposed research on natural disasters and trade would be taken forward. A first stream of work would examine trade effects, looking at goods and services, while a second thread of work would look at mapping legal instruments. The research would be framed through the prism of trade effects and issues arising in disaster response, disaster recovery and disaster resilience. A structured questionnaire would also be circulated to Members



and organizations involved in this area. The responses would be compiled and analysed as part of the research. The information collected in the two reports would then be synthesized down into an overview or issues report that would be launched at the end of the first quarter of 2019. He concluded by stating that the WTO was keen to work with all those who had manifested an interest and would welcome ideas, suggestions and proposals from all stakeholders.

Disclaimer: This is an informal report of the Symposium prepared by the WTO Secretariat. The opinions expressed are not intended to represent the positions or opinions of the WTO or its members and are without prejudice to members' rights and obligations under the WTO.



SYMPOSIUM 2

On 14 December 2018, a second **Symposium** surveyed hazards, risks and losses from natural disasters and outlined the economic case for investing in resilience. Also discussed was a preliminary scoping of issues arising from the WTO research.

Session 1: Surveying losses, hazard and risk from natural disasters

Moderator: Shishir Priyadarshi, Director, Development Division

- Introductory Remarks: **Simon Farbenbloom**, Minister, Deputy Permanent Representative to the WTO, Australia

Speakers:

- "The impact of disasters on agriculture and food security" – **Wiryia Khim**, Natural Resources Officer, Climate Change Adaptation and Disaster Risk Reduction, United Nations **Food and Agriculture Organization**
- "Overview of Economic Losses, Poverty & Disasters 1998-2017" – **Denis McLean**, Head of Communications, United Nations Office for Disaster Risk Reduction
- "Current and future disaster risk – a scientific perspective" **Tom de Groeve**, Deputy Head of **Unit**, Joint Research Centre, European Commission (by video link)

Question and answer session

Session 2: The economic and trade case for investing in resilience

Moderator: Michael Roberts, Head, Aid for Trade Unit, Development Division

Speakers:

- "Using catastrophe risk models to optimize supply chains" – **Robert Muir-Wood**, Chief Research Officer, RMS
- "Making the economic case for investing in risk reduction and resilience" – **Michael Szoenyi**, Programme Lead, **Flood Resilience Program**, Zurich Insurance Company
- "The Global Weather Enterprise Supporting Sustainable Development", **Dr David Rogers**, Meteorological Consultant, **Global Facility for Disaster Reduction and Recovery**

Question and answer session

Session 3: Preliminary scoping of issues arising from WTO research

Speaker:

- "Preliminary overview of issues arising" – **Michael Roberts**, Head, Aid-for-Trade Unit, Development Division, WTO



Session 1: Surveying losses, hazard and risk from natural disasters

908. **Shishir Priyadarshi, Director, Development Division** welcomed participants by highlighting that the event was an intermediate mid-term step in the work on natural disasters and trade. A wrap-up event would be held in April 2019 to share the results of the work. A first symposium had been held in April 2018, at which Dominica and Nepal, both of which had suffered natural disasters, had given illuminating presentations. Those presentations highlighted two aspects of the WTO research work: what needed to be done on the domestic front in terms of facilitating the entry of relief materials and workers. The second aspect looked at what needed to be done multilaterally. At the first symposium, the Secretary General of the International Federation of the Red Cross and the Red Crescent (IFRC) had stated that there was need to re-establish market opportunities as soon as possible after a disaster. The United Nations Office for Disaster Risk Reduction (UNISDR) was also contributing to the WTO research in the context of the Sendai Framework for Disaster Reduction – part of the United Nations' (UN) 2030 compact. A working relationship had also been established between the WTO and the World Customs Organization (WCO), particularly on the WTO's Trade Facilitation Agreement which was playing a crucial role in facilitating and expediting goods post-disaster and in the preparedness of it. Mr Priyadarshi thanked the Government of Australia for their support for the research work.
909. **Simon Farbenbloom, Minister, Deputy Permanent Representative of Australia** reaffirmed Australia's support towards this WTO research project. He recalled working as a permanent representative to UNESCAP in Bangkok where he had worked on disaster risk reduction issues. Coming back to Geneva, he noted that there were few forums for officials and members of international organizations to brainstorm on such issues and commended the WTO for taking this initiative. The Government of Australia was pleased to support work on an issue that would be of great relevance to the WTO and all its Members.
910. Natural disasters and trade were a topic of interest to Australia for many reasons. Like many Members, Australia was highly exposed to natural disasters. In a ten-year period ending 2016, the economic cost of natural disasters had averaged approximately US\$18 billion per year, representing about 1.2% of its GDP. With climate change, population growth, and urbanization, losses were expected to increase. He explained that the Pacific was the most disaster-prone region, a reality which gave Australia a unique perspective on the importance of building resilience. Working with countries to increase resilience to natural disasters was a key component to the Government's official development assistance (ODA). Australia was working with international partners such as the IFRC and various UN agencies in preparing for and responding to natural disasters.
911. From a policy perspective, Mr Farbenbloom explained that there appeared to be little work done to date on the links between trade and natural disasters. He mentioned that increasing a country's disaster resilience had important benefits for its capacity to trade, and that strengthening a country's trade regime before a natural disaster struck would increase resilience. He expressed confidence that the WTO research would provide useful insights and policy ideas to support engagement in the natural disasters and trade topic.
912. **Wirya Khim, Natural Resources Officer, Climate Change Adaptation and Disaster Risk Reduction, Food and Agriculture Organization (FAO)** explained that agriculture was particularly vulnerable to natural disasters. FAO had produced reports in 2015 and 2017 on the impact of disasters on agriculture and food security as part of FAO's commitment to contribute to the Sendai Framework. Through the reports, FAO aimed to provide a clearer understanding of disaster impacts to develop better risk reduction-informed policies and investments in resilience building. Noting that the impacts of disaster on agriculture remained poorly documented and under-analysed, the reports would help fill a knowledge gap. The reports would also help provide more evidence in building the economic case for investment in the agriculture sector. With these reports, FAO hoped to provide updated and systematic data analysis on the damage and losses to help states meet their commitment to the Sendai Framework and the Sustainable Development Goals (SDGs).
913. FAO's 2015 disaster impact report had found that only 4% of total ODA was spent on agricultural assistance in the period 2012-2013. Between 2003-2013, roughly about US\$121 billion was spent on humanitarian assistance for all types of disaster and crises. However, only 3.4% was directed to the agriculture sector, which was less than the UN target of 10%. The report reaffirmed that the economic impacts of disasters on agriculture were not well-documented, nor well-analysed due to a lack of data and methodological constraints. The 2017 report had considered impacts, not only on crops and livestock, but also on forestry, fisheries and aquaculture. The report had placed special emphasis on conflict, with a dedicated chapter on agricultural production in Syria. The 2017 report had improved analysis of disaster impacts using macroeconomic analysis of trends in crop and livestock production yields from the FAO Stat, EM DAT CRED database and damage and loss analysis included in post-disaster needs assessments (PDNAs).
914. An average of 260 natural disasters had occurred annually over the period 2005-2016 at an average annual cost of US\$27 billion in economic losses. About 23% of total economic damage and losses



were registered by the agriculture sector. In monetary terms, the total production loss in Asia had been calculated at US\$48 billion, followed by Africa at US\$26 billion, and Latin America and the Caribbean at US\$22 billion. Globally, natural disasters destroyed approximately 4% of total production. Ms Khim highlighted that the figures were significant because production disruptions of such magnitude could have severe impact on international markets and affect global food supply.

915. At a regional level, in West Africa, total production losses recorded were highest, at more than 10% of total production, followed by the Caribbean and Western Asia and Polynesia. Over the period 2005-2015, drought had caused 30% (US\$29 billion) of agricultural loss. Floods caused 20% (US\$19 billion) of the cumulative production loss in crops and livestock. Other meteorological disasters such as extreme temperatures and storms costed about 28% (US\$ 26.5 billion) of the overall production loss. Biological disasters such as disease and infestation accounted for about 10% of the total loss.
916. Drought accounted for the majority of losses in Latin America and Africa. In Asia, floods and storms were the disasters responsible for most agricultural production losses. In Africa, crop pests and animal disease were among the costliest disasters in the region accounting for over US\$6 billion in agricultural loss between 2005-2015. In Asia, alongside floods, agriculture systems were equally confronted by earthquakes, tsunamis and extreme temperatures which affected over US\$9 billion and US\$7 billion loss respectively.
917. In Asia, disaster-related production loss was high across all the commodity groups. Cereal production stood out with a cumulative loss of about US\$4 billion over the past decade. Disasters in Asia also had a serious impact on fruit and nut production with a total loss of US\$7.3 billion, followed by livestock production with a loss of over US\$6 billion and vegetable production with a loss of about US\$5 billion.
918. The FAO report also considered the impact of disaster in Small Island Developing States (SIDS). In monetary terms, agriculture sector losses were lower in SIDS than in non-SIDS countries, about ten times lower. In relative terms, the agriculture damage and losses in SIDS represented a substantial share of the sector's GDP. On average, the damage and loss caused by a single disaster in agriculture sector corresponded to about 19% of the agricultural value added in SIDS compared to 8% of the non-SIDS countries. Furthermore, disasters in SIDS affected a larger proportion of the population. On average 18% of the total population was affected by a disaster that hit a SIDS as compared to 2% in non-SIDS countries.

919. The **2017 report** also brought together a more holistic approach to FAO's damage and loss

methodology that, for the first time, added the forestry, fisheries and aquaculture sectors to the analysis. The report also covered new ground. It focused on transboundary animal disease. The pest-petit ruminant (PPR) transboundary animal disease alone caused an estimated US\$1.45-2 billion each year in production losses. The report also looks at the Rift Valley Fever outbreak that impacted and interplayed with other natural hazards. In terms of the conflict and protracted crises, the FAO report measured the damage and loss in the agricultural sector in Syria by adopting a specific methodology for the damage and loss assessment in conflict using very innovative methodology for data collection.

920. FAO methodology had been fully incorporated and integrated into the Sendai Framework monitor and was used to support the SDG monitoring indicator for goal 1.5.2 (i.e. direct economic loss attributed to disasters in relation to global gross domestic product). This methodology provided a very holistic presentation of the agriculture sector which covered all the subsectors including crop, livestock, fisheries, forestry and aquaculture. The methodology itself had been tested in two countries, in two different types of disasters, the drought in Ethiopia and Typhoon Haiyan in the Philippines. The methodology had been used to monitor the target C of the Sendai Framework for Disaster Risk Reduction on agricultural losses from disasters.
921. Disaster risk reduction management needed to be systematically embedded in the agricultural sector and sub-sectoral development plans and investment for countries that were facing recurring hazards and for countries where the population depended on the agriculture sector. More financial resources needed to be directed at the agriculture sector in developing countries, by national governments, private sector and development actors in a manner that was more consistent with the sector's crucial role in eradicating hunger and achieving food security. In turn, this would contribute to sustainable agricultural development and economic growth. Humanitarian aid to the agricultural sector should better reflect the impact of disasters on the sector itself. Furthermore, national governments and the international community should establish targets for financing disaster risks in the agriculture sectors to reduce disasters and to prevent the creation of new risks.
922. There was also need for continued improvement of data and knowledge on disaster impacts on the agriculture sector. This entailed the improvement of local level data and information systems, damage and loss data collection and analysis at country level, national and subnational level. So-called "silent disasters" such as slow-onset events also needed to be captured in data sets because localized disasters were often unreported, yet they had big consequences for rural livelihoods. There was a need to continue to strengthen and build capacity and forge partnerships with all the key actors



involved. This included by establishing and working on the improved mechanisms and resources for data collection management analysis. She called for support for national statistical offices, natural disaster risk management agencies and ministries of agriculture to build their capacity to be able to collect and report the damage and loss from disaster in the agriculture sector.

923. **Denis McLean, Head of Communications, United Nations Office for Disaster Risk Reduction**

focused his presentation on the Sendai Framework for Disaster Risk Reduction. It had taken three years of consultations and another three years for members to agree on the indicators for the seven targets of the Sendai Framework. In March 2018, UNISDR had launched the Sendai Framework monitor – a global initiative to improve how losses were measured.. The first two Sendai framework targets related to mortality from disaster events. In recent years mortality from disasters had declined in many parts of the world due to much improved disaster preparedness and better early warning systems. Remarkable progress had been seen in Bangladesh and India. Great progress had also been made in bringing down mortality and reducing the numbers of affected people, which was target 2 of the Sendai Framework. That said, the number of people affected by extreme weathers was on the rise.

924. The most challenging of the Sendai targets was, 'helping to reduce economic losses as a percentage of GDP'. UNISDR was collaborating with CRED to measure the impact of economic losses. CRED maintained a global database on the impact of disasters. **UNISDR's Report** showed that extreme weather events accounted for 91% of recorded disasters worldwide. In addition, over the last 20 years, economic losses from these events were in the region of US\$3 billion worldwide and 77% of that came from extreme weather events. This figure was also growing. He emphasized the need to enhance international cooperation to help LDCs, SIDS, and other lower-income countries, which suffered most from these losses.

