



THE ROLE OF TRADE IN THE GLOBAL AGRI-FOOD SYSTEM

SYMPOSIUM PROCEEDINGS

27-28 JUNE 2019



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Overview

The future of the global agri-food system will be shaped by climate stress and resource depletion, digital and technological innovation as well as evolving consumer preferences. To keep pace with demographics and the growing demand for affordable, safe and nutritious food, policy makers will need to develop strategies that promote economically, socially and environmentally sustainable agriculture and agri-food systems.

Climate stress and resource depletion pose serious threats to agriculture systems. The increased likelihood of extreme weather events makes agricultural production less predictable and global markets more volatile. Technological innovation has the potential to address some of these risks and help build resilient agri-food systems, particularly in structurally-disadvantaged rural areas. The agriculture sector has adopted new technologies more slowly than the industrial sector. However, recent developments in satellite imaging, climate-smart agriculture practices, precision farming and digital connectivity appear to indicate that the uptake of innovation is accelerating.

Governments have traditionally intervened using border measures and support mechanisms to protect rural incomes and livelihoods. Faced with new risks, many governments have started implementing whole-farm management approaches using state-of-the-art information and communication technologies (ICT) to optimise returns on inputs, while improving the resiliency of agricultural systems. Policies that restrict the choices of farmers or create inflexible incentives for farmers to choose types of production will limit the ability of the agri-food system to adapt in response to new stresses and new opportunities. Thus, it is important that governments consider how their policy interventions will enhance or restrict the flexibilities, especially in a world where there is increased uncertainty.

To contribute to a global dialogue on how to collectively meet pressing challenges in the agriculture sector, the World Trade Organization organized a symposium "the Role of Trade in Global Agri-Food Systems" on 27 and 28 June 2019. Experts from academia, international organizations, and think tanks discussed the trends and future expectations of the global food and agriculture economy and the implications for farmers and agribusiness. This symposium looked at governments' implementation of agriculture policies with a view to highlighting the trade-offs associated with specific policy decisions. Speakers identified opportunities and challenges for public sector intervention to create a more resilient and sustainable agri-food system. The symposium began with a session devoted to an examination of future trends in production, trading patterns and agriculture policies. The second session examined the role of border measures, including tariffs and non-tariff measures in the policy objectives of countries and how these measures impact on trade. The third session focused on domestic support and how domestic policies can be tailored to allow limited public funds to be used for investments for sustainability and resilience while minimizing distortions to production and trade. The fourth session focused on identifying policy strategies that could be used by developing countries with small agricultural sectors to manage their unique challenges.

The full set of presentations is available at:

https://www.wto.org/english/tratop_e/agric_e/symposium_ag_agri_food_system_e.htm

SESSION 1

Understanding the role of trade in global agri-food systems

Moderator

Lee Ann Jackson, Agriculture and Commodities Division, WTO

Panellists

- **Annelies Deuss**, OECD
- **Baris Karapinar**, Independent Advisor
- **Fousseini Traore**, International Food Policy Research Institute

Discussants

- **Tassos Haniotis**, Director for Strategy, Simplification and Policy Analysis, DG AGRI-European Commission
- **Alexander V. Daniltsev**, Director Institute of Trade Policy, Russian Federation

While global agricultural production is on track to meet rising demand, the agri-food system faces threats, including from climate change and resource degradation.

The impacts associated with changing climate will vary. For example, in 2018 some regions faced major tropical storms that caused billions of dollars of losses worldwide. Other parts of the world experienced months of prolonged lack of rain, with the number of record setting dry months increased by about 50 per cent in sub-Saharan African in 2018. These types of events can lead to shifts in the location of agricultural production. Trade can play an important role connecting different parts of the agri-food system so that farmers receive the right signals to adjust to global conditions and food and agriculture products can move from surplus to deficit areas.

This session examined how trade contributes to moderating negative outcomes from potential risks, including increased frequency of extreme weather events, resource degradation, and food insecurity. The panel highlighted some of the ways to address risks of climate change, variation in inter and intra-regional trade flows and policy tools that could build system resilience and ensure food security.

Global agri-food systems: past trends, market outlook and prospects for future reforms

Annelies Deuss, Trade and Agriculture Directorate, OECD

Annelies Deuss noted key developments in agricultural markets since 2000.¹ Looking at percentage changes in several agriculture indicators between the time periods *1990-2000* and *2001-2014/16*, Dr. Deuss noted that the long-term declining trends in food prices in the early 2000s had been reversed during the food price crisis in 2007-08 and 2011. Agriculture production had been increasing during the periods examined. An increase in market access facilitated by reduction in tariffs for agriculture and food products had led to increased agriculture trade, particularly in the period of 2001-2014/16. While there had been reduction in tariffs on many agriculture commodities, agricultural tariffs remained higher than tariffs on industrial products. The developing and emerging economies played a larger role over time in agriculture production and exports, notably in Asia and South

¹ Numbers updated from OECD (2016), *Evolving Agricultural Policies and Markets: Implications for Multilateral Trade Reform*, OECD Publishing, Paris.

America. Developed countries experienced stable growth which, given the growth in certain developing regions, meant that over time developed countries share of global agricultural production declined.

The OECD's Producer Support Estimates (PSE) indicate that progress was made in reforming government producer support programmes in the early 2000s. However, some countries continue to provide production distorting support, concentrating government spending on subsidising inputs or providing market price support instead of investments to create an enabling environment.

Due to reforms in domestic policies and technological advances, trade in agro-food products is increasingly organized in global value chains (GVCs). Between 2004 and 2014, the agro-food sector became increasingly integrated and deeper links developed between agriculture and other sectors, including the services sector. Globally 24 per cent of agro-food export value comes from foreign factors that are imported. Countries that add tariffs to the inputs, end up taxing their own exports. The policies such as tariffs, distorting support, non-tariff measures (NTMs) and services trade restrictions reduce GVC participation. Measures taken to promote growth in domestic value added in GVCs can improve access to new markets and increase productivity gains from technological spillovers along the supply chain. Therefore, it is important to recognise and adapt policies that reduce or increase participation in GVCs policies to create enabling environment for agriculture trade.

While NTMs can facilitate free flow of goods by increasing consumer confidence through greater quality of goods, they also lead to increased trade costs for most countries. An OECD study estimating price effects of NTMs such as SPS, TBT, border control measures and QRs showed that price increasing effects of the NTMs were mainly associated with SPS and TBT measures and were higher for agriculture and food commodities compared with other products.

In presenting the outlook for world agricultural markets, Dr. Duesend noted that due to strong supply and slowdown in demand growth, agriculture prices would remain slightly below their real terms in the next decade. While demand growth has slowed in the current decade for many agriculture and food products, strong population growth in India as well as per capita income growth would translate into higher expected demand for dairy products. However, in terms of agriculture production, OECD modelling predicted an increase in the next decade compared with the previous decade due to production growth in India, Africa, and Latin America facilitated by technological growth.