925. In terms of the largest absolute economic losses, these had been incurred in the USA, which had endured a record 16 disasters, each costing over US\$1 billion in 2017. Other countries that had incurred large economic losses by value included Japan and China. Looking at the economic losses through the lens of percentage of GDP, the picture was different. Countries like Haiti, Tajikistan and many countries in Africa were continuously losing a high percentage of their GDP every year to extreme weather events, and agriculture was disproportionately affected. The most surprising thing about the report was the fact that there was no reliable economic data on losses for 63 percent

of all recorded disasters in the CRED database. For over 7,000 events recorded over the last 20 years, reliable economic data was only available for less than 40% of those events. Better captured data would help member States understand losses and take action to improve disaster risk reduction.

926. For low-income countries, economic data was only available for 13% of the disasters which had been incurred in the last 20 years. A lot of work had to be done to support these countries do a better job of: (a) measuring their losses, and (b) helping them to operationalize strategies at national and local levels to reduce their losses.

927. **Tom de Groeve, Deputy Head of Unit, Joint Research Centre, European Commission**

gave a scientific perspective on disaster risk reduction focusing on the work of the Joint Research Centre (JRC) that had been established in 2015 to help policy makers with risk-informed decision-making processes. He highlighted recent extreme weather events including floods in Italy, wildfires in the USA and Europe, Ebola in Congo, all of which had had devastating economic impacts. JRC was working, in collaboration with other international actors, to capture scientific data behind extreme weather occurrences. It took scientific knowledge and translated it into the context needed to help policy-makers make informed decisions.

928. The JRC was working with UNISDR on a Global Risk Assessment Framework to generate more knowledge and understanding at a global level.³⁸¹ Mr de Groeve also highlighted the Disaster Risk Management Knowledge Centre and efforts towards making scientific knowledge more widely available.³⁸² He highlighted the first global earthquake model which had been the outcome of ten years work with different countries and technological organizations to try and bring the best knowledge about earthquake risks into one coherent, consistent framework.

929. Key drivers of risk were climate and other hazards, on one hand, and changes in exposure and vulnerability on the other hand. On exposure to risk, JRC had conducted research which involved more than ten years of earth observations through satellites and artificial intelligence. The research showed that as population grow and buildings increased, they became exposed to risk. Additionally, the concentration of people and buildings along coastal lines created or increased risk. JRC raised awareness on such issues as it would be useful for policy making. Measuring and verifying vulnerability over time was a way of building resilience. The INFORM Global Risk Index, a multi-stakeholder project between the European Commission, UN agencies and donor

381 Global Risk Assessment Framework: <https://www.preventionweb.net/disaster-relief/graf>.

382 Disaster Risk Management Knowledge Centre: <http://drmkc.jrc.ec.europa.eu/>.



agencies provided a better understanding of risk vulnerabilities.³⁸³

930. In **IPCC** reports, climate scientists had modelled different scenarios, including what would happen if global warming was limited to below 1.5 degrees Celsius and an alternate scenario of less than 2 degrees Celsius. Given the risks that would arise, there was need to focus on adaptation. A recent JRC publication quantified coastal risks and showed that sea level rise and other extreme weather events would lead to increased risks, both in expected damage and losses. Risks were also quantified in economic terms. For instance, the EU suffered losses worth €217 million annually from heatwaves and these figures were expected to go up to €10 billion annually. Critical infrastructure would also be affected. Mr de Groeve also highlighted that risk was systemic and interconnected. For instance, if a port was destroyed, there would be knock-on effects on transport and employment systems. The JRC was looking at building resilience to capital, that is, natural, human, social and built capital.

Question and answer session

931. **UNCTAD** noted their participation at the COP 24 meetings in Katowice and highlighted that UNCTAD had been working in collaboration with JRC on issues of climate change impacts and adaptation for coastal transport infrastructure. UNCTAD had been conducting technical assistance projects with various island states on these issues.
932. **UNECE** stated that they had been working on disaster risk reductions and highlighted a recent publication on the transboundary impact of technological disasters. UNECE had also developed standards for business continuity and how to mainstream risk-based approaches in policymaking.
933. **Jamaica** appreciated FAO's presentation and stated that there was a gap in both knowledge and data. They recognized that for SIDS, the quantum and percentage of the economic losses were significant. In the case of Jamaica, hurricanes and droughts had cost the country an average of 2% of GDP between 2001-2012. This figure would grow to 56% of Jamaica's GDP by 2025 due to climate change. Jamaica was ready to collaborate with other international actors to better define the economic impacts of these disasters.

Session 2

934. **Robert Muir-Wood, Chief Research Officer, RMS** began his intervention by giving an overview of disaster risk modelling. Established 25 years ago, RMS created synthetic datasets used by insurers and reinsurers around the world to price, measure and monitor risks. These models existed for risks

including earthquakes, hurricanes and floods. The framework for developing risk models involved breaking risk down into sub-sets of hazards (such as extreme weather events), and examining the impact of each event at different locations on the ground. Researchers then identified exposure hazards and calculated damage. In calculating damages, they also factored in business downtime. By calculating the variable of business downtime, catastrophe risk modelling linked both to insurance and catastrophe modelling for supply chains. He explained the approaches to calculating risks through expected probability (which demonstrated risk through severity and frequency) and loss.

935. Exposure to recent critical events had provided a great deal of information on supply chain risks. In Thailand, large industrial estates had been built on flood plains, where land was both available and cheap. In 2011 flooding had taken these facilities off-line for between four to nine weeks. More than 7,000 industrial manufacturing plants had been affected. Many of these manufacturing plants were integrated into global value chains with significant disruptions to supply as a result.
936. Another example Mr Muir-Wood cited was that of a company that manufactured Xirallic paint. It was the sole manufacturer of a pearl-lustre pigment paint that made cars sparkle. The manufacturing plant for Xirallic had suffered damage during the March 2011 Japan Earthquake. Compounding the damage was the fact that the factory was situated in the initial radiation exclusive zone. As such, the factory was inaccessible until radiation levels stabilized and people could safely access the site to repair the damage. The halt in production had had an impact on a wide range of manufacturers who relied on this paint, including big car manufacturing companies that had to cease temporarily the production of certain colours for cars due to this event. Production had resumed in May 2011 and the backlog was only cleared by September.
937. When developing a risk model for customers, RMS examined supply chains to identify risks and advised how to build in resilience. Based on where manufacturers were located, they were able to determine across a wide range of possible disaster scenarios what impacts would be felt and the critical drivers for the restoration of production at these facilities. Noting that it was impossible to get rid of risk completely, it was nevertheless possible to minimize the impacts of hazards on facilities and to reduce the time that facilities were off-line. Mr Muir-Wood emphasized the need for companies to incorporate risk. The economic cost associated with down-timing would help achieve such objectives, especially for supply chains.
938. **Michael Szoenyi, Programme Lead, Flood Resilience Program, Zurich Insurance Company**

383 INFORM Global Risk Index: <https://drmkc.jrc.ec.europa.eu/inform-index>.



- stated that every US\$1 invested in resilience would return US\$5 in economic benefits. A lot of investment had gone into response and recovery, but there was a need to shift the focus to ex-ante resilience building. A large proportion of the enabling infrastructure for trade and supply chains was not insured and would probably not be insured in the future. Supply chains and trade enablers like port infrastructure would not return to levels of economic activity registered prior to an extreme event. For example, before the 1995 earthquake, Kobe port had been the biggest port in Japan. After the earthquake hit, supply chains had been disrupted. Recovery had taken longer than expected and more than ten years later, levels of activity at the port had only reached 85% of 1995 levels.
939. One of the main challenges that Mr Szoenyi perceived was that risk management was viewed as an economic cost to business. Most companies failed to include into their cost calculations the full risk of a specific hazard. This oversight needed to be corrected in his view. He also emphasized the need to support risk-informed decision making in any kind of trade-enabling infrastructure.
940. In 2012, the Zurich Resilience Alliance had been created through a multi-sectoral collaboration. The program focused on practical bottom-up ways to work directly with communities at risk from floods, focusing on the most vulnerable and the most marginalized communities, both in developed and developing countries alike, to strengthen their resilience to flood risk. The Alliance had been created through social, political and financial investments in these communities. The program's success was attributed to partnerships with humanitarian agencies, academia and civil society as well as the private sector. The program had 225,000 beneficiaries. By establishing a resilience measurement framework, one million data points had been created in over 13 countries. The data generated translated into knowledge sharing about flood risk and resilience and was also conducted as part of the program's activities.
941. While hazards were natural, disasters were man-made in Mr Szoenyi's view. Zurich Insurance Company provided learning tools that would help communities understand why flooding events had grave consequences, the knock-on effects that were reported as unexpected or unprecedented and the unpredictability of such events. Zurich Insurance Company used two models to build a resilience building measurement framework known as the 5C-4R framework. The first model contained five elements of capital which built an axis on how to look at resilience. The second model used the four properties of a resilience system which came from engineering infrastructure systems, but could also be used in the social systems.
942. Investing ex-ante was difficult due to revenue impacts, budget constraints and political cycles. Ex-ante resilience measures included land zoning and building codes. In his view, there was a need for the insurance industry to go beyond simply selling insurance products and to start providing risk awareness and resilience services. He called on all Members to combine financial flows and risk informed development. He made the case for developing resilience bond instruments that could be traded in the financial markets.
943. There was a huge gap between the insured losses and uninsured losses, also known as the "protection gap". Under current assumptions of population growth, urbanization and climate change, there was a risk that floods and other natural hazards might become uninsurable. The insurance industry often focused on a classic "policy for premium" approach. However, once damage level exceeded the capacity of the sector to risk pool, then these hazards became uninsurable. As such, there was a need to explore a "non-traditional" role for insurance to make (residual) risk insurable by supporting disaster risk-reduction initiatives.
944. **Dr David Rogers, Meteorological Consultant, World Bank Group** focused his presentation on the Global Weather Enterprise (GWE). Forecasting weather was an important tool for early warning systems. Dr Rogers explained the change in approach that had occurred in meteorological forecasting towards an approach that sought to predict "what the weather would do", not "what it would be" at any given moment. This change in approach supported ex-ante action to prevent risks and to build resilience given that weather risks accounted for most economic damage. The GWE consisted of three important components: (1) the public sector which included national meteorological services; (2) the private sector, firms such as AccuWeather; and (3) academia, which played a crucial role in research and development.
945. Both the public and private sector agreed that their goal was to contribute towards sustainable economic growth and to contribute to the achievement of 10 of the 17 SDGs. To support these policy objectives, the GWE would have to grow tenfold in 10 years (from a US\$50 billion industry to a US\$500 billion industry) in order to meet the SDGs.
946. Significant investment had been made by the private sector in meteorological services. Scientific and technological innovation meant that the GWE was now able to provide information at a local level, enabling people to make risk-informed decisions. He expressed the need for people to embrace probabilistic information rather than deterministic solutions. In addition, as explained, significant international financing had been made towards national meteorological services, but this was not sufficient to meet global requirements.
947. Another issue raised by Dr Rogers was protectionism generated by perceived competition between the public and private sector in providing



weather services. In some jurisdictions, weather observations by organizations other than the national meteorological service were illegal. Additionally, there was innovation in terms of the services that could be offered due to new data sets and improved data forecasting. Data was not always readily available to the private sector with governments limiting or preventing access altogether. Low and middle-income countries were missing out on services that could inform their disaster mitigation measures. Regulation of the GWE was still nascent. Provision of meteorological services by the private sector was outlawed in some countries. International service providers remained untaxed and thus did not contribute to revenue at the national level.

948. Investments in meteorological service provision were widely different when measured in terms of per capita of national population (from US\$3.50 to US\$0.25) and this contributed to the inability to act effectively in the face of natural disasters. Where major investments in meteorological services had been made, they often were not sustained. He urged WTO to examine guidance on the rule making for GWE. Dr Rogers drew attention to a forthcoming GWE forum [meetings](#) in April 2019 and encouraged WTO to engage in the deliberations.

Question and answer session

949. **UNEP** affirmed the need to adopt holistic approaches to risk. It was important to fully incorporate environment policies into risk approaches as part of resilience-building strategies and responses to natural disasters. The speaker also highlighted a joint publication authored by the WTO and UNEP which looked at how trade could create environmental sustainability and build resilience.
950. **Barbados** pointed out that lack of concessional financing prevented Small Vulnerable Economies (SVEs) and SIDS from investing in critical infrastructure. He expressed the need to address capacity gaps in SIDS and SVEs.

Session 3

951. **Michael Roberts, Head, Aid for Trade Unit, Development Division**, provided an overview of the topics arising from a preliminary scoping of issues arising from the on-going WTO research. He noted that the research work did not seek to define natural hazards. The research instead focused on specific hazards: geophysical and meteorological. In addition to discussing the trade effects of natural disasters, the research used a three-pronged approach that discussed trade issues arising in disaster response, recovery and resilience. He outlined the trade impacts of disasters (trade destruction, creation and diversion), how the efficiency of global production networks made them susceptible to events arising, and trade issues arising in response, recovery, resilience including. SPS, TBT, Trade Facilitation, waivers and other issues). He alerted Members to a conference that would take place in April 2019 at which the country research results would be presented.

Disclaimer: This is an informal report of the Symposium prepared by the WTO Secretariat. The opinions expressed are not intended to represent the positions or opinions of the WTO or its members and are without prejudice to members' rights and obligations under the WTO.



SYMPOSIUM 3

On 10 May 2019, a third **Symposium** was held at which research was presented that examined the economic and trade impacts of natural disasters on six recently disaster-affected Members (Dominica, Fiji, Nepal, Saint Lucia, Tonga and Vanuatu). At the Symposium, the research was validated by representatives of the Members concerned.

Session 1: Opening of the symposium

- Yonov Frederick Agah, Deputy Director-General, World Trade Organization

Session 2: Taking resilience forward – engaging the trade community in disaster risk reduction

Moderator: Shishir Priyadarshi, Director, Development Division, WTO

Keynote speakers:

- Bradley Felix, Minister of Commerce, Industry, Enterprise Development and Consumer Affairs, St Lucia
- Kirsi Madi, Director, United Nations Office for Disaster Risk Reduction
- Frances Lisson, Ambassador, Permanent Representative of Australia to the WTO
- Jaime Chissano, Minister Plenipotentiary, Permanent Representation of Mozambique to the WTO

Question and answer session

Session 3: Presentation of country research results

Moderator: Giovanna Adinolfi, Professor, University of Milan

Overview of research results:

- Michael Roberts, Head, Aid-for-Trade Unit

Comments and reactions:

- Madhu Kumar Marasini, Joint Secretary, Head of Multilateral Trade and Trade Cooperation, Ministry of Industry, Commerce and Supplies, Nepal
- Matthan Walter, Director of Trade, Ministry of Trade, Energy and Employment, Dominica
- Roy Mickey Joy, Ambassador, Director General, Ministry of Tourism, Trade, Industry, Commerce & Ni-Vanuatu Business
- Esterlina Kautoke 'Alipate, Senior Trade Officer, Trade Division, Ministry of Trade and Economic Development, Tonga
- Vueti May, First Secretary, Permanent Mission of Fiji to the WTO

Question and answer session

Session 4: Next steps

Speaker: Michael Roberts, Head, Aid-for-Trade Unit



Overview

952. On 10 May 2019, a third Symposium on Natural Disasters and Trade was held at WTO. It focused on validation of country research work undertaken by the WTO Secretariat examining the experience of six recently disaster-affected Members (Dominica, Fiji, Nepal, Saint Lucia Tonga and Vanuatu). The research examined the macroeconomic impact of natural disasters on the affected countries, and trade issues arising in disaster response, recovery and resilience. The reports can be consulted using the following hyperlinks:

- [Summary of findings](#)
- [Nepal study](#)
- [Caribbean study \(focusing on Dominica and Saint Lucia\)](#)
- [Pacific study \(focusing on Fiji, Tonga and Vanuatu\)](#)

Session 1: Opening of the symposium

953. Yonov Frederick Agah, Deputy Director-General, WTO opened the Symposium by recalling that the catalyst for this research work was the devastation suffered by the Eastern Caribbean in 2017. The damage inflicted by the passage of Hurricanes Irma and Maria became the subject of discussion, both in the General Council and at the last WTO Ministerial Conference. He further noted that an increasing number of Trade Policy Reviews was also capturing the impacts of natural disasters. Regrettably, such events kept happening and inflicted a high level of human and economic costs. He noted that urbanization was a risk factor. Climate change was also making extreme events more frequent and severe.

954. Absent to date was a systematic attempt to understand the nexus between natural disasters and trade. This was the objective of the on-going research work being funded with the support of the Government of Australia. Deputy Director-General (DDG) Agah highlighted that the studies being discussed at the Symposium focused on: the macroeconomic and trade impact of natural disasters, and the trade issues arising in the context of disaster response, recovery and efforts to reduce risk and promote resilience. One message that he urged participants to take away was that much more needed to be done to mitigate the economic and trade effects.

955. The macroeconomic and trade impact of natural disasters could be considerable, particularly when the economy affected was small and focused around a few key activities. Trade issues clearly also arose in the context of disaster response, recovery and efforts to reduce risk and promote resilience. Furthermore, many of these trade issues were very

familiar for trade negotiators and policy makers. Examples included changes in a disaster-affected Member's sanitary or phytosanitary status, how to speed up the border clearance of goods and how best to support farmers when faced with drought or flood damage. In these circumstances, what was new was not the issues *per se*, but rather the context in which they were framed i.e. that of natural disasters.

956. Discussing why the research was both timely and it mattered, he recalled that the United Nations Office for Disaster Risk Reduction would organize the [Global Platform on Disaster Risk Reduction](#) on 15-18 May, 2019. The focus of the event would be the implementation of the [Sendai Framework](#) for Disaster Risk Reduction. In DDG Agah's opinion, there was much that the WTO could do from a trade perspective to contribute to these processes. Notably, WTO could contribute its understanding of how and why the trade issues it deals with on a day-to-day basis matter in the context of dealing with, recovering from, or preparing for disasters. In this context, he highlighted that previous Symposiums on this topic had highlighted that natural disasters were predictable or emanated from known risks. Trade could be used as a tool and play an effective role to recover from or prepare for disasters. In closing, DDG Agah suggested that the research work was an *aide-memoire*. It can help develop a road map towards a better management of the linkages between disasters and trade, including developing adequate and efficient risk assistance.

Session 2: Taking resilience forward – engaging the trade community in disaster risk reduction

957. In his keynote remarks, Bradly Felix, Minister of Commerce, Industry, Enterprise Development and Consumer Affairs, Saint Lucia stated that the symposium came at an opportune time when Heads of International Organizations were in Geneva to track the progress of the implementation of the Sustainable Development Goals (SDGs). In that context, the Organisation of Eastern Caribbean States, of which St. Lucia is a member, was particularly interested in hearing about progress on SDG 13 – climate action. He noted that while preparing his remarks, Cyclone Fani had struck North-Eastern India and Bangladesh and that Cyclone Idai had hit Southern Africa, killing hundreds and displacing thousands more in Mozambique, Malawi and Zimbabwe.

958. The Caribbean region was no stranger to natural disasters. The region was prone to hurricanes, earthquakes, sea level rise, floods, landslides and volcanoes. The Caribbean was one of the most disaster-prone areas in the world. The six-member countries of the Eastern Caribbean Currency Union ranked among the top ten most disaster-prone countries in the world when considering disasters per land area or by percentage of population.



959. During the 2017 Atlantic Hurricane Season, Hurricanes Irma and Maria had caused havoc across the Caribbean, with the latter in particular causing near unprecedented destruction on the island of Dominica. Losses for Dominica as a result of Hurricane Maria were estimated at 240% of Gross Domestic Product (GDP). St Lucia's sister island of Barbuda was hit by Hurricane Irma which had transformed the verdant and unspoilt island into a vast wasteland.
960. According to the International Monetary Fund, exposure to disasters had important macroeconomic effects on small states such as Saint Lucia, resulting in lower investment, lower GDP per capita, higher poverty, and a more volatile revenue base. Natural disasters posed an existential threat to the economy, quality of life, infrastructure and very existence. Against this background, Minister Felix commended the WTO for convening the symposium. In his opinion, it confirmed that the multilateral trading system had a major role to play in building resilience for disaster risk reduction.
961. Trade could come to a complete standstill if critical infrastructure such as airports and seaports, roads, bridges and factories were destroyed or severely compromised by a natural disaster. In the digital age, natural disasters could negatively affect infrastructure critical to connectivity. In turn, this could lead to chronic shortages of food, medicines and other vital supplies. Natural disasters affected productivity as they disrupted the effective discharge of the factors of production. The picture he painted was that natural disasters can and do have a debilitating effect on trade.
962. Minister Felix also cautioned that we must not lose sight of the fact that trade also negatively impacted on the environment. According to the Organisation for Economic Cooperation and Development, economic growth resulting from trade expansion could have a direct impact on the environment by increasing pollution or degrading natural resources. In addition, trade liberalization could lead to specialization in pollution-intensive activities by some countries – a phenomenon known as the pollution-haven hypothesis. There was wide acceptance in the scientific community that this type of pollution contributed to climate change and extreme weather events. These events had implications for small states in terms of the impact on vital economic sectors, notably tourism, agriculture and fishing. One hurricane lasting eight hours could erode decades of economic progress.
963. At the last Ministerial Conference in Buenos Aires, a proposal had been tabled by some disaster-prone countries seeking special and differential treatment allowing developing countries to deviate from GATT obligations to reconstitute industrial capacity destroyed or compromised as a result of natural disasters. Although the proposal did not
- enjoy consensus, it had started a discussion on the need to tackle some of the challenges facing many of the prone-disaster countries.
964. Minister Felix argued that to address the damage already caused, and to mitigate losses from future disasters, United Nations Small Island Developing States should pursue joint efforts through relevant multilateral fora such as the United Nations Framework Convention on Climate Change, the WTO, the World Bank and the International Monetary Fund. These efforts should be directed at securing an international settlement that would meaningfully address the systemic risks that climate change and resultant disasters posed to small states.
965. As a complement to multilateral action, official development assistance provided by both traditional and non-traditional partners should also focus on building resilience in small states. More specifically, Minister Felix recommended that small states should work in tandem towards the following objectives:
- ensuring that the targets set under the Paris Climate Accord were met;
 - holding the international community accountable to meet Goal 13 of the SDGs which called for urgent action to combat climate change and its impacts. In this regard, developed countries in particular were encouraged to make progress towards the goal of jointly mobilizing US\$100 billion annually by 2020 to address the needs of developing countries in the context of meaningful mitigation actions.
 - strengthening and scaling-up disaster risk insurance such as the Caribbean Catastrophic Risk Insurance Facility; and
 - securing concessionary finance through the international financial institutions to strengthen resilience and assist small states to adapt to climate-related threats and recover from natural disasters.
966. Internally, the sustainable development strategies of small states had to focus on increasing their capacity to counter and withstand natural disasters.
967. Kirsi Madi, Director, United Nations Office for Disaster Risk Reduction stated that she was encouraged by the interest shown in exploring the links between trade, disaster risk reduction, and resilience. In her view, the WTO research was both a timely and urgent initiative as change was taking place to the global risk landscape more quickly and surprisingly than previously thought possible. Understanding the rapidly changing risk landscape, adapting and developing comprehensive policy frameworks, standards and regulation was essential to address the cascading



and interconnected nature of risk. The WTO had a role to play in this regard.

968. Ms Madi stated that the private sector was also recognizing this changing risk landscape. A **recent study** by Blackrock, the worlds' biggest asset manager, highlighted that the majority of its investment was currently made risk blind and that better climate and disaster risk assessments were needed to ensure sustainability of our systems. She recalled that the Sendai Framework required the public and private sector to work hand-in-hand to ensure that hazards and risks were fully internalized into investment decisions, including through regulatory frameworks that incentivized resilient investment. In this regard, she argued that the sixth session of the Global Platform for Disaster Risk Reduction from 13-17 May 2019 would be a milestone.
969. The Global Platform would take stock on where governments stand in implementing the Sendai Framework, including the development of national and local disaster risk reduction (DRR) strategies and plans by all countries by 2020 as to Sendai target (e). The outcomes of the Global Platform would in turn feed into the High-level Political Forum on Sustainable Development in July where progress on implementing the SDG 13 would be reviewed and the United Nations Climate Summit, High-Level Dialogue on Financing for Development and SDG Summit in September.
970. Ms Madi identified the need to reduce economic losses, as required by Sendai Target (c) and (d), as a critical element to 'make or break resilience'. The **2019 Global Assessment Report on Disaster Risk Reduction** underlined that risks could not be treated in isolation or outside of their socioecological and socioeconomic contexts. The WTO research highlighted that trade issues were among the issues that needed to be considered.
971. In conclusion, Ms Madi recalled that through the Sendai framework, signatories had agreed to urgently reduce economic losses caused by disasters. This could only effectively be done through an *ex-ante*, comprehensive multi-hazard approach that considered all elements of socio-economic development and resilience. As the WTO research findings underlined, the trading system had a role to play in the global efforts to reduce existing risks, to prevent the creation of new risks and to build resilience.
972. Frances Lisson, Ambassador, Permanent Representative of Australia to the WTO outlined Australia's rationale to finance the research work. She stated that trade had an important role to play in countries' development, and that interruptions to trade resulting from natural disasters could be devastating. The Indo-Pacific region was one of the most disaster-prone globally, a reality which gave Australia a unique perspective on the importance of building resilience and strengthening national systems, including those systems that support and facilitate trade. She recognized that analysing and seeking to address the trade-related challenges that arose from natural disasters was important to many WTO Members.
973. Ambassador Lisson thanked the Secretariat for the comprehensive country reports. In Australia's view, the reports underlined that trade was a critical factor in disaster planning, response and recovery. In particular, there were important links between efforts to develop trade capacity and to build resilience to natural disasters. Strengthening a country's trade regime – for example through integrated policies, systems and regulations, as well as market liberalization – could help to minimize the economic impacts from disasters. The same was also true in reverse. Building resilience to natural disasters, through improved infrastructure, would help facilitate trade more generally.
974. She cited the report on Nepal and highlighted that the 2015 earthquakes exacerbated existing challenges with key infrastructure such as airports and roads. These constraints limited immediate growth prospects in the important sector of tourism – one of Nepal's main services exports which accounted for roughly 4% of GDP. Efforts to develop Nepal's tourism sector and related services were intertwined with efforts to build disaster-resilient infrastructure – the two went hand-in-hand.
975. The report on Dominica had highlighted a number of trade facilitation issues in the context of immediate responses to recent hurricanes. For example, surges in deliveries of relief goods had implications for container processing, the application of import tariffs and duties, and storage capacity. In the recovery phase, sanitary and phytosanitary (SPS) compliance capabilities resulting from crop damage had important implications for exports. And in terms of building disaster resilience, insurance coverage and weather forecasting services arose as opportunities to develop and expand domestic markets, including through trade.
976. Among the Pacific Islands, trade played a vital role and there had been significant growth in trade-to-GDP ratios – from 28% to 78% in Vanuatu over the period 2000-2016; and from 42% to 96% in Tonga over the same period. Clearly, the potential impacts on trade from natural disasters were significant, and recent cyclones were particularly damaging for agricultural exports.
977. At the same time, there are some encouraging signs, particularly in terms of the resilience of certain services sectors. In Tonga, for example, telecommunications and digital connectivity were not lost during, or in the aftermath of, Tropical Cyclone Gita. This enabled critical communications within the country and overseas, so giving confidence for investors to expand those sectors. Similarly, investment in disaster-resilient