Given the demand and supply trends mentioned above, trade patterns were expected to reflect regional comparative advantage. There could be an increase in exports from countries with more resources and relatively low population pressure (Europe and Americas) and imports will likely increase in the regions with scarce water resources and high population (Africa, south and east Asia). Other factors contributing to these shifts include changes in consumer preferences and outbreak of animal and plant diseases, health policies, bio-fuel policies and uncertainties in regulations disrupting technology transfer and adaptation.

Past reforms of trade and domestic support policies and developments in agricultural markets have increased the integration of the world agro-food system. Countries gain when their agro-food systems participate in GVCs. In addition, when countries implement trade and domestic support measures that restrict trade or unnecessarily increase the costs of trade they harm their own economies, as well as those of their trading partners. Furthermore, these policies create political pressure for government intervention which may lead to the diversion of scarce budgetary resources away from essential investments.

In conclusion Dr. Duess noted that countries could benefit from structural policy reforms and increase the competitiveness of agro-food sectors by reducing agricultural support and market access barriers that distort trade; by ensuring that NTMs are appropriate, transparent, science-based, and by reducing unnecessary trade restrictions and barriers to services trade. Multilateral efforts to reform trade and trade policies remain an important mechanism to harness benefits and maximise growth and resilience.

International trade under climate uncertainty

Baris Karapinar, Independent Advisor

In presenting the effects of climate change on agriculture, Dr. Karapinar referred to a study² that measured effects of climate change on cereal yields and showed the diverse impacts at the regional level. In some regions the study showed that climate change could have a positive yield impact due to increased availability of water or increased productivity due longer growing seasons. Other regions could face yield losses of up to 50 to 100 per cent. In the long run even the regions that benefit from climate change due to increased growing length of cultivation period may lose out due to increased temperatures. The study showed a potential climate related price increase of up to 85 per cent for some products due to changes in production patterns.

Analyzing the impact of climate change on trade patterns, Dr. Karapinar noted that countries with comparative advantage in specific traded commodities were the most affected by extreme events. Countries may use trade policy adjustments, such as export restrictions, to respond to climate shocks to production, adding to the risky environment.

Results from a study on wheat markets described the implications of weather and climate change on economic welfare. These results indicated that yield volatility in the wheat market had been higher during more recent time periods due to climatic variations. Some countries such as Nigeria and Australia had experienced higher yield volatility over last 50 years. Russia, Kazakhstan and Ukraine had a higher share of wheat exports and had experienced higher productivity volatility on average.

The study analyzed the distribution of extreme risks by scrutinizing changes in overall global and county level welfare. The overall welfare risk related to climate induced shocks on wheat had increased 30 per cent between 1963 and 1983 and had increased an additional 25 per cent between 1983 and 2012.

The study also examined yield correlations among countries, observing strong positive correlation among Eastern European countries with high overall productivity. For some other countries, yields were negatively correlated. When a country has yields that are positively correlated with the rest of the world this means that when the rest of the world is experiencing low yields, these countries also experience negative impacts. This type of situation could have important implications for countries that depend upon imports. Alternatively, some countries, such as the US, Canada and Argentina, have yields that are negatively correlated with the rest of the world. This implies that these countries can expect increased exports when yields in the rest of the world decline. These types of correlations provide important context for policy makers seeking to choose trading partners to reduce risks from climate impacts on crop yields.

Climate change could also have nutritional implications depending upon impacts on traded commodities. For example, considering effects of both productivity shocks and export restrictions, modeling results showed climate change affected households in countries such

² Unal, G., B. Karapinar, and T. Tanaka (2018) Welfare-at-Risk and Extreme Dependency of Regional Wheat Yields: Implications of a Stochastic CGE Model. *Journal of Agricultural Economics* 69(1): 18-34.

as Iran, Morocco and Kazakhstan regardless of whether the country was a net food importer, net wheat importer or net wheat exporter. Furthermore, a country with high per capita consumption for wheat, high trade per capita and high production volatility, like Morocco, would be exposed to welfare related shocks both at domestic and global level.

In conclusion, Dr. Karapinar highlighted that trade policies are important tools for managing risk and promoting adaptation. Additional food deficits due to climate change could be addressed through trade from surplus regions. The number of people who need emergency food relief was likely to grow. By bridging demand and supply, trade could play an important role in climate change adaptation. Measures and trade policy adjustments such as stock piling, regional risk pooling, optimizing cropping patterns and adjusting trade patterns could also facilitate risk management to address impacts of productivity shocks.

The potential contribution of trade in food security

Fousseini Traore, International Food Policy Research Institute (IFPRI)

Dr. Traore shed light on how trade could enhance food security in developing countries, with a particular focus on the African region. Trade could contribute to many dimensions of food security including food production, access, and utilization by linking deficit areas with surplus regions. Moreover, trade was also likely to stabilize domestic markets and increase availability of food. However, in the wake of the 2008 food crisis the reliance on trade had been questioned due to the impact of restrictions imposed by large food exporters. Dr. Traore stressed that while countries integrated in global markets may experience the impact of global shocks, trade enables reduced transactions costs, foreign exchange availability, and diverse diets.

IFPRI research showed that for most countries, national production volatility was considerably larger than volatility at the aggregate regional level. Volatility differs among countries within African regional trade agreements such as SADC and ECOWAS. Some countries, such as Malawi, Mauritius, Rwanda, Sudan, Swaziland, Zambia, and Zimbabwe, have experienced high volatility while others, such as Kenya and Madagascar, have experienced moderately volatile production levels.

While large food suppliers typically implement export restrictions to guarantee availability and low and stable prices for domestic consumers, export restrictions may have significant impact on small net importing countries. An IFPRI study on wheat market in West Africa showed that welfare in West Africa decreased by 0.10 per cent when net wheat exporters imposed export taxes. The negative welfare impact was twice as large when net importing countries reduced import duties at the same time net exporters increased export taxes.

Climate change leads to shifts in comparative advantage and the distribution of production which may increase price volatility. In this context, trade has a potential to dampen negative impacts by delivering goods to areas with declining productivity and reducing price volatility. Results from a study³ which simulated the impacts of climate change with and without trade adjustment showed that world welfare could be reduced by 1.36 per cent without trade adjustment and by 0.58 per cent with trade adjustment (-6.35 per cent and -0.63 per cent respectively for Sub-Saharan Africa).

Dr. Traore noted that trade could act as a 'double-edge sword' for food security. Trade could increase the availability and diversity of food items and the resilience of domestic food markets to supply and price shocks. However, non-cooperative trade policies in periods of food crisis could exacerbate negative impacts for small net importing countries. Therefore, countries needed to increase efforts to cooperate at the global level and achieve

³ Gouel & Laborde (2018)

greater trade integration to mitigate negative impacts of climate change and enhance food security.

Discussants

Tassos Haniotis, Director for Strategy, Simplification and Policy Analysis, DG AGRI-European Commission.

Food, Climate, Trade: global challenges and their implications in the food policy debate

Dr. Haniotis focused on challenges related to shifts in demand and supply side. He noted the pressures on production due to climate change, while at the same time recognizing that new technologies could support the production of economic and environmentally friendly commodities. The challenges in the food system increasingly reflect competing and contradictory shifts in consumer choices. The shifts in consumption patterns are not homogenous in regions or even within specific countries. The differences may be due to variation in consumers' knowledge on how new technologies are applied, to income variation among consumers, or to changing consumer perceptions on the role of science.

Dr. Haniotis remarked that farm policy discussions should focus on climate and environmental issues. Achieving more economic and environmental efficiency and ensuring equitable distribution of benefits from trade would require a fundamental change in mindsets.

Alexander V. Daniltsev, Director Institute of Trade Policy, Russian Federation.

Dr. Daniltsev noted the need for progress in the agriculture negotiations at the WTO recognizing that the multilateral body as the only platform to ensure international trade regulations. Policy makers needed to account for the significant structural changes in markets since early 2000s due to technological advancement and investment. He noted that in order to optimize the gains from the markets, it would be important to phase out trade distorting policies.

Discussion

Responding to a question raised on reasons for slowdown in demand growth, Dr Deuss noted the increase in per capita demand growth in the next 10 years would be lower compared to the past. This decreased demand would drive the expected slowdown in the next decade. This slowdown was due to the saturated per capita demand growth in emerging economies and economic slowdown in China. In the future, demand would be driven more by population growth.

Dr Traore highlighted challenges and priorities in finding better data for regional trade in Africa, particularly while looking at climate change effects, income growth and regional trade agreements. Gravity models to predict trade flows could potentially underestimate true trade flows due to data limitations. Hence, there was a need to carry out more surveys on ground.

In the context of government support and subsidies, a participant sought clarification on whether it is useful to think of support through Amber, Green and Blue Box categories, particularly when evaluating impacts of GVC development and potential risks from shocks of climate change. The speaker noted that gains could come from diversification and removing barriers between consumer and producers. Dr Haniotis noted that for the Amber Box, governments could adjust their support to have more flexibilities in exchange

for battling food production deficits and climate. However, there was a need for policies that could facilitate this adjustment for farmers to be efficient economically and environmentally. Research innovation and transfer of knowledge could contribute towards sound and coherent policies regionally and internationally.

SESSION 2: INTEGRATING AGRICULTURAL MARKETS - IMPACT OF BORDER MEASURES

Moderator

Christiane Wolff, Agriculture and Commodities Division, WTO

Panellists

- **Ralf Peters**, UNCTAD
- **Christine Wieck**, University of Hohenheim
- **Janine Pelikan**, Thünen Institute
- **Olayinka Idowu Kareem**, Trade and Development Policy Network

Discussants

- **Jason Hafemeister**, Trade Counsel to the Secretary at the U.S. Department of Agriculture.
- **Phil Houlding**, Director for Policy and Trade at the Ministry for Primary Industries.

For agri-food systems to be able to respond dynamically to changing conditions, the links and signals between stakeholders need to be clear. These are important to encourage market integration at the local, regional or international level. Removing distortions at the border, whether multilaterally or in the context of RTAs, increases transparency and allows farmers to take production decisions based on clear market signals. Tariffs and non-tariff measures (NTMs) determine which products can move across the border. If poorly designed, border measures may impose unnecessary costs on traders and often pose significant challenges for smaller producers. This session focused on the prevalence of different types of border measures and their implications for policy formulation, including from the global value chain and RTA perspectives.

The 2019 G20 trade monitoring report showed that trade coverage of new import restrictive measures was more than 3.5 times the average of 2012. There had been a dramatic spike in trade coverage of import restrictive measures. The estimated ad valorem equivalent (AVE) of non-tariff measures (NTMs) by the OECD was twice that of tariffs. While NTMs are very diverse and some can enhance trade, NTMs can also raise trade costs. The discussions under this session looked at circumstances under which trade takes place and policies that shaped trade flows.

Understanding the impact of non-tariff measures

Ralf Peters, UNCTAD

Ralf Peters noted that the United Nations considered trade to be an important tool to achieve of the Sustainable Development Goals (SDGs), particularly goals of ending hunger, achieving food security and improved nutrition and promoting sustainable agriculture. The UN also considered trade to be important to achieve the economic, social and environmental objectives.

Trade costs could have significant impact on market integration. Some costs, such as those related to distance or language, could not be influenced by policies. Other types of costs were associated with policies chosen by governments. Regulations, such as TBT and SPS measures, conformity assessments and other NTMS, could have a significant impact on trade. The way these regulations were implemented may represent procedural obstacles. Transport and private standards also had an impact on trade costs.

Tariffs have decreased over time while the use of NTMs has been increasing. Looking at disaggregated data, SPS and TBT have had the biggest impact on agricultural products. For vegetable products, nearly 20 per cent of costs have come from SPS measures. Members seeking to export fresh products to the EU could face several regulations defining specific product requirements even though tariffs could be zero.

Two categories of NTMs exist: (i) traditional trade policy instruments whose purpose is to have an impact on trade, and (ii) regulatory and technical measures which stem from non-trade objectives. While the NTMs falling in the first category could be eliminated or reduced to reduce trade distortions, SPS and TBT measures typically have other policy objectives which means that elimination of these measures may not be a real option. Increasing transparency of those measures could reduce the trade costs associated with their implementation.

UNCTAD in cooperation with the WTO and other organizations had developed a classification of NTMs which facilitates analysis of complex NTMs. This classification included data on 177 NTMs. UNCTAD analyzed the regulations of a set of countries covering more than 90 per cent of world trade. This data had been disseminated to policy makers, researchers and the private sector.

NTMs are prevalent in agriculture trade and have significant impacts on trade flows. UNCTAD data indicates that NTMs are, on average, three times as costly as tariffs and that almost all trade in agriculture is covered by at least one NTM. For example, 98 per cent of traded vegetables face NTMs. On average a trader faces eight different NTMs for one product. The lower the average tariff in a country is, the higher the number of NTMs per product. Reducing the cost of NTMs through enhanced transparency and regulatory convergence, could create significant gains to trade.

**The long way to integrated markets:
SPS/TBT measures as a stumbling block to integrated agri-food markets?
Christine Wieck, University of Hohenheim**

Christine Wieck noted that SPS and TBT measures were often perceived as stumbling blocks on trade. Countries used many different regulatory measures and each measure may have a different impact on trade. For example, import bans would have a greater impact on trade than requirements to include comprehensive ingredient lists. The cost of compliance was most problematic for LDCs and small countries.

The initiation of trade relationships was contingent not only on market access conditions but also on domestic market conditions. Trade impacts typically diminished dramatically when traders have experience navigating complex requirements.

Regulatory standards could also expand production and trade, for example because consumers know that the product is safe. They could also improve national and international welfare by addressing information asymmetries. These measures provided first-mover advantage for companies as satisfying safety requirements enhances competitiveness.

The similarity of SPS measures across countries has helped foster agri-food trade. Similarity could be fostered through regulatory cooperation. Different stages of regulatory co-operation included national food safety level, coordination, equivalence, mutual recognition and harmonization which ends in the adoption of a single uniform system or standards across countries such as the EU common market.

The WTO's SPS agreement called for harmonization of standards at the level of consensus. A study by the OECD had found that few RTAs go beyond what was written in the SPS agreement. Half of the RTAs studies required the establishment of a joint SPS national committee. Most RTAs included generic mutual recognition commitments. This underlined the fundamental importance of the SPS committee to enhance the use of international standards.