- infrastructure in recent years meant that tourism continued after major events, ensuring important revenue sources continued.
978. In conclusion, Ambassador Lisson underlined that WTO research reports highlighted that there were both challenges and opportunities in these areas – and that efforts in one space, be it disaster resilience or trade capacity, were likely to have important benefits for the other.
979. Jaime Chissano, Minister Plenipotentiary, Permanent Representation of Mozambique to the WTO updated on the impact of Tropical Cyclones Idai and Kenneth on economic activities and trade and commended the role WTO undertook to link up natural disasters and trade. Tropical Cyclone Idai had had a heavy toll with over 600 lives lost. Cyclone Idai impacted some 1,5 million people, equivalent to 306,221 households. Some 715,378 hectares of crops had been lost to the Cyclone. Cyclone Idai had devastated the strategic social and economic infrastructure, i.e. the investments and progress made through years of investment in trade facilities had been drastically reversed. Farms, subsistence activities and livelihoods had been destroyed, threatening the food security of thousands, if not millions of households. One of the affected strategic infrastructures was the Beira Corridor, which consisted of a highway, railway and pipeline. The corridor serviced neighbouring countries of Malawi and Zimbabwe and, other countries further afield.
980. Mozambique had then witnessed a second extreme event: Tropical Cyclone Kenneth. Striking the northern part of the country, Cyclone Kenneth destroyed the entire district of Mocimboa da Praia and damaged districts in the Cabo Delgado province. In total, the cyclone has affected 213,462 people, corresponding to 45,833 households. Forty-three people had lost their lives and the cyclone had destroyed 31,431 hectares of crops. Cyclone Kenneth had also damaged the Pemba harbour.
981. The Government, with the support of international community, notably relevant UN humanitarian agencies, national and international NGOs, had assisted affected populations, through search and rescue operations, provision of food, medicines, and emergency shelter.
982. Mozambique's engagement with the United Nations Disaster Risk Reduction (DPR) framework had helped to mitigate human losses in both extreme events. Mozambique had already adopted legislation on DRR, including, but not limited to, the Law on Natural Disasters. Strategies at national, provincial and district levels, as per Sendai Framework, were also adopted and under implementation. Mozambique was determined to re-emerge and get back on its feet.
983. The Government had put in place a Post-Disaster Reconstruction Office with the mandate to survey and design a reconstruction plan, following an integrated approach. The Government had decided to exempt businesses in affected areas, of duties and other financial obligations, up to 31 December 2019, as to assist them to recover, rehabilitate and re-build, given the magnitude of destruction. The customs and tax exemptions were to benefit economic operators in the provinces and affected areas by an authorization for advanced release of imports of construction materials and food products.
984. In conclusion, Mr Chissano highlighted that the Post-Disaster Reconstruction Office was still assessing the damage caused by Cyclones Idai and Kenneth. The Government of Mozambique planned to present a full assessment during the Aid for Trade Global Review. The representative of Mozambique thanked the international community for their support.
985. In the question and answer session, the representative of Switzerland highlighted that Switzerland would host and co-chair the 6th session of the Global Platform for Disaster Risk Reduction 2019 which would focus on the topic of the "Resilience Dividend: Towards Sustainable and Inclusive Societies". This title reflected recognition that disaster risk reduction paid enormous dividends in creating resilient societies. Without disaster and climate risk management and risk-sensitive planning, development would not be sustainable and the goals of the 2030 Agenda and the Paris Agreement could not be achieved. Risk management was of vital importance to achieve these landmark agreements and thereby to achieve the goals that the international community had set for itself for 2030.
986. Investing in resilience came at a cost, but the benefits were far greater than the costs incurred. Current studies estimated that each dollar invested in risk prevention, avoided losses of at least US\$4 on average.³⁸⁴ Switzerland therefore strongly advocated for measures to prevent disasters. Hazards could no longer be tackled in isolation. Risk drivers – such as conflict, fragility, poverty and poor governance – exacerbated the destructive impact of disasters on the economy, societies and communities. Preparedness and prevention measures had to be undertaken jointly. This underscored the need to create and reinforce new partnerships to promote risk-informed investments. Decision makers at all levels had to go beyond the siloed engagement of stakeholders in charge of climate change, environment and disaster management. New and innovative partnerships were needed.

384 Mechler, R (2016). Reviewing estimates of the economic efficiency of disaster risk management: opportunities and limitations of using risk-based cost-benefit analysis. *Natural Hazards*, 81, 2121–2147



987. The Caribbean Community (CARICOM) Group stated that the topic of the Symposium was of great interest for CARICOM. In light of its exposure to the negative effects of climate change and predisposition to natural disasters, CARICOM proposed to use the Symposium as an opportunity to promote awareness among WTO Members of the adverse effects of natural disasters on trade.
988. Natural disasters had become more frequent and the impacts more severe in terms of loss of lives and damaged infrastructure. In the Caribbean, as Minister Felix had pointed out, the 2017 hurricane season had registered a record six consecutive hurricanes which had caused US\$229 billion in damage across the region.
989. The 2010 earthquake in Haiti was another example of how natural disasters could decimate economies. The destruction to the economies in CARICOM provided a clear illustration of the substantial threat and impact of natural disasters on trade for the global community. Hurricane Maria in September 2017 had caused destruction estimated at over 200% of GDP in Dominica.
990. The Caribbean region was particularly vulnerable to natural disasters and comprehensive solutions were needed to address the harmful effects on trade. It was essential for CARICOM to be afforded a special treatment beyond what was now offered by existing WTO rules. It was evident that small, vulnerable economies needed flexibilities appropriate to their vulnerabilities. In an effort to help affected Members to build and revive growth and development, CARICOM called on WTO Members to establish a mechanism that could be activated subsequent to catastrophes of natural disasters and provide the necessary policy space to achieve recovery in the shortest possible time. The Caribbean countries were among the most vulnerable nations in terms of natural disasters. CARICOM supported the crafting of rules that promoted the building of economic and trade resilience.
991. CARICOM recalled the proposal that was put forward by Antigua, Barbuda, Dominica, Grenada, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines during MC11 in Buenos Aires. CARICOM believed that WTO rules and disciplines must not stand in the way of reconstruction. The full flexibility of the multilateral trading system should be deployed so that reconstruction measures taken by affected Members would be deemed compatible with the WTO Agreements.
992. Michael Roberts, Head, Aid-for-Trade Unit, WTO Development Division, presented an overview of the findings of the country research papers that focused on six disaster affected states (Dominica, Fiji, Nepal, Saint Lucia, Tonga and Vanuatu). His presentation focused on: (i) hazards and macroeconomic effects; (ii) trade and disaster response; (iii) trade and disaster recovery; and (iv) trade and disaster resilience.
993. Hydro-meteorological risks such as tropical cyclones, hurricanes, flash flooding and landslides were the most common types of disaster. Geophysical events, such as the earthquake that struck Nepal in 2015, were also a threat. Geophysical events could also provoke secondary hazards, such as tsunamis in coastal states. While these were not necessarily new risks, climate change threatened to make hydro-meteorological risks more frequent and intense.
994. Mr Roberts quoted International Monetary Fund research that in any given year, it was likely that the five islands surveyed would be either hit by, or recovering from, a major natural disaster, most commonly hydro-meteorological in origin (storms, hurricanes, cyclones, flooding, etc). He used the analogy of entering a bad luck lottery. In any one year, policymakers did not know if they would get hit by a disaster, how hard that event would strike, or whether or not there was the possibility of multiple disasters. He cited the examples of Dominica and Mozambique. Damage caused by Tropical Storm Erika in late August 2015 was estimated at 90% of Dominica's GDP. Just over two years later, Hurricane Maria had hit the Caribbean island adding damage estimated at 226% of GDP. In 2019, Mozambique suffered two storm hits in the same season when Tropical Cyclones Idai and Kenneth made landfall. Furthermore, there was not just one risk that had to be contained. For example, Nepal had to contend with seasonal rains, flooding, and seismic hazards.
995. Economic and trade policymaking was complex when faced with the volatility induced by external shocks and the risk of natural disasters. To illustrate the point, Mr Roberts referred to Dominica's public debt trajectory over the period 2001 to 2017. The Government together with IMF, taken actions to bring the public debt down in the period 2001-2007. After 2009, public debt had grown as the Government contended with the effects of the global financial crisis. Measures to curtail public spending had again brought public debt under control. In the wake of Tropical Storm Erika in 2015, public debt had started to grow again due to reconstruction activities. In 2017, Dominica had had to struggle with the task of cleaning up after Hurricane Maria which had caused damage estimated at over 220% of GDP. He quoted the conclusion of the IMF that that natural disasters create a significant risk to debt sustainability in Dominica.
996. Several trade issues were identified that could arise during the response to natural disasters. Some trade issues were caused by delays in triggering emergency legislation. In an emergency situation,



Session 3: Presentation of country research results

992. Michael Roberts, Head, Aid-for-Trade Unit, WTO Development Division, presented an overview of the findings of the country research papers that focused on six disaster affected states (Dominica,

goods needed to come in quickly and customs needed enabling legislation to be in place so as to apply waivers from customs duties for imports of certain goods (e.g. humanitarian relief). Without the necessary legislation in place, customs and other border agencies could not allow imports into the country duty-free or apply simplified customs procedures. He quoted the example of Tonga which had triggered emergency legislation in advance of the arrival of Tropical Cyclone Gita which had significantly facilitated the relief efforts. This contrasted strongly with examples cited elsewhere in the research where delays of six weeks or more in clearing containers through customs has been experienced.

997. Uncertainties to whether or not an organization or consignment should be exempted from customs duties or taxes was another cause of delays in the disaster response period. These issues were compounded by the actions of some relief actors who sought to work outside of official channels – a tendency that could create difficulties for government control. Other specific issues also arose, such as import licences for specific goods. The storage and disposal of unsolicited bilateral donations (expired medicines, second hand clothes etc) were also cited as concerns. Implementation of the Trade Facilitation Agreement would help address some of the trade frictions that arise, both commercial consignments and also relief goods.
998. Trade issues also arose in disaster recovery. Vanuatu's export performance for merchandise goods was given as an example. The trade gap between imports and exports had grown significantly since 2010. Cyclone Pam in 2015 had further accentuated this trend as further increased. Vanuatu's merchandise exports had remained static over the period, while imports had shown tremendous growth. Other specific issues included: pressure on manufacturing and the fishery sector, the need to import environmental services, customs clearance issues and tariff issues related to equipment parts, access to finance, SPS issues and other non-tariff concerns.
999. Trade policy could also play a role in promoting disaster resilience. In Nepal for example, the provision of reconstruction subsidies in the wake of the 2015 earthquake was made conditional on the use of building techniques which were adapted to seismic risk. There was an international trade dimension since 80% of building materials in Nepal were imported. High tariff rates on building materials could act as a disincentive and push the construction sector to use lower grade materials. Trade issues relating to operation of agricultural markets, food aid, control of SPS/TBT issues, also arose in the context of measures to promote resilience.
1000. In conclusion, he highlighted that the Sendai Framework for Disaster Risk Reduction 2015-2030 put emphasis on *ex-ante* action and "building back

better". There was a considerable role for trade and trade policy to play in limiting the economic impact of disasters in such areas as standards, promoting trade connectivity, government procurement and through tariff policy.