A regulatory cooperation approach could foster trade. Looking at different approaches for regulatory co-operation for agri-food products, harmonization has had a significant impact on agriculture trade flows. Even improving transparency has helped to improve trade.

Governments could work on building capacity and trust, enhancing transparency, improving information exchange, learning about food safety systems, engaging in continuous dialogue and extending the scope of existing SPS committees. The experience of the EU market integration illustrated how regulatory mechanisms could evolve to limit negative impacts. Initially the EU started with joint products and marketing standards. When new regulations were adopted, they were required to align with the SPS agreement.

Businesses could also take actions to engage in regulatory cooperation. They could apply good agricultural practices and good manufacturing practices along the supply chain, work on reduction of post-harvest losses, seek to upgrade the product quality, advertise quality and safety products and advocate for an enabling environment for regional value chains and safe food.

Insights from the Thünen Institute of Market Analysis Janine Pelikan, Thünen Institute

Janine Pelikan focused on recent trade disruptions, noting that trade-weighted import tariffs were still high and in the last year trade-weighted tariffs had increased. Increased in tariffs would impact markets and country policies.

In June 2018, the US had increased tariffs by 25 per cent on USD 34 billion of imports and in August another 25 per cent on USD 16 billion of imports. These actions had led to a decrease in soybean prices in the US by 3.4 per cent, while for other countries the prices soybeans increased. In this period, China had also increased tariffs on a variety of products from the US. China increased tariffs on the most important product exported to China from the US. The US increased tariffs on almost all products, notably cereals, wheat, oilseeds and rice.

The tariff increases on soybeans had also coincided with changes in other policy areas. The EU commission had approved the import of US soybean that met the technical requirement for production of biofuels. The imports of soybeans from the US into the EU in the marketing year 2018-2019 had increased from 36 per cent to 72 per cent, while other countries lost their share of imports. This increase in tariffs also seemed to have influenced the long-standing hormone-treated beef case between the US and the EU. In June 2019, an agreement was reached between these two countries in which the EU had allocated 35,000 tonnes of a beef TRQ to the US.

New types of market risks had been emerging. At the bilateral level the power of influential states had increased. There were also environmental risks such deforestation related to increased soybean production. Tariff increases affected the distribution of benefits to interest groups which creates risks related to corruption. Given these diverse risks, the confidence in world agricultural markets had been decreasing. Importers would try to hedge against such risks. China's direct investments in agriculture and the food industry

increased tenfold between 2009 and 2016 and there had been a new wave of land acquisition in Africa and Asia.

Dr Peilkan noted that the EU's engagement in RTAs would have impacts on international markets. Most of the trade agreements of the EU had not been fully implemented and would be phased in over long implementation periods. Agriculture tariff protection would decrease within the framework of these agreements. The main liberalization took place at the beginning of implementation of these agreements. Concerning TRQs, in 2005 there had been only one TRQ in EU's RTAs, while in 2018 the number had increased to 155.

Border Measures and Africa's Agri-Food Trade: Export Markets Comparative Analysis

Olayinka Idowu Kareem, Trade and Development Policy Network

Olayinka Kareem focused on sustainable development in Africa. Africa has a comparative advantage in agri-food production, however border measures in and outside Africa limit Africa's market integration. Opinions diverged as to what undermines Africa's market access in agri-food trade. One school of thought considered that border measures in importing countries were responsible, while another considered that Africa's inability to satisfy quality requirements and produce adequate output explained Africa's limited exports.

The preponderance and stringency of agri-food border measures had implications for Africa. Evidence had shown that since tariffs had been declining, SPS measures were often the most used NTMs on agricultural products. The trade-limiting impact from NTMS could almost double the tariff effect for some products. Agricultural exports to the US and the EU faced a plethora of food safety requirements, state regulations, technical measures and non-technical measures. African farmers had difficulty complying with these measures due to inadequate science and technology, lack of institutional strength and education.

Intra-Africa trade-costs had been high, due in part to extensive documentation requirements. Despite this, intra-Africa agri-food trade had improved over time. NTMs inhibiting trade in Africa included hard border measures (transportation costs, poor infrastructure, port inefficiencies and weak institution); soft border measures such as technical measures (quality standard regulations); and non-technical measures (custom procedures, excessive document requirements, graft, poor logistics). African countries could enhance their ability to trade by accelerating the adoption of trade facilitating measures. Beyond the continental FTA in Africa, the continent could embark on policies and programs to eliminate or reduce informal cross-border bottlenecks to enhance intra-regional trade.

Major importers could modify their tariff and non-tariff border measures to facilitate trade with Africa. The EU could reduce tariffs on sugarcane, rice and cereal, reduce the use of the precautionary principle and eliminate path dependency/generic rejection in agri-food border rejections. The US could facilitate trade with Africa by synchronizing import requirements and reducing rules of origin requirements in AGOA.

Discussants

Jason Hafemeister, Trade Counsel to the Secretary at the U.S. Department of Agriculture

Mr Hafemeister noted signs of progress in market access, including an increase in trade and a decrease in trade barriers. However, sustained market access barriers created through tariffs and NTMs still need to be addressed.

NTMs complicated market access integration. One of the panelists had highlighted that several stages of regulatory cooperation were bilateral in nature. A big challenge was to determine how the WTO as a multilateral organization could facilitate these types of bilateral conversations. Many countries used the SPS agreement in their bilateral efforts. If the WTO could strengthen the SPS Agreement, all those countries who rely on this Agreement would benefit.

Harmonization could be the most efficient way to address tensions surrounding divergent SPS measures, however it touched on sensitive issues such as sovereignty. In addition, product differentiation driven by consumer preferences moved in the opposite direction of harmonization. Harmonization was an attractive principle, but it was elusive.

Efforts could also be made to address persistent high tariffs in agriculture. Value chains in agriculture were driving agriculture trade. More attention could be given to different systems of tariff preferences which could end up taxing exports.

Phil Houlding, Director for Policy and Trade at the Ministry for Primary Industries New Zealand

Phil Houlding recalled that when New Zealand liberalized agriculture in the 80's productivity increased. Agriculture had improved at a faster rate than the rest of the economy, and environmental outcomes had also improved. For example, the liberalization of New Zealand's wine sector led to the creation of the competitive wine sector in New Zealand and to a fully integrated wine market through a mutual recognition agreement with Australia.

Yet, barriers to trade continued to impede agricultural productivity growth in some sectors. For instance, the beef industry in New Zealand would need to adapt their processes 2,500 times to access different markets. Every change implied costs which reduce productivity. The cost of NTMs to the Asia-Pacific region had been calculated to be around 700 million dollars. Tariffs also negatively affected productivity growth in the agriculture sector.

Removing barriers would be critical to meeting global nutritional needs. Agriculture seemed to have missed out on gains due to the lack of liberalization. While bilateral efforts could help, there were also efficiency gains in addressing the challenge through multilateral efforts. A discussion from the perspective of global nutrition and the hunger challenge might yield a different answer to current challenges.

Discussion

A few themes emerged in the discussion. Speakers recognized that while the elimination of NTMs was not a credible option, harmonization and cooperation could help to address the trade frictions created by NTMs. Studies clearly demonstrated that bilateral or regional regulatory co-operation could lead to benefits for trade. Cooperation could also take place at the multilateral levels. For example, participation in the SPS committee provided Members with the opportunity to strengthen cooperation and transparency and to share interests and concerns on these issues. A multilateral approach that provided the space to discuss and solve issues could significantly amplify the potential gains from trade. At the same time, while harmonization was necessary in some situations, there should be flexibility to allow innovation and development of new approaches in the processing requirements.

Given that the role of global value chains in agriculture was expanding, rules of origin were becoming increasingly important. Many rules of origin were linked to SPS measures; if countries were not able to show that their products were produced in their country then

they are not able to benefit from existing preferential schemes. This leads to lower utilization rates of preferential systems.

Some regional approaches sought to address the trade frictions created by NTMs. For example, the African free trade agreement provided a tool for reporting, monitoring and eliminating NTMs. In this tool the standards from the three sisters had been coded and could be matched with the national regulations.

Work by the three sisters and the SPS Committee could facilitate changes that benefited all Members. For example, many countries had started to use the e-phyto hub system to produce certificates electronically with a view to multilateralize the use of the system. While it had been recognized that some NTMs create benefits, little work had been done to help understand these benefits. The three sisters were carrying out work on their respective standards to fill this gap. The SPS Committee was examining how to improve the implementation of the agreement, including, for instance, on pesticide regulation.

SESSION 3 - ANALYSING PUBLIC SPENDING IN AGRICULTURE

Moderator

Marlynn Hopper, Standards and Trade Development Facility, Agriculture and Commodities Division, WTO

Panellists

- **Carin Smaller**, Advisor on Agriculture and Investment, International Institute for Sustainable Development
- **Thierry Ngoga**, Alliance for Green Revolution in Africa
- **Krijn Poppe**, Wageningen Economic Research
- **Alejandro Acosta**, Livestock Policy Officer, Animal Production and Health Division, FAO

Discussants

- **Frédéric Seppey**, Assistant Deputy Minister from Agriculture and Agri-Food Canada.
- **Simon Smalley**, Minister-Counsellor, Australian High Commission.
- **Y. İlker Salar**, Head of Department, Ministry of Agriculture and Forestry, Turkey.

OVERVIEW

Diverse sets of policy options are available to governments to design and implement sustainable agri-food systems. The provision of public goods includes physical and digital infrastructure to connect rural sectors to local, regional and international markets. Governments also can invest in services that enhance agriculture productivity, for example by supporting research, extension services and food safety inspection. In the context of limited budgets, governments need to draw on a basket of policies used to support the agriculture sector to determine which policies are best suited to increase productivity, sustainability, resilience to climate change and other risks. This session looked at government support in agriculture, highlighting patterns of support and the impacts of different policy sets economic, social and environmental outcomes.

Transforming agriculture – A conceptual framework

Carin Smaller

Advisor on Agriculture and Investment, International Institute for Sustainable Development (IISD)

Carin Smaller presented a conceptual framework developed jointly by IISD and IFPRI to examine governments' policy and spending priorities. Her presentation was based on the paper titled "Transforming Agriculture in Africa & Asia".

The study first differentiated the stages of countries' agriculture development/transformation. A global clustering analysis of 117 countries over a 45-year period was conducted and six different transformation phases were identified: Industrialized Economies, Agriculture Integrated into the Macro Economy, Agriculture as a contributor to Growth, Moving Labour out of agriculture, Getting Agriculture Moving and Subsistence Agriculture.

A few observations emerged from the analysis:

- Many countries had made significant progress in terms of agriculture development in the last 45 years.
- The progress had been particularly strong between 2000 and 2015. In 1970 there were about 20 countries that were largely subsistence agriculture, in 2019 there were less than 6.
- There had been significant rise in the number of countries becoming "Industrialized Economies".

The study also considered the context in which the agriculture development took place, focussing on three indicators that were chosen based on their relevance to the agriculture sector and data availability: birth rate, available agriculture land and fertility of the land. The 117 countries included in the study were categorized into five different country contexts: Low Birth Rates and Scarce Land, High birth Rate and Scarce but Fertile Land, High Birth rates and Scarce Land, Abundant and Fertile Land, Abundant but Infertile land.

This study highlighted how countries in different contexts succeeded in moving towards more developed stages.

- Abundant agriculture land per capital, fertile agriculture land, high birth rates: Many Latin America countries who had been successful in transforming their agriculture sector in the last 45 years were in that category. However, quite a lot of African counties who had not yet succeeded in transforming their agriculture sector were also in a similar context. Many large Latin American countries with abundant and fertile land used agriculture as an engine for growth
- Scarce agriculture land per capita, infertile land, with high birth rates: Many East Asian countries such as China, Viet Nam were in this category. These countries succeeded not by using agriculture as an engine for economic growth but rather by encouraging labour to move from agriculture into industries or service sectors. Their policies and public spending focused on moving rural people to cities.
- Abundant agriculture land per capital with infertile land: Countries in this category used a mixture of policies, focusing on developing extensive agriculture production and producing for export markets.
- Scarce agriculture land per capital but highly fertile: This category included countries with a strong focus on improving productivity and developing niche markets, with complementary strategy of public spending to move people out of agriculture.

This work was based on the premise that lessons from the past could guide countries policy choices to develop their agriculture sector. The countries which had not been successful in moving from early phases of agriculture development could be inspired by successful cases of countries that were in similar contexts and identify where they could invest to expedite development. The study included policy recommendations based on an extensive literature review of over 200 studies on policy and public investments. The following conclusions were highlighted:

- To determine the policy priorities, it was important to look at the availability of arable agricultural land and birth rates.
- Price policies could play a key role. Countries should make sure that agricultural sector was not penalized compared to other sectors.

- Public investment in R&D, extension, electricity and irrigation should take priority.
- Land reforms, research institutions and improving access to credit are also critical.

Agriculture investment in agriculture. AGRA's experience

Thierry Ngoga, Alliance for Green Revolution in Africa (AGRA)

Thierry Ngoga focused on agriculture spending in Africa based on AGRA's experience in the 14 African countries AGRA supported.

Mr. Ngoga highlighted the current trends of agriculture public spending in Africa, highlighting evidence that when public spending in agriculture sector increased, poverty was reduced. One worrying trend was that the annual average change in agriculture spending had been negative across Africa. There had been a small increase in Central Africa, and for East Africa. Northern Africa was the only part of the continent where steady increases are taking place.

CAADP (Comprehensive Agriculture Development Programme) had set a target of increasing the budget allocated to agriculture sector to 10 per cent. None of the central, eastern, northern, southern and western part of Africa met this objective during 2003-2017. Among the 14 countries supported by AGRA, Mali and Malawi had exceeded the 10 per cent threshold. Proper allocation of budget and prioritization of the budget was crucial.

Governments faced many challenges. Investments in the agriculture sector had been low and the development budget was much lower than the recurrent budget. Prioritization was also a challenge. Policies had been motivated by political factors but not necessarily based on comparative advantage and a market-led approach. While prioritization should be based on evidence, public expenditure tracking had been limited due to difficulties in obtaining reliable data and information on expenditure.