1001. Madhu Kumar Marasini, Joint Secretary, Head of Multilateral Trade and Trade Cooperation, Ministry of Industry, Commerce and Supplies, Nepal began his statement by highlighting that the Symposium was an opportune event to exchange country experiences, learn from each other, transmit good practice, and invite international attention and support for disaster mitigation, resilience, and recovery. In his view, trade had an important role to maintain the robustness of the economy in the face of disaster risks. He likened trade to the circulation of blood in the economy, connecting producers to end users and establishing backward and forward linkages. Trade kept markets and societies creative, competitive, and dynamic. The global community had a responsibility to ensure that no disaster became a stumbling block to trade. Following the spirit of the 2030 Sustainable Development Agenda and the Sendai Framework for Disaster Risk Reduction, it was imperative that no one should be left out.
1002. Against this background, Mr Marasini thanked the WTO for the Nepal case study and the Government of Australia for providing funding. The Nepal study report drafted by the WTO was inclusive and comprehensive, both in terms of context and coverage. Nepal's geography made it vulnerable to natural disaster (it was the 4th most vulnerable country to climate change-induced hazards, and 11th in relation to earthquakes). The study discussed the devastating earthquake of 2015 and its effects on the Nepali economy and society and put them to use to understand the ramifications of such an event on a landlocked, least developed country. The study rightly elaborated the consequences of this natural disaster, not only on trade, but also on the wider impact on the economy and society. These impacts were so pervasive that Nepal had had to defer its ambitious target of graduation from LDCs status. As such, the WTO study would be a good reference for all scholars and practitioners of natural disaster and development.
1003. Mr Marasini noted his appreciation of the report's acknowledgement of the Government of Nepal's prompt action in response to the 2015 earthquake and related investment in preparedness. The study had also fairly pointed out the limitations and difficulties encountered in the course of rescue and rehabilitation phases. Despite the constraints of being landlocked and being a least developed economy, the response to the 2015 earthquake had been commended by international partners. Noteworthy was the resilience of Nepali people, built on traditional community principles.
1004. Natural disasters were not only the results of Nepal's exposure to geophysical and



meteorological hazards, but were equally the result of global warming and manifested themselves in many forms: such as landslides, floods, inundation, draughts, avalanches, bursting of glacier lakes, etc. He suggested that the correlation between climate change and growing frequency of natural disasters should also be included in this study.

1005. The **Post Disaster Needs Assessment** estimated the impact of the disaster on Nepal at 33% of GDP. Growth declined sharply from 4.6% in 2014 to 0.4% in 2015. The manufacturing, trade and tourism sectors met with huge losses. Due to the scale of the challenge posed by the 2015 earthquake, Nepal's graduation from the United Nation's least developed country category had had to be deferred to allow further time for recovery. He suggested that losses in the education and UNESCO heritage sectors could also be included in the study as they would have a long-term bearing on Nepali society and economy.
1006. The Nepali economy was highly trade-oriented and dependent on remittances (around 26% of GDP). The export-import ratio had reached to 1:15.5 in 2017/18. The surge in imports had continued in the aftermath of the disaster and the trade deficit continued to widen. Remittances had been a social safety net instrument. But for the sustainability of the Nepali economy, support had to be mobilized on economic transformation, productivity enhancement, and creating domestic employment at a larger scale. Systemic shortcomings had to be addressed and the necessary instruments of support be mobilized from development partners through the Aid-for-Trade Initiative.
1007. Policy and institutional reforms had been enacted during reconstruction. The National Reconstruction Authority had been created, which was also supported by necessary laws and policies. The import of reconstruction materials had contributed to a widening of the trade deficit. Ironically, there was a shortage of labour in the construction and agriculture sector. Yet, the flow of outbound labour continued. Without a revival in the manufacturing sector it would be challenging to retain workers.
1008. The International Conference on Nepal's Reconstruction had collected commitments totalling US\$4.1 billion for post-earthquake reconstruction. The aid money, together with matching funds from the Government, was being utilized primarily for the reconstruction of housing, schools and heritage sites. There were shortfalls in financing trade-related infrastructures such as the roads to connect to border points. Customs buildings and dry ports on borders were not yet in full operation. The transit difficulties repeatedly encountered by Nepal as a landlocked country also had to be acknowledged. Therefore, it was critically important to mobilize Aid for Trade as well as trade facilitation assistance in addition to the humanitarian support. The disaster-damaged economy required large scale investment, which could not be funded by domestic revenue alone.
1009. The nexus between trade and natural disasters was complex and challenging. The situation called for a cooperative and collaborative approach. Trade measures impacted the whole cycle of disaster management from preparedness, rescue, recovery to reconstruction. Rescue and relief activities, basically the supply of shelter-related materials and food items, had been the most impacted by trade measures such as customs duties, documentary requirements, test procedures, etc. Thus, implementation of the WTO Trade Facilitation Agreement was imperative.
1010. Mr Marasini concurred with the trade and resilience issues identified in the study that Nepal needed to restructure its public investment programme, intensify competition in sectors such as transport and logistics, to reduce the cost of doing business, and to integrate Nepal into the global economy. This would only be possible with the support by institutions such as the WTO. He also acknowledged the proposal submitted by the Caribbean and Small and Vulnerable Economies for flexibilities in the WTO obligations required for recovering from natural disasters submitted during MC11 in December 2017 (WT/MIN(17)/37). It was also relevant for Nepal.
1011. The representative of Dominica, Matthan Walter, Director of Trade, Ministry of Trade, Energy and Employment, expressed his gratitude and appreciation to the Members and the WTO Secretariat for acting on the MC11 call to look at the natural disasters and thanked the Mission of Australia for providing the funding for the study on natural disasters and impact on trade. Without these funds, the correlation and link established between the impact on natural disasters on trade, would not become a reality. He also thanked the Development Division for its comprehensive study.
1012. Mr Walter recalled than two years ago, about 226% of Dominica's GDP had been washed away in a few hours. The focus after the hurricane had been on recovery, rebuilding, saving lives and providing food and accommodation for the displaced people. True flexibility during that period at the regional and multilateral level was a consideration which required contemplation, accompanied by the evidence required to establish a link between natural disasters and a country's ability to trade. The Symposium established this link in Mr Walter's opinion.
1013. Dominica, after Hurricane Maria, had begun to build its resilience, and planned to become the first climate resilience nation in the world. The idea was to ensure resilience and speedy recovery. A number of initiatives had been implemented. The Office of Disaster Management had ensured that houses and specially constructed emergency centres in key locations were resilient, improved



communications had been established, together with an island-wide network of radios and training individuals in the communities of the use of equipment.

1014. Dominica's Sea and Port Authority had established an automated container tracking system through the adoption of ICT technology. Some 30,000 square meters of land had been converted and rehabilitated in an effort to separate household goods from business cargo, together with fast lanes where high volume business could be pre-cleared. In addition, open-air space had been allocated for the placement of empty containers and vehicles. Container fees had been raised to dissuade shippers from using the port as a storage area so as to reduce congestion at the port. A contact database had also been set up in case of emergency, so the port could contact clients to inform them about cargo arrivals and to avoid cargo congestion. Through these actions, Dominica wanted to ensure, that issues indicated in the study would be mitigated.
1015. The Customs Directorate of Dominica had developed an *ex-ante* preparedness plan together with the port authorities. The plan identified key personnel from both agencies to work on the recovery efforts, identification of services locations to stock cargo outside of the place of the operations. Proactive plans were developed for the processing of vehicles and aircraft passengers in coordination with other relevant governmental agencies. Distribution points in case of natural disasters had also been identified so as to ensure adequate supplies such as food, water, medicines sufficient to withstand weather stress. The Ministry of Agriculture had also developed the implementation of building codes for farm and animal houses, identified climate resilient crops, provided support for the irrigation system to allow for quick re-establishment of farms and maintenance of food security, etc. These were a few of the initiatives taken to build resilience,
1016. The impact of natural disasters could be significant and even move a country from developing status to that of an LDC. Dominica requested the WTO Membership to acknowledge that the reconstruction, recovery and development of post-disaster would take many years and therefore during this time, WTO rules and disciplines should not stand in the way of reconstruction.
1017. Dominica sought the full flexibility of the multilateral trading system to be deployed, so that reconstruction measures taken by the affected Members would be considered compatible with WTO Agreements. More specifically, Dominica requested amendment of GATT Article XX to reflect a derogation from WTO rules, contingent on the passage of a natural disaster, during the recovery period. Dominica also sought consideration of the Agreement on Subsidies and Countervailing Measures to allow specific and prohibited subsidies to be provided to affected industries in an effort to stimulate quick recovery, while not being subject during this period to countervailing measures by other WTO Members. Dominica also requested consideration in the area of market access and the application of tariffs above bound rates to encourage farmers for example, to invest in agriculture in an effort to avert food security concerns.
1018. Consideration was also requested for a waiver or deferral of contributions to the WTO for a prescribed period. Dominica believed that if affirmative consideration was given to these recommendations, disaster-prone countries could recover faster and would more easily reintegrate into the global trading system.
1019. The representative of Vanuatu, Roy Mickey Joy, Ambassador, Director General, Ministry of Tourism, Trade, Industry, Commerce, presented the challenges that Vanuatu was facing and underlined the economic impacts of the natural disasters. Such events negatively affected the country's competitiveness in international trade arena. In recent years, natural disasters had increased in frequency and intensity. He underlined the need for coordination between WTO and other agencies to avoid duplication and ensure a holistic approach in dealing with natural disasters.
1020. Vanuatu was extremely vulnerable to natural disasters and was considered as the country most at risk on natural disasters by the United Nations. Between 1950 and 2011, natural disasters were responsible for a loss of 6.6% of annual GDP according to the World Bank report of 2017. Cyclone Pam which was one of the major natural disasters, caused damage equal to 64% of GDP. It affected the country's economy, including one of the key sectors, tourism. Expenditure for reconstructions increased, leading to an increase in public debt to GDP ratio by 20 percentage points. Merchandise exports declined by 37%, while the imports had increased by 21.4%, so worsening the trade deficit.
1021. Vanuatu was a rural nation, with 80% of the country still engaged in agriculture. One of the few merchandise goods in which Vanuatu had a comparative advantage was kava. Kava accounted for 50% of the merchandise exports in 2018 and there is also a driving domestic market. Kava took between three to seven years, with a minimum of three years for the domestic market and up to four or five years for export markets. Natural disasters such as cyclone Pam, had a negative impact on the kava industry and a negative impact on Vanuatu's trade, both domestically and internationally. Kava was very important culturally, economically and also politically for Vanuatu. Major political considerations were made over kava. The level of consumption locally was very high and in the case of a kava shortage, most people would not be able to pay higher prices. The demand for kava was also increasing internationally.