Regarding the recommended policy interventions from the perspective of AGRA, Mr. Ngoga noted that policy formulation and implementation were key. The following components could be considered in order to have an enabling policy environment to support agriculture transformation:

- Policies should focus on countries' comparative advantages since country contexts vary;
- Policies should be balanced and adaptive between export and domestic-oriented;
- A market led approach is crucial and policies that are private-sector friendly are more effective;
- National agriculture investment plans should be easy to implement.

Additional policies could complement public investment in the agriculture sector. Public and private sector partnerships (PPP) were key to success in implementing government policies. Innovative financing mechanisms needed to support agriculture particularly those support small farmers. Making the right types of investments and targeting specific commodity policies in some cases was necessary. Coordinated investment and sequencing of interventions was also crucial. Investments in infrastructure and on training and capacity development would be essential to ensure successful implementation.

AGRA could assist countries with prioritizing agriculture public spending, ensuring that the prioritization of policies was market-led and based on countries' comparative advantage. AGRA listened to governments' problems and gave suggestions regarding how policies are implemented. AGRA also played a role in coordinating different partners and enhancing countries' capacity in building data systems.

Policy decisions in a food systems framework

Krijn Poppe, Wageningen Economic Research

Krijn Poppe discussed government interventions in agriculture from the perspective of food system and value chain. In the last century family farms had dominated the agriculture sector. Family farms had played a relatively small role in the food chain because many activities were outsourced to suppliers and food processing companies and cooperatives to create economies of scale. Some activities had been shared with semi-public organisations such as commodity boards and levy organisations. The government had also played an important role, promoting exports and improving research and development, extension, quality control and infrastructure including land reallocation. Family farming had been linked to public objectives such as food security and social support of farmers.

Governments intervene in the agriculture sector for many reasons, including non-perfect market conditions, information asymmetry and to support infant industry. Governments face diverse challenges in making the optimal policies. In some cases, domestic policies have international consequences. Exporters in other countries could be harmed. Optimal policies depend on stages of development and it may be difficult to judge what is the right policy for a specific context. Diverse players existed in the market including small self-sufficient producer, consumers and exporters.

Several recent changes had occurred in agriculture and food system. In the west, farms had become part of an industrialised food system. The food system had successfully improved labour productivity at the farm and in the kitchen, with big scale increases in the supply industry, food processing and retail and geographic concentration. This spatial concentration meant there were large agglomeration effects and potential marginalisation of remote rural areas.

Negative outcomes for environment, climate and public health had led to increased interest in stronger government interventions, not only addressing farmers and consumers but also the operation of the food system. For instance, one objective of the EU Common Agricultural Policy was to deal with climate changes and four policy options had been included in the CAP to meet the objective including regulating farming practices such as establishing an emission trading scheme, direct payments on the condition of meeting environmental objectives, longer term conservation contracts for nature management and eco-schemes aimed at sustainability.

These changes could also create additional challenges for policy makers. Policy makers needed to consider whether a soft approach in environmental policy could be seen as state aid benefiting foreign consumers but penalising foreign producers. Existing methods, models and data may need to evolve to deal with food system approaches. Increasingly the food system was blurred with other systems, such as energy. In this context, incentives for biomass and bio-energy production could support farmers but raised questions about whether these were optimal interventions in the energy market and whether these policies could hurt food consumers due to price effects?

Mr Poppe suggested that a change of approach was necessary to ensure that policies supported a resilient food system. Policy analysts had a challenge to determine the optimal policy mix, which depended on national institutions and the policy cycle. Policy choices needed to also be coherent with the needs of the broader system and recognize the forces that lead to market concentration. A more limited agricultural policy could give way to food policy which would address these systemic issues. The CAP Eco-schemes might provide an opportunity in this respect. Other policies such as those related to energy transition and climate change would interact with agriculture policies and these

interactions need to also be addressed. Methods, models and data in policy analysis should be upgraded

The role of the livestock sector in climate resilience

Alejandro Acosta, Livestock Policy Officer, Animal Production and Health Division, FAO

Alejandro Acosta shared his view on public spending in the livestock sector and linkage to climate resilience. He gave an example of a project carried out by the Livestock Policy Lab (LPL) to assist countries to increase allocation of resources to control and prevent animal diseases.

The paper focused on livestock policies as well as methodologies for evaluating the contribution of livestock to rural livelihoods. The research highlighted the lack of empirical evidence in the livestock sector to support policy makers choices. Previous studies on the contribution of livestock to the rural economy had employed an aggregated index as proxy of livestock assets which underestimated the contribution of the livestock portfolio to consumption, income, and resilience.

It had been suggested that households keeping livestock were more resilient to crises. However, the evidence had been generally mixed and mostly based on case studies. Some studies had confirmed the role of livestock in contributing to the resilience of households while others had indicated the contribution was rather small or insignificant.

In order to find out how significant livestock assets were within the resilience strategy of rural households, a database consisting of more than 2000 observations from 90 countries had been created. The analysis examined the impact of livestock assets on two key variables: income and food consumption. The study measured how that outcome had been affected by exogenous shocks such as a severe drought and how the use one of the response mechanisms (livestock, savings, reduce food consumption, sell grains, borrow from friends purchase on credit) could mitigate that shock.

The analysis had been guided by three questions. What was the effect of a climate shock on a rural household's food consumption and income level? Were households owning livestock assets more resilient to climate shocks? Had the desegregation of the livestock portfolio had statistically significant effects?

Research results had highlighted the negative impact of extreme weather events on income and food consumption. A severe drought could have a devastating effect of reducing income by nearly 20 per cent and 8 the level of food consumption in a rural household by 8 per cent. In addition, the results had also highlighted the mitigation potential associated with different types of livestock. Cattle was not one of the best alternatives to cope with the shock as suggested by previous studies, at least in the short and medium term. Sheep, goats and chicken could fully compensate the shock.

These results implied several policy recommendations. Strengthening households' resilience to climate change would be fundamental to eradicate poverty and end hunger. A diversified livestock portfolio could strengthen the resilience capacity of households to severe climate shocks. However, the lack of robust empirical evidence might be leading to a gap in the design of policy instruments and allocation of public spending.

Discussants

Frédéric Seppey, Assistant Deputy Minister from Agriculture and Agri-Food Canada:

Mr Seppey emphasised that public spending in agriculture should aim for objectives, including the elimination of poverty. Providing good a regulatory framework was also

important, such as promoting the use of animal health standards for animal health. Small producers in developing countries should have access to essential veterinary products to ensure animal health. Good agricultural practices and good economic policies can work together to create positive outcomes.

Given the growing complexity of the food system, some attention should be given to value addition in agriculture. Policies that affect the food processing industry can also have impact on climate change.

In the context of the WTO, these discussions raised several questions relating to the role of international trade in solving some of these complex problems. Could regionalization of trade offer solutions? In addition, what were the policies and practices that have had the least effects on agriculture production, and therefore less distorting effects on trade?