1022. Tourism was the most important sector for Vanuatu in terms of GDP contribution. Vulnerability to natural disasters provided a strong disincentive to invest in the tourism sector. As well as tropical cyclones, Vanuatu was vulnerable to other natural disasters such as earthquakes, tsunamis and volcano eruptions. In 2017, up to 11,000 people had to be evacuated due to volcanic eruptions.
1023. The future of climate change and the impact of natural disasters was still very uncertain. There was a possibility that the frequency and the severity of natural disasters would increase. In the long run, climate change could have a devastating impact on Vanuatu. Some islands could become unpopulated, with key tourist destinations under threat.
1024. On adaptation and climate change, the World Bank estimated that by 2040, 22% of GDP would need to be spent on adaptation costs every year. This represented a huge cost for a poor country like Vanuatu. This money could be better spent on investments or simply on consumption.
1025. On mitigation, Vanuatu was committed to 100% renewable energy, with an interim target of 65% by 2020. However, this could prove difficult to achieve. Vanuatu currently produced 80% of its grid electricity from diesel. Support from donors was required to achieve renewable energy targets.
1026. Ambassador Joy then made proposals for consideration. Global rules could contribute to building resilience to natural disasters by addressing the needs and identifying measures for countries that were graduating from the LDC status. Stronger coordination between WTO and other UN Agencies such as UNCTAD was needed so as to enhance coordination and avoid duplication. Regional and global integration need to be encouraged at the WTO in supporting of building resilience to external shocks. He called on WTO Members to support the needs of small Members like Vanuatu that depended on the multilateral trading system. Work was needed to build resilience into the WTO, but also to make sure that bigger countries did not compromise the rules of the system.
1027. Esterlina Kautoke Alipate, Senior Trade Officer, Trade Division, Ministry of Trade and Economic Development, Tonga thanked WTO for its work which was of utmost importance for her country. She highlighted that the connection between natural disasters and trade was vital for a small island developing country like Tonga. The onset of climate change, and the unpredictability and frequency of natural hazards and natural disasters, not only affected and devastated the natural environment, but it could also set back development efforts in one single day. This connection was crucial in better recognizing the unique vulnerabilities that Small Island Developing States encountered. It helped to put the spotlight on the trade and natural disaster nexus which would enable us to devise better and effective policy responses, especially with respect to the important role trade is expected to play in the achievement of the SDGs.
1028. Tonga's geographical, geological and socio-economic profile made it highly susceptible to events such as tropical cyclones, tsunamis, sea-level rise, earthquakes, droughts, with consequences that were often unpredictable. Tonga's economy was highly dependent on remittance flows, donor grants, agriculture, tourism and fisheries exports which posed sustainability challenges when natural disasters were encountered. Geographical remoteness, high transportation costs, low diversification, narrow production base, and limited economies of scale placed Tonga at a competitive disadvantage.
1029. Tropical Cyclone Gita, a category 4 tropical cyclone, had impacted 80,000 people in Tonga (two-thirds of Tonga's population) and caused economic losses of approximately US\$164.1 million or 30% of GDP. The cyclone had caused three times more damage (as measured as a percentage of GDP) than Tropical Cyclone Ian in 2014. The economic growth rate fell to 1.1% in 2017/18 well below the 3.0% earlier estimated, and far below the average of 3.4% of the previous three years. The agricultural, housing, tourism and fisheries sectors were greatly affected. The agriculture sector was the hardest hit with 90% of fruit trees and 40% of root crops destroyed, while the fishing sector for 2017/18 saw negative growth of 0.1% associated with Tropical Cyclone Gita damage to the fisheries sector.
1030. Tonga was working to develop a coordinated, and whole of government approach to its resilience efforts to climate change. As a country ranked second at risk to natural hazards according to the World Vulnerability Index, building greater resilience, at all levels and in all sectors of government, was a priority for Tonga. To fully mainstream the goal of a resilient Tonga into government legislation, policies and planning at all levels, government, with the assistance of development and donor partners, had taken steps to focus on disaster risk management and climate resilience by integrating it into the Tonga Strategic Development Framework 2015-2025. One of its seven goals was to commit Tonga to becoming more resilient to climate and risk. A Tonga Climate Change Policy and a revised version of the Joint Action Plan for Disaster Risk Reduction and Climate Change adaptation had been adopted that set out six policy objectives and targets to achieve its vision of a Resilient Tonga by 2035.
1031. Taking a 'whole of Tonga' approach, remained consistent with the Framework for Resilient Development in the Pacific and international agreements including the Sendai Framework, the Paris Agreement, and the 2030 Agenda for



- Sustainable Development. In the wake of Cyclone Gita, donor partners and Tongan diaspora all over the world had helped by providing support for the recovery effort. The work undertaken by the Government included grants provided to farmers, fishermen and some business people (tourism related) to alleviate debts on recovery efforts, fixing of infrastructure. Tax exemptions for building materials imported from overseas for recovery efforts was another policy instrument. The Global Facility for Disaster Reduction and Recovery had supported the Government of Tonga to conduct a rapid disaster assessment that helped identify damage, loss, and recovery needs following Tropical Cyclone Gita. It had resulted in a US\$20 million request from the World Bank International Development Assistance Crisis Response Window to finance immediate climate resilient school repair and reconstruction and budget support.
1032. Tonga was investing close to US\$40 million in building resilience through the improvement of multi-hazard early warning systems including: 1) Asian Development Bank Climate Resilience sector project for the upgrade of weather and coastal ocean monitoring equipment; 2) Pacific Resilience Project for the upgrade of multi-hazard early warning systems; and 3) Japan Grant Aid US\$25.5 million for Nation Wide Early Warning System. Additionally, the Government of Tonga had made strides in strengthening its financial resilience to natural hazard shocks
1033. Challenges remaining included better incorporating the economic impact of natural disasters in the medium and long-term economic planning to improve fiscal policy decisions. Ms Alipate asked how Tonga could effectively integrate natural disaster planning into existing policies in accordance with the WTO rules, but also tailored to its own specific needs? Whilst many discussions were taking place in the international fora on developing resilience to climate change, such as the development of environmentally sound technologies, resilient infrastructure, it was vital to recognize the trade implications and the interlinkages on the issue of resilience. In doing so, it would allow for the avoidance of duplication and facilitate a coordinated approach towards resilience.
1034. While humanitarian action to mitigate the impact of disasters would always be vitally important, the global community was facing a critical challenge: How to better anticipate – and then reduce – disaster risk by integrating the potential threat into planning and policies. For countries such as Tonga, it was crucial to recognize that efforts to promote resilience were not a unilateral effort but needed to be supported by donor partners. Learning from the experience with integrating health objectives into tariff policy, a similar approach could be piloted for disaster resilience.
1035. The representative of Fiji, Vueti May, thanked WTO for the excellent work and the Australian Mission for the support provided. As a small and vulnerable economy, Fiji was exposed to the risk of natural disasters which caused huge economic losses and hindered Fiji's ability to compete on global markets. Natural disasters had transformed Fiji's natural world; extreme weather catastrophes and their frequencies was the proof that the world had changed.
1036. Fiji was located in the tropical cyclone zone. Statistics clearly articulated the economic losses that Fiji had incurred. Without these losses, additional investment could have been made in other income-generating areas rather than rehabilitation. Fiji needed to build more resilience in the face of these global phenomena. A single extreme weather event, such as Tropical Cyclone Winston which had hit Fiji in 2016 and from which the country was still recovering, had wiped out one third of GDP.
1037. He drew attention to unpredictable nature of tropical cyclones and the complications this had for planning and response. The intensity of tropical cyclones had upended Fiji's previous risk analysis. Tropical Cyclone Winston was the first time that a category five tropical cyclone had landed on Fiji. The intensity of the storm had not been predicted and the damage caused had surpassed past estimates. Tropical Cyclone Winston did not follow a traditional pathway from the North to West, thus making the scope and the scale of damage prediction challenging. Parts of Fiji that had traditionally been the least affected by cyclones were now among the worst hit.
1038. Agriculture was the mainstay of Fiji's economy and contributing 28% to total employment and 9% to GDP. The sector took a lot of time to recover from natural disasters, with a huge effect on Fiji's exports. As a regional hub for the Pacific, natural disasters also impacted the regional economy through for example airline connectivity. When these events occurred, it created a lot of trade diversion and destruction, with implications for global value chains.
1039. Fiji was building and remained committed to achieving the 2030 Sustainable Development Agenda. Fiji embedded commitments in its National Development Plan to ensure that it would sustainably develop, strive to reduce poverty and prioritize social and economic progress, so to ensure that no one was left behind. One of the key accomplishments was the launch of Fiji's vulnerability assessment report. The assessment was conducted by the World Bank and it reconfirmed Fiji's exposure to climate change. Annualized annual losses due to extreme weather events would amount to 6.5% of the GDP by 2050 according to World Bank predictions. Some US\$9.3 billion would be needed in the next ten years to finance adaptation work across Fiji.



1040. In 2014, the Government of Fiji moved its first coastal community to safer ground. Two other communities had subsequently been moved. Tragically, Fiji was only at the start of these relocations. Another 43 coastal communities would follow. One point that Fiji stressed though was the need for these relocations to occur across borders as well as internally.
1041. Extreme weather patterns made Fiji's economy and society more fragile. When economic and social fragility increased, institutions suffered. They became more open to manipulation by extremists, corruption, international criminals and geo-political opportunists. Fiji called for global efforts to assist vulnerable, small island economies to strengthen their resilience. Mr May urged the Symposium participants to use the disaster research to improve cooperation and ensure that small economies were on an equal footing in the global economy.
1042. Fiji joined others in requesting flexibility in WTO rules when a state was in a recovery phase. Fiji looked forward to continuing to engage with the WTO and tackling the growing international trade consequences of natural disasters and climate change.
1043. The representative of the Pacific Island Forum Secretariat highlighted that *ex-ante* planning was of paramount importance to withstand the impact of natural disasters. The Pacific was providing a regional response to this call at both policy and project level. At a policy level, the Pacific Island Forum Leaders in 2016 had adopted the Framework for Resilient Development in the Pacific (FRDP) 2017-2030, and the Pacific Resilience Partnership (PRP). The FRDP was an integrated approach to address climate change and disaster risk management considerations for resilient development. This framework brought together climate change, disaster risk management, low carbon development and their respective finance responses into one consolidated approach. It proposed collective action and regional approaches that provided opportunities for economies of scale, shared capacity, information and experiences, and leveraging resources as a group.
1044. The Forum Secretariat and its regional partners were working on governance arrangements to implement the framework, which were known as the Pacific Resilience Partnership. The inaugural Pacific Resilience Meeting had been convened in the first week of May 2019 in Suva, Fiji and had attracted more than 300 participants. Work was now in progress to establish technical working groups to support the implementation of the FRDP.
1045. At project level, the Pacific response focused on the Pacific Resilience Facility (PRF). Although a suite of risk-financing products was available to cope with the aftermath of disasters from extreme hazard risk events, there was very limited support for countries to invest in ensuring resilient infrastructure development to reduce the economic costs and losses from disasters. Risk-proofing investments upfront could yield substantial benefits. For example, global research showed that for every US\$1 spent on building resilience to catastrophic events saved up to US\$7 in disaster response and recovery. This insight had prompted the Forum Economic Ministers Meeting in 2017 to task the Secretariat to consult and design with Members a concept for a regional fund/facility. With support from Australia, international consultants were engaged to consult and design the governance and legal aspects of the facility. The paper would be considered at a special meeting in July 2019.
1046. The PRF proposed a regional fund/facility to assist governments, private sector and communities to co-finance and leverage additional funding for both new infrastructure projects and/or retrofitting existing infrastructure – to prevent and/or reduce risk, and in doing so build resilience. The PRF also provides all Pacific Island Forum countries with the opportunity to develop and refine national policies and planning processes through targeted capacity building, particularly in the management of growing risks and externalities associated with climate change. The work on the PRF represented an investment in a regionally developed and innovative financial arrangement, for managing current and future climate change risks.

Session 4: Next steps

1047. Michael Roberts, Head, Aid-for-Trade Unit, WTO Development Division, updated on the next steps planned for the Natural Disasters and Trade research at WTO which were to: (i) finalize the various country studies that have been published in draft form. A deadline for submission of comments was set as 17 May 2019; (ii) draft a paper on how the issue of disaster response, recovery and resilience and trade; and (iii) finalize the legal mapping which looked at how the issues discussed could be addressed under the existing WTO Agreement. Once these documents were ready, a further Symposium would be organized in the fall.

Disclaimer: This is an informal report of the Symposium prepared by the WTO Secretariat. The opinions expressed are not intended to represent the positions or opinions of the WTO or its members and are without prejudice to members' rights and obligations under the WTO.



SYMPOSIUM 4

A fourth Symposium was held on 29 November 2019.

Session 1: Taking resilience forward - engaging the trade community in disaster risk reduction

Welcome remarks: Shishir Priyadarshi, Director, Development Division, WTO

Presentation of research:

- Michael Roberts, Head, Aid for Trade Unit, Development Division, WTO
- Ankai Xu, Research Economist, Economic Research and Statistics Division, WTO
- Giovanna Adinolfi, Professor of International Law, University of Milan

Session 2: Comment from discussants

Moderator: Michael Roberts, Head, Aid for Trade Unit, Development Division, WTO

Comments and reactions:

- Vyara Filipova, Technical Attaché, Compliance and Facilitation Directorate, World Customs Organization
- Pierre Sauvé, Senior Trade Specialist, Macroeconomics, Trade and Investment Global Practice, World Bank Group
- Irina Zodrow, Head, Partnerships Unit, UN Office for Disaster Risk Reduction

Session 3: Comments from Members

Moderator: Shishir Priyadarshi, Director, Development Division, WTO



Session 1: Taking resilience forward - engaging the trade community in disaster risk reduction

1048. **Shishir Priyadarshi, Director, Development Division**, welcomed participants. The aim of the fourth Symposium was to communicate a substantive piece of research on natural disasters and trade. Two reports had been drafted and were being published as drafts with a deadline of 31 December 2019 for comments. Executive summaries of the two reports were available on the [WTO website](#), alongside the full versions of both studies.

1049. Mr Priyadarshi expressed his thanks to the Mission of Australia for its financial support for the project. He acknowledged the support received from Members, in particular the six disaster-affected Members surveyed, and also thanked the World Customs Organization (WCO), World Bank (WBG) and UN Office for Disaster Risk Reduction (UNDRR) for agreeing to act as discussants.

1050. Setting the stage for the discussion, he began his remarks by asking two questions: "Why discuss natural disasters in a trade context?", and "How can trade measures interact with natural disasters?". Natural disasters impacted the exports and imports of disaster-affected Members and these effects in turn, spread through value chains. While large scale natural disasters received news coverage, many smaller, more frequent events went unreported. Natural disasters affected both trade in goods and services. Negative impacts occurred both as direct impacts, e.g. machinery damaged due to flooding, or as indirect effects, e.g. tourists opting for a different holiday destination.

1051. He also highlighted how trade measures can interact with natural disasters. He recalled a point made at the first Symposium on natural disasters and trade in April 2018, that while hazards were natural, disasters were man-made. There was a range of actions that could, either unintentionally or deliberately, make it harder to respond to a disaster. Restrictions could hinder the ability of the trade system to balance out disaster events, and so magnify their impact. He underscored the importance of ensuring trade measures did not inhibit the inflow and outflow of goods and services in the event of a natural disaster.

Presentation of the reports

1052. The **first report** was presented by **Michael Roberts, Head, Aid-for-Trade Unit, WTO** and **Ankai Xu, Research Economist, Economic Research and Statistics Division, WTO**.

1053. **Michael Roberts** started his presentation by evoking a quote from Elhadj As Sy, International Federation of Red Cross and Red Crescent Societies (IFRC) Secretary General, "shocks and

hazards may be natural but disasters depend on us". The presence of a natural hazard did not automatically equate with a natural disaster. Other factors, namely exposure and vulnerability, came into play.

1054. He illustrated how comparable hazards could produce different impacts by discussing three earthquakes (i.e. those in Chile, New Zealand, Haiti between 2010-2011) which had all been at the extreme end of the Richter scale. The damage and loss of life incurred had varied significantly across the three countries. While the reported damage in monetary terms was highest in New Zealand and Chile, Haiti reported the highest number of deaths and damage when measured in relation to GDP. The location of the earthquake close to the major city in Haiti meant that many more people were exposed to the hazard. This exposure combined with vulnerability, due to unplanned urbanization, low income and poor building standards, had resulted in a high number of casualties.

1055. Discussing the frequency of disasters, he noted that geophysical events (e.g. earthquakes) tended to occur more or less consistently – although the location and magnitude of events could not be predicted with accuracy. The frequency of hydro-meteorological events had been following an upward trend, resulting from natural and man-made climate change increasing both the frequency and intensity of disasters. Exposure to disasters was dynamic, not static. The same was also true of vulnerability to disaster risk that influenced decisions on where to locate assets, how they were built and the type of economic activities undertaken. Through technology (e.g. warning systems) and better preparedness, the number of deaths recorded had been steadily falling year-on-year. Building techniques and international standards could also help reduce vulnerability further.

1056. Looking across different regions, the highest number of natural disasters was reported in Asia. However, in terms of the value of the damages incurred, America and Asia were almost comparable. This value of damage recorded in both Oceania and in Africa was significantly lower, due both to lower asset values, under-reporting or lack of capacity to capture economic impacts.

1057. The indicators used to capture economic losses from natural disaster produced quite different perspectives. Larger and more diversified economies (i.e. U.S, China, India, Japan) incurred the highest loss in absolute terms, but lower values when measured as a percentage of GDP. Smaller economies (i.e. Dominica, Vanuatu) tended to face higher economic losses as a percentage to GDP. The amount of time between disasters had also been taken into account in considering the damage, as frequently occurring events acted as a brake on development. He noted that among those countries in the United Nations category of Small



- Island Developing States, International Monetary Fund (IMF) research had identified the Caribbean as being particularly severely affected by natural disasters. Past trends also highlighted that disasters tended not to happen in isolation, but rather interacted with broader economic trends. For example, following the global downturn in the 2008-9 financial crisis, Paraguay's economy had further suffered a major drought in 2011. The drought caused a contraction in economic activity and output comparable in size to that of the financial crisis.
1058. Ankai Xu began her presentation by discussing how trade was affected by natural disasters. Natural disasters and trade interacted in complex, and often unexpected ways. From the macroeconomic perspective, a natural disaster generated economic destruction and delivered a shock to the aggregate supply curve, resulting in a decline in real output and employment. One important function that trade performed was that of a "shock-absorber" for natural disasters. Imports provided a vital channel for making goods and services available that would otherwise be in short supply in a disaster-struck country. Such goods and services included food, medical supplies, emergency equipment and expertise to aid relief and recovery efforts. Insurance and international reinsurance, for example, could help absorb the losses from natural disasters and sometimes shift the burden of disaster response and recovery from the government to the private sector.
1059. She discussed the "vicious cycle" of natural disasters. Natural disasters caused output and export to decline because of the damage to export-oriented companies and trade-related infrastructure (i.e. ports, airports, roads, customs offices, telecommunications). Countries could then experience a sharp deterioration in their trade balance, which resulted in rising public debt. Sluggish export recovery could constrain a country's ability to recover from a natural disaster, adding further financial pressure. Vulnerable small developing economies tended to get caught in this "vicious cycle" especially when natural disasters happened so frequently that they are unable to recover from one before the next one hit them.
1060. From a sectoral point of view, she noted the negative impact that floods and droughts exerted on countries highly concentrated on agricultural exports. The 2010 flood in Pakistan and 2008-2011 drought in Kenya had both caused large losses in crops and livestock. Natural disasters could also lead to a decline in services exports by an average of two to three per cent. This figure was likely to be an underestimate because many developing countries did not report services trade data. Capital intensive services sectors such as transportation and communication were the most affected by natural disasters. Tourism, an important sector for small economies, tended to shrink after a natural disaster due to infrastructure damage and perceived risk.
1061. She pointed to the case of Japan's earthquake to illustrate the impact natural disasters could have on private consumption, supply chains, the economy of disaster-affected countries, and the trade performance of partner countries. She highlighted the importance of international efforts to tackle or minimize the impacts of natural disasters. To strengthen the resilience of supply chains, she recommended enhanced multi-sectoral cooperation, better information sharing among countries, developing and adopting international standards, and the use of risk assessment tools.
1062. Michael Roberts further elaborated on insights from an analysis of trade policy reviews (TPRs) undertaken in the period from January 2010 to September 2019. Of the 172 TPRs conducted in this period, 31% referred to a natural disaster. A number of references were to the trade effects of a natural disaster taking place in another WTO Member (e.g. the impact of the Thai floods on Japanese companies), and underscored how impacts propagated through global value chains. The type of disaster most commonly referred to in TPRs over this period was drought. References to floods, storms, earthquakes and volcanoes also appeared.
1063. Various policy measures taken by Members for disaster response, recovery, and resilience also appeared in the TPRs. Response actions included trade measures on customs, VAT exemptions, temporary tariff reductions, and export restrictions. For instance, in the aftermath of the 2008 earthquake in Sichuan, the Chinese Government had temporarily reduced import tariffs for a number of food products. Another example was a Central American Member that had imposed export restrictions and import quotas to maintain domestic supply and the availability of certain essential food items in response to a prolonged drought. Measures imposing price controls on essential services or goods were reported in several TPRs, as well as support measures for farmers and fishermen, and MSMEs. Measures to boost resilience such as the purchase of drought-resistant varieties of food crops, updating of food security laws, new public stock holding for food security schemes, mandatory insurance coverage, and the maintenance of foreign exchange reserves were also reported.
1064. A second report was presented by Giovanna Adinolfi, Professor, University of Milan. It focused on a legal mapping that explored the scope under the WTO Agreements for Members to take measures in support of disaster response, recovery, and resilience.
1065. WTO rules had been drawn with commercial cross-border transactions in mind. However,



- the scope of rights and obligations under WTO Agreements covered both commercial and non-commercial exchanges e.g. disaster relief. In disaster response, the primary concern was to facilitate the availability of both goods, equipment, services, and personnel to provide immediate assistance to an affected community.
1066. Professor Adinolfi explored the many ways in which trade measures under WTO Agreement can support disaster response, with particular reference to the Trade Facilitation Agreement (TFA). Simplification of customs processes and procedures under TFA for regular commercial transactions could generate positive impacts by speeding up and facilitating the entry of relief goods and equipment. Measures included pre-arrival submission of documentation and release of goods prior to the final determination of customs charges. Moreover, rights and flexibilities under GATT 1994 could justify the (discriminatory) suspension of customs charges on the entry of relief items, therefore lowering the costs of foreign and international assistance for certain actors. Other important provisions concerned provisions on traffic in transit and border agency cooperation. Provisions on transit were of particular value for landlocked countries hit by natural disasters.
1067. Disaster-affected countries frequently found themselves caught between two opposing forces. One was the need to facilitate the immediate entry of relief items. The other was the obligation to control the quality and the safety of these products (in accordance with the TBT and SPS Agreements). Basing national measures on international standards (where they exist and are relevant) could help to strike a balance between control and facilitation by speeding up conformity assessment procedures. Custom facilities and regulations designed with the purpose of accelerating regular commercial transactions would also have a positive impact on relief items.
1068. From a trade partner's perspective, concerns could arise over the quality and safety of products exported by a country in the aftermath of a natural disaster. As such, a disaster-affected country could need assistance to rebuild quality infrastructure and to demonstrate compliance with the technical regulations or sanitary measures of trading partners.
1069. Disaster-affected countries also needed access to goods of primary necessity. Access to food could be facilitated through both domestic and foreign programs. Domestic measures included Green Box measures under the Agreement on Agriculture, such as public stockholding for food security purposes and domestic food aid schemes. Trade partners could provide support through schemes that conformed with the terms of the International Food Aid Convention.
1070. Finding a balance between ensuring the competence of foreign relief personnel and facilitating their entry was a further consideration for disaster-affected countries – a point that referred to the provisions relating to recognition of foreign professional qualifications under the GATS. Services also played a role in facilitating access to financing. She noted the importance of mobile banking, services provided by banks and remittance services. Drawing the right balance was important because in some cases, regulations enforced to combat illicit or fraudulent practices (money laundering, tax evasion, corruption) created inadvertent obstacles that restricted access among disaster-affected populations to such services e.g. due to the withdrawal of correspondent banking services.
1071. Subsidies played an important role in the disaster recovery phase. Professor Adinolfi outlined how WTO Agreements dealt with this issue. Agriculture frequently suffered significant losses from natural disasters, and this issue was addressed in the Agreement on Agriculture through a series of Green Boxes. She also noted that a subsidy within the meaning of the SCM Agreement was only subject to WTO law if it was specific in intent. Schemes that were objective in criteria, neutral in application, economic in nature and horizontal in application, (e.g. subsidies to micro, small and medium enterprises) would not fall within the scope of the SCM Agreement. Professor Adinolfi also suggested that the trading partners of disaster-affected Members should give due consideration to the recovery and reconstruction needs of a disaster-affected Member before engaging in SCM consultations. She further recommended that trading partners should consider requests for financial assistance under bilateral and multilateral development assistance agreements.
1072. Provisions on prohibited subsidies also did not apply to LDC and some developing Members. Other subsidies only become actionable to the extent that other conditions set out in the SCM Agreement were satisfied. A Peace Clause on measures implemented by developing Members with a view to achieving legitimate development goals (2001 Ministerial Decision on Implementation-related issues and concerns) was relevant in this context. The question of whether or not the restoration of economic activities in a disaster-affected area qualified as a legitimate development objective was also important in this regard.
1073. Preference schemes benefitting eligible disaster-affected Members could support export recovery. In this context, she mentioned the 1979 Enabling Clause and the 2005 and 2013 Ministerial Decisions on Duty-Free, Quota-Free market access for LDCs. She also highlighted how exposure to natural disaster or vulnerability was being taken into account in the LDC graduation process though deferral of graduation.



1074. Professor Adinolfi mentioned the possibility to invoke balance of payments provisions under GATT 1994 to facilitate the reconstruction of an industry that has been substantially damaged by a natural disaster. To facilitate the entry of foreign products required for reconstruction, for example, it was also possible to suspend anti-dumping duties on imports of building materials. The disaster recovery phase could also involve subsidies for domestic services and services suppliers. While the GATS did not contain specific disciplines on subsidies, MFN and national treatment obligations in committed sectors still applied.
1075. Public procurement was crucial to guarantee the availability of goods and services needed for recovery. Concerns in this area included the need for prompt procurement procedures, absence of domestic suppliers for many goods and services, and the need to avoid price speculation. These issues were better addressed *ex ante*, first by ensuring that the general framework for public procurement could be used as efficiently as possible. In that regard, “framework agreements” and special rules and procedures for emergencies were useful tools. She also highlighted the flexibilities provided for by the revised Government Procurement Agreement in disaster situation.
1076. Trade rules also have a role to play in resilience by reducing disaster risks and losses through the implementation of measures that prevent and reduce hazard exposure and vulnerability. With regard to trade in goods, the implementation of TFA and the IFRC Model Act were of relevance for customs and other border agency performance.
1077. Professor Adinolfi highlighted the role that the Technical Barriers to Trade (TBT) Agreement would play in promoting the concept of “Build Back Better”. Basing measures on performance criteria, rather than prescriptive characteristic as per Article 2.8 of the TBT Agreement would help support this approach.
1078. For Members whose agricultural sector suffer persistent natural disaster damage, resilience could be promoted in accordance with Green Box provisions through the provision of general services, investment aids, environmental programs, participation in income safety net programs, etc.
1079. To improve resilience in the area of services, mutual recognition of professional qualifications through agreed criteria was one option. Disaster preparedness also required critical services such as insurance and reinsurance services, and telecommunication services, among others. She stated that there was scope to consider further liberalization of these services. Weather-related services were also important in that information enabled individuals, households, businesses and governments to take decisions which reduced the impacts of natural hazards. Policy dialogue in this area could examine the implications on import policy for hydro-met equipment and trade-related IP aspects, the role of public bodies under both GATS and Revised GPA, issues related to observational data, weather-related services and environmental services.
1080. In her concluding remarks, Professor Adinolfi drew attention to the wide range of actions that can be taken in the context of trade and natural disaster across a broad section of WTO Agreements.
1081. Concluding the remarks in this segment, the moderator, Shishir Priyadarshi, Director, Development Division, highlighted the pressure on public resources generated by natural disasters. International organizations and trading partners had a central role to play in the recovery phase. In an integrated world, the impact of a natural disaster in one country could propagate to others. He stressed the value of working towards a collective good in this area.