Simon Smalley, Minister-Counsellor, Australian High Commission

Mr Smalley noted that the presentations had coherent messages with respect to policy tools. One key question related to how national institutions could promote policy coherence. Developing economies should focus on creating the enabling environment using policies such as support for research and development and infrastructural services. Investment in these types of policies could divert governments away from production and trade distorting policies.

The categorization of country contexts highlighted that policies for developing countries should be based on comparative advantages. Diverse policy approaches existed among the industrialized economies. The discussion raised questions regarding policy options for countries that have recently transitioned into industrialized agriculture, including large agricultural exporters.

Y. İlker Salar, Head of Department, Ministry of Agriculture and Forestry, Turkey

Policy priorities included increasing production, increasing exports, and decreasing imports. On the spending side, more investment in human resources and institutions was needed. This was challenging for developing countries. Turkey invested a lot in information technology and artificial intelligence, yet still needed to address hunger and poverty.

Discussion

Concerning the choice of factors to determine the different stages of agriculture transformation, Carin Smaller noted that several factors had been examined in the beginning of the project but only undernourishment and employment in agriculture sector had been chosen due to data availability. In order for the study to cover as many countries as possible and a period as long as possible the number of indicators needed to be reduced and the two factors selected could generate sufficiently robust results.

Carin Smaller noted that climate change and extreme events would make countries more dependent on trade in the future. Recent regional integration efforts encouraged trade in the regions where trade had not been strong in the past. In her view, the key question in agriculture was how trade could play a positive role in achieving equality by eliminating the concentration of power in the trade system and how countries in less developed stages could transform into more industrialized economies.

Thierry Ngoga responded to the question on what could be done to change Africa's agriculture budget situation. AGRA, as a government counterpart, faced problems regarding how it could support governments in their efforts to change. He noted the

importance of aligning with governments' priorities rather than focusing on promoting the agency's own agenda. He also noted the importance of integration as agriculture-related objectives were rarely embedded in other development objectives. He also stressed that raising awareness was important, from top leaders in the government to small farmers. He noted that AGRA had successfully bridged the gap between private sectors and government. The third problem identified by Mr. Nogoga was the short-term engagement of investment partners. He considered that it would be hard to achieve agriculture transformation within 2-3 years during which time the support was provided.

Regarding how to make better agriculture policies, Y. İlker Salar underlined that lack of data had prevented many government, including Turkey, from adopting better policies. Carin Smaller noted that historically when countries had reversed the price policies penalizing the agriculture sector, development outcomes had improved. Krijn Poppe and Thierry Ngoga stressed the importance of better targeting. Mr. Poppe noted that policies that aimed at innovation and environment objectives could yield better results.

SESSION 4 - INNOVATIONS TO ADDRESSING THE CHALLENGES FACED BY SMALLHOLDER PRODUCERS

Moderator

Lee Ann Jackson, Agriculture and Commodities Division, WTO

Panellists

- **Mark Rosegrant**, Consultative Group for International Agricultural Research
- **Sunita Daniel**, Export St. Lucia
- **Tulio Garcia**, Cooperativa 4 Pinos, Guatemala

Discussant

- **Tjitske Bolt**, Dutch Dairy Association

Agricultural development is a powerful tool to end extreme poverty and boost shared prosperity. Growth in the agriculture sector can be more effective in raising incomes among the poorest compared to other sectors. At the same time, small holder producers face specific challenges in connecting to global markets to take advantage of consumer demand for sustainably produced agri-food products. This session examined innovations that offer new opportunities for smallholders. It also highlighted new approaches for partnerships between the public and private sector to support sustainable agriculture development.

Agricultural technologies for global food security

Mark W. Rosegrant, Consultative Group for International Agricultural Research

Dr Rosegrant noted that new technologies had evolved impressively and their application to agricultural production could give an important advantage to high- and middle-income countries. The key challenge was to understand whether and how the appropriate policies could create enabling conditions for low-income countries to leap-frog and reap the benefits arising from the application of such innovations.

New technologies, particularly for smallholders, could have disruptive effects, as they were often labor-saving. The possible establishment of economies of scale could lead to consolidation of land ownership and fundamental changes in contract farming. Therefore, policies to assess the net effects of the application of new technologies to the agricultural sector had to be analyzed and tested carefully.

IFPRI used a Decision Support System for Agrotechnology Transfer (DSSAT) biophysical model, linked with an IMPACT global partial equilibrium agriculture sector model to assess the impacts of agricultural technologies on farm productivity, prices, hunger, and trade flows.⁴ Combining the two types of models allowed simulation of how disaggregated changes in agricultural productivity could affect global and regional production, global food prices, and trade flows, as well as calorie availability and malnutrition.

Key results of the modelling framework included relative changes in yield in different scenarios. Under the hotter and wetter climate scenario, the largest ex-ante yield impacts

⁴ For more information see: <http://www.ifpri.org/publication/food-security-world-natural-resource-scarcity-role-agricultural-technologies>.

were achieved with heat tolerance for maize, followed by no-till. Heat-tolerant varieties of maize showed particularly high ex-ante impacts as they counteracted the shortening of the crop duration under climate change, which otherwise would adversely affect the grain filling of maize. The no-till simulations assumed long-term build-up of soil quality through continuous no-till over 40 years without interruption. No-till showed strong impacts, as drought was a major constraint for maize in key planting areas of the world and maize also heavily depended on nutrient inputs. No-till was therefore an ideal technology to improve outcomes in both areas. Moreover, maize was better able to respond to the technology when irrigated than when rainfed, because the irrigated crop did not experience water stress.

The model could be used to examine resource use efficiency, including impacts on site-specific water use for maize and wheat, as well as price effects. The baseline scenario including climate change would lead to a 20 to 30 per cent increase in prices. All simulations that included technology adoption showed a decline in prices compared to that baseline. Under both climate change scenarios, no-till and heat-tolerant varieties showed the strongest price-reduction effects for maize and wheat, compared to baseline prices in 2050. NUE varieties and PA had the strongest potential to reduce prices for rice. Moreover, among the combined technologies, heat-tolerant varieties grown under no-till and PA with no-till appeared to achieve reductions in prices of between 10 and 20 per cent for maize and wheat compared to the baseline.

Higher productivity in these crops led to improvements in food security as well as changes in harvested areas. Overall, NUE and no-till appeared to be the technologies with the strongest reductions in the total population at risk of hunger across developing countries. In terms of per cent change in harvested area and distribution of productive units, technology-induced improvements in yields and production could also result in increased land use intensity and thus less need to further expand harvested areas by 2050. According to the simulation, the technologies with highest yield impacts had also led to the largest increase in supply and thus caused the largest savings in arable area expansion globally. Results showed modest changes in trade balances after the application of the technologies under examination, with increases in net exports only materializing for rice.

Dr Rosegrant noted that developing countries face constraints in reaping the potential benefits of the technologies and innovations. Weather conditions, infrastructure, high input costs, and risk aversion (with farmers being more exposed to risks) were primary hindering factors. Social issues including gender bias and women's limited access to assets and the presence of pest pathogens and climate change also limited the ability of developing countries to enhance their agricultural practices.