Session 2: Presentations by discussants

1082. Vyara Filipova, Technical Attaché, World Customs Organization (WCO) explained that customs authorities were the first governmental service that humanitarian responders interacted with in a disaster situation. Customs was on the frontline of disaster response. Customs authorities also played important roles in recovery and resilience action too. Customs was frequently identified as a major bottleneck especially in the response phase of a disaster, but criticism was not always fair, not least since delays were often the responsibility of other agencies operating at the border.
1083. After a brief introduction of the WCO, she explained how the role of customs had evolved from simple revenue collection to that of protection of economic interests and the protection of society (e.g. from drug trafficking, firearms, environment, etc.). The scope of customs functions also now encompassed trade facilitation and the supply chain. WCO’s responsibilities included standard setting in the form of instruments, conventions, guidelines and compendia. Another function was capacity building which included technical assistance and cooperation with other international organizations.
1084. Ms Filipova noted that there was great pressure placed on government agencies of disaster-affected countries, including customs, to ensure that aid reached victims in a timely manner. International humanitarian response had historically been managed by UN agencies. While the UN was still active, it had now been joined by a large number of NGOs and other actors that did not regularly interact with customs – a situation that created risks for both parties. A particular issue in this regard was unsolicited bilateral donations. It was essential that a Member requesting international assistance come up with a list of



priority items. This would help the humanitarian responders understand what type of items were needed. It would also assist government agencies, including customs, in identifying items that should be given priority attention.

1085. Another relevant issue was a lack of relevant knowledge and experience on the part of some humanitarian operators. Customs clearance issues could arise due to poor documentation. Simplified procedures were designed to ensure a speedy delivery of relief consignments, but sometimes these procedures were misused. Customs also faced challenges in having to enforce legislation on behalf of other government agencies – which underscored the benefits of coordinated border management.
1086. WCO had developed several instruments to address these issues. These included a chapter on relief consignments and facilitation measures in the revised Kyoto Convention. In 2011, a resolution had been adopted on the role of customs in disaster relief, that included provision for cooperation with UNOCHA and the International Federation of Red Cross and Red Crescent societies. Another recent initiative was the C-RED (Customs for release of epidemic diseases) project, which addressed epidemic outbreaks (e.g. Ebola in West Africa). WCO also had tools and initiatives focusing on border management, such as the SAFE package that included trade recovery guidelines. Tools on business continuity planning were also available.
1087. Pierre Sauvé, Senior Trade Specialist, World Bank Group, highlighted the importance of ensuring coherence by looking at natural disasters from a trade perspective. Coherence was needed for countries to be able to anticipate, mitigate, withstand, and then recover from the increasing proclivity of natural disasters. This was the logic behind the WTO's research work. There was a need to ensure that the international community put in place the proper co-operation mechanisms, dialogue channels, and alert systems to ensure timely and supportive response.
1088. For trade to play a supportive role in natural disasters, markets had to be open. Trade openness was at the core of resilience. Trade could play a very significant role in scaling up resilience by ensuring that countries have at their disposal building materials and engineering techniques that were adapted to the hazards they faced. Trade was not only about exporting, but also importing because an economy could not produce everything it needed. In situations of natural disasters, access to imports assumed even more critical importance, especially for countries who had vulnerabilities and exposure to recurring risk. Trade openness was needed to restore normalcy.
1089. There were many flexibilities available in WTO Agreements. Flexibility was linked to the exercise of policy space and special and differential treatment in the form of exemptions from WTO rules. Flexibility in the context of a disaster needed to be viewed in a slightly different way though not least due to urgency. Such flexibility could include temporary liberalization. This was a way to signal commitment, albeit temporary or exceptional in nature, that commensurated with the need to handle the challenge of imports to remedy both physical and infrastructural damage.
1090. Situations of natural disasters sometimes called for flexibilities. There were provisions in the loan agreements that World Bank accords its borrowers to draw down on funding to have quick disbursements in situations of extreme need. Building the ability on the trade side was incumbent on the financial response that the international community provided to countries which experienced these challenges. Many developing countries in recent years had seen debt levels increase given access to capital markets at very low interest rates – a phenomenon which had soon been followed by an economic crisis.
1091. The financial community had been creative in developing all sorts of instruments that would help countries anticipate and mitigate the hazards. There had been significant financial innovation in recent years. For economic agents in disaster-at-risk countries to be able to access these resources, there had to be some degree of openness and financial market liberalization, some degree of access to services, and a degree of prudential regulatory capacity to allow services to be used. The World Bank was working with its clients to promote economic diversification so that when a natural disaster hit, the economy had more resilience.
1092. Natural disasters were often caused by a lack of resilient infrastructure. Power shortages occurred regularly in developing countries. These power outages hampered economic activity. It was important to focus on resilience not only against large natural disasters, but also more frequent lesser impact events. The return on investment was calculated by the World Bank at four dollars of net benefits generated for every one dollar invested in resilient infrastructure. In conclusion, Mr Sauvé called on the global community to work together by investing in resilience.
1093. Irina Zodrow, Programme Officer, United Nations Office for Disaster Risk Reduction, recalled remarks made by UN Secretary General that little undermined development like a disaster. For many of the world's poorest countries and most vulnerable communities, disasters continued to reverse development gains, undermine resilience, exacerbate inequality, and curtail prospects for economic growth. She quoted IMF research in explaining why climate risk was a priority. In entering the age of adaptation and disaster management, the right investments would deliver triple dividends by averting future losses, spurring



economic gains, and delivering social and environmental benefits to everyone, particularly those currently affected and most at risk.

1094. There was currently no system in place to accurately account for disaster losses. For example, slow onset disasters were not necessarily reflected in statistics. Current statistics did not fully capture what was happening, and underestimated losses. Natural disasters were not only a developing country issue. She highlighted that insurance companies in New Zealand now refused to provide insurance in certain locations due to changes in the risk landscape. She noted the importance of correctly accounting for hidden externalities that are caused by risks in the trading system. This requires continuing efforts from the World Bank, the WTO and the IMF. The task force for climate-related financial disclosure was starting to examine ways to make risk more transparent. Financial regulators were calling for more risk mitigation measures.

1095. She stressed the importance of moving from a response-based to a prevention-based approach that considered climate and disaster risk comprehensively. The Sendai Framework aimed to strengthen resilience to ease the negative effects of natural and man-made hazards. An innovative approach was needed because data on past events was no longer a good indicator of future risk. With risks becoming systemic in nature, it was critical to make risk-informed decisions and investments. Rising disaster losses risked exceeding what feasibly could be afforded. However, at the same time, current policies, institutions, and financing were still looking mainly to prepare and respond to disasters rather than reduce losses. A reactive approach would lead to perpetuation of disaster risks.

1096. The Sendai Framework was a global blueprint for risk reduction, with the goal to prevent new and reduce existing disaster risks. The Framework included targets to reduce global disaster mortality, the number of affected people, direct economic loss in relation to GDP, damage to critical infrastructure and disruption to basic services. It also targeted an increase in the number of countries with national and local disaster risk reduction strategies, and greater availability of multi-hazard early warning systems. National strategies should be developed coherently, taking into account disaster risk reduction, climate change adaptation, and trade. Ninety trillion US dollars would be invested in infrastructure by 2030 with 70% expected to be channelled into low and middle-income countries whose societies and economies were typically more exposed to climate and disaster risks. She reiterated the need to ensure that this investment was risk-informed. She also emphasized the value disaster risk reduction had since disasters often struck across national boundaries. She suggested continuing

the dialogue to examine how trade could help disaster risk reduction.

Session 3: Comments on the research

1097. The representative of Barbados stated that the research was essential for small island developing states. The delegation sought further clarification on the different ways the WTO could help strengthen the resilience phase of disaster risk management.

1098. The representative of Mozambique shared some insights into the long-lasting impacts of the natural disasters that had hit her country. These were compounded by a lack of capacity and resources needed for reconstruction. She noted the rise of natural disasters in recent years and the economic losses incurred. To that end, her delegation supported an open rules-based trading system which could support resilience in the face of natural disasters. She suggested continuing discussions to find ways at the WTO to tailor trade policy measures to support disaster risk reduction. Technical assistance was needed to help disaster-prone countries take substantive measures given their limited capacity. One suggestion she made was to organize national and regional workshops to engage stakeholders, including governments and the private sector, to raise awareness and support work in this area. She encouraged donors to allocate resources so as to extend the work to other disaster-affected countries and to disseminate the research results.

1099. The representative of Bangladesh expressed appreciation to the WTO for organizing the Symposium. His comment related to the complementarity of technology transfer and critical services for disaster risk management in the context of the TRIPS Agreement.

1100. The representative of Vanuatu thanked Australia for funding this initiative. He highlighted issues identified in the research including on recovering trade losses from natural disasters, debt management, and ensuring that trade rules were supportive to reconstruction. He recalled the importance of building resilience through the adoption of standards, enforcing building code and fostering greater cooperation across agencies. Responding to the challenges of natural disasters in a trade context, the delegation suggested exploring the possibility of amending GATT Article XX and the Subsidies and Countervailing Measures Agreement so as to allow subsidies needed in certain sectors for recovery. Other areas he suggested to explore included the possibility of adopting waivers or deferral of the WTO Membership contribution, and to revisit the idea raised by Bangladesh on technology transfer in relation to Article 66 on TRIPS. His delegation placed an emphasis on ensuring WTO rules did not stand in the way of the reconstruction process.



1101. Speaking on behalf of on behalf of CARICOM, the representative of Trinidad and Tobago underscored the serious threat that natural disasters pose for Caribbean economies. He recalled the devastating impacts of Hurricane Dorian on the Bahamas. Even though the hurricane season was drawing to a close, CARICOM Member States remained vulnerable to external shocks and the negative impacts of climate change. The delegation welcomed this initiative and the legal mapping undertaken to better understand the scope currently exists in WTO agreements to allow Members to take measures in respect of disaster response, recovery, and resilience. The delegation reiterated the need for the existing eligibility to be maintained and expressed concern at proposals to tie future special and differential treatment to the metric of per capita income. Given CARICOM economies' vulnerability to exogenous shocks, he raised concerns about the high level of debt, eligibility for concessional financing, and underscored the continuing need for special and differential treatment. The delegation recalled the proposal made by CARICOM for the full flexibility of the multilateral trading system to be granted for reconstruction measures by disaster-affected Members.
1102. The representative of Jamaica commended the WTO on the Symposium. His delegation shared some insights into the economic damages borne by Jamaica after Hurricanes Ivan and Dean, which had left a devastating impact on tourism, agriculture, and industry. Given the importance of trade to Jamaica's economy, the delegation reiterated its support for the multilateral trading system and highlighted the importance of the link between natural disasters and trade. He highlighted the need for special and differential treatment, adapting trade measures (e.g. TFA, GATT) to facilitate entry of relief goods and services, low cost and flexible financing, climate financing, investments in renewable energy, collaboration with the private sector, further support from development financing partners, and fostering greater synergies across different international organizations in this area.
1103. The representative of Australia highlighted the wide scope under WTO rules for disaster-affected Members and their trading partners to respond and recover from natural disasters. Since the Pacific was one of the most disaster-prone regions globally, Australia actively engaged with its neighbouring countries and used its development assistance to increase resilience. There was potential to advance policies which supported disaster resilience and mitigated the impact of disasters before they occurred. He underlined a few messages emerging from the report including the importance of customs cooperation, prompt clearance of goods, compliance with international standards, mutual recognition of services' qualifications, pre-establishment of measures to respond to disasters (e.g. through waivers on relief goods). This research also highlighted areas where further work in the organization or elsewhere might be relevant. He encouraged Members and other stakeholders to build on the research work, including through technical assistance and Aid-for-Trade programs.
1104. In reply, the panellists provided comments on the role of different stakeholders (private sector, regional development banks, etc), technology transfer (especially in backbone services sectors) and public-private cooperation. The speakers supported continued efforts to make the case on why trade plays such an important role in resilience. Concluding the Symposium, the moderator, Michael Roberts, highlighted that it was now for WTO Members to decide if and how to take the research insights forward.
1105. **Disclaimer:** This is an informal report of the Symposium prepared by the WTO Secretariat. The opinions expressed are not intended to represent the positions or opinions of the WTO or its members and are without prejudice to members' rights and obligations under the WTO.



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