The study showed that the policy landscape had played a key role in the ability of developing countries to benefit from innovations. For example, remote sensing and big data also had value in agricultural technology support; monitoring water availability for real time management of water; all these innovations could have transformative effects in developing countries with relevant payoffs. However, smallholders still faced prohibitive costs to implement these technologies. Analytical tools could be developed to identify gaps and detect potential for which specific technologies or policies would have a transformative effect.

Dr Rosegrant highlighted some policy conclusions from IFPRI research. Enabling conditions included strengthening land and water rights so that smallholders would be equipped to make better decisions. Since general subsidies, for instance input subsidies on fertilizers and water, could encourage inefficient use of resources, subsidies for new technology adoption needed to be sharply targeted. Non-distortive income payments could also be introduced as an alternative to more distortive subsidies. Rural infrastructure investments to improve access to markets, risk insurance, credit, inputs (roads, mobile phone towers)

needed to be established. Finally, he noted, regulatory reforms could also play a role by reducing hurdles to adopt new technologies.

Innovations to address the challenges faced by smallholder producers

Sunita Daniel, Export St. Lucia

Ms Daniel shared information several factors constraining the development of the agricultural sector in St Lucia. Farmers had limited access to risk management tools. The regional markets in the Caribbean were compartmentalized due to transportation limitations. Preferential market access rights for St Lucia were still not being exploited in key export markets. Border measures had further worsened the ability of local exporters to access target export markets.

Addressing these challenges required innovative private-public sector interactions. She highlighted a successful collaboration between a large supermarket chain in the Caribbean with the Ministry of Agriculture to set up a database to connect farmers to markets. This database listed certified farmers, data on production and exports, and other key data of vital importance for the management of the agricultural sector and connecting processors with producers. Supermarket chains had established a system of loans based on the information in the database, with a zero-default reported to date on those loans.

Tourism was another important economic sector in St Lucia which has strong connections to the agricultural sector. A virtual agricultural clearing house platform had been created using mobile phones to connect hoteliers with farmers, thus facilitating a domestic market in which farmers directly supplied produce to hotels. International cooperation agencies reinforced the connections between farmers and the tourism sector.

Export St Lucia was responsible for all exports from the country and made extensive use of ITC tools such as Trade Map and Market Access Map. This tool allowed the agency to access key statistics and analyze access barriers in target markets, including non-tariff barriers and to mobilize this information to assist farmers in connecting to markets.

Innovations and challenges for small producers in Guatemala

Tulio Garcia, *Cooperativa 4 Pinos*, Guatemala

Mr Garcia provided an overview of the agriculture sector in Guatemala. Agriculture accounted for 14 per cent of the GDP of the country, with 32 per cent of active population in the country (75 per cent in rural areas) employed by the sector.. The country suffered from widespread malnutrition and 76.1 per cent of the rural population lived under the poverty line.

Family and smallholder farming played the main role in the organization of the agricultural sector in Guatemala, with 70 per cent of food products reaching final consumers produced through family farming. Guatemalan exports had evolved from a model based on products such as coffee, bananas and meat, to a more diversified model in which exported products included less traditional products, such as horticultural products, fruits and flowers.

Small-scale producers in Guatemala faced special challenges. First, the condition of rural roads was problematic. Secondly, the availability of land in Guatemala constrained farm size. Irrigation was important, but only a small portion of the land was irrigated. Access to foreign markets and access to credit also hindered the expansion of the sector and climate change had severe effects on the country.

Mr Garcia described the Cooperativa 4 Pinos (started in 1979) and the ways in which this cooperative sought to address these challenges.⁵ The Cooperative had been set up to increase capacity building among producers and improve their ability to organize. After 40 years of operation, the cooperative had achieved key objectives. It had organized farmers and diversified production, including for important export markets overseas. Investments in productive and safe infrastructure had also helped improve the resilience of the agricultural sector to external shocks.

The Cooperative had made important advances in terms of inclusiveness and enhanced welfare of rural people. Women were included in all productive and social aspects of the organization of the work. Members of the cooperative benefited from medical insurance and price discounts. Education was also supported by the Cooperative. By participating in IT and computer training programs and English programs, cooperative members had been improving their livelihoods.

While the public authorities had not been providing direct support to the agricultural sector, Guatemala was a very large producer of some products, such as French beans and baby carrots, and production and supply chains had been transformed through the cooperative model. All programs were market driven and market established, in connection with hotels, supermarkets and restaurant chains.

The Cooperative sought to achieve a vertically integrated model, in order to export value added products. Mr Garcia also stressed the value of effective cooperation with the private sector as a replacement for public subsidies.

Discussant

Mrs Tjitske (Regina) Bolt, Dutch Dairy Association.

Ms Bolt highlighted the connection between the dairy sector and the SDGs. She recalled that former UN SG Ban Ki-Moon had made a presentation on the dairy sector and the SDGs highlighting the value of the dairy sector to feed an increasing world population. He had also stressed the importance of milk as a nutrient to human beings, while acknowledging the impact milk production had on the environment.

She noted that new policies needed to be consistent with the various development goals. The Netherlands provided an example of how innovations and policy consistency were key to making progress in this respect. The Dutch dairy industry was based on economic considerations and sustainability. The country had a strong cooperative approach, with highly specialized factories. More than 55 per cent of milk collected was used as input in the production of cheese. A strong market orientation coupled with a co-operation between the private sector and knowledge institutions had been factors of success. Quality and safety assurance systems in the country went beyond regulatory requirements to ensure that products could be exported.

Discussion

The speakers noted that data was key for farmers to connect to markets and new export opportunities. Data on climate was particularly important and was very difficult to obtain in a reliable format. Market trend data was also essential for farmers to decide which products to promote. The IT revolution had had an impact in terms of market prices, but the sector was still lagging behind in terms of getting information to the farmers in remote areas in Africa and South East Asia.

⁵ Video: "cooperative mujeres 4 pinos" <https://www.youtube.com/watch?v=nzhiV9pfz9o>

Regarding the importance of keeping up to date with the changing developments in SPS regulations in export markets, Mr Tulio noted that the cooperative also included experts who could inform producers, including on SPS regulations and requirements including micro biological requirements, and MRLs. The cooperative had created labs to check chemical residues and ensure access to foreign markets. However, testing in some cases was not done locally due to the cost of establishing local labs.

In response to a question concerning the key success factors of the Cooperative, Mr Tulio noted that the creation of the cooperative had been possible due to initial support from Switzerland. After a natural disaster in Guatemala Switzerland had created a 2 million dollar assistance fund, with 1 million going to housing, and 1 million invested to create further revenue streams. With the assistance from this grant the cooperative was created in 1985. The cooperative had since grown 15 per cent per year creating jobs and addressing malnutrition and illiteracy in the local population.

The speakers also commented on the role of government support targeting small producers. In the case of the 4 Pinos cooperative, the government had provided minimal support. The cooperative had established systems to determine prices when contracting directly with buyers. In the case of climate-related damages and losses, the cooperative refinanced producers out of its own resources. In St Lucia, public support for cooperatives came through the establishment of packaging facilities and infrastructure related, for example, to agriculture extension services. Governments also provided support for farmers to obtain certification and labeling through co-financing of packaging and certification compliance efforts of cooperatives and smallholders.