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Our panel on food security began with a video message from Jose Graziano da Silva, Director General of the FAO, reminding us of the serious challenges that remain in eliminating hunger and assuring food security for all. He emphasized the importance of coherent national and regional strategies, and mechanisms of regional coordination such as the CAADP in Africa that is proving a vital instrument for effective joint action among governments and international partners. In that regard he stressed more generally the importance of including actively all partners – governments, the private sector, NGOs, and the international community – in finding sustainable solutions to defeating hunger and assuring food security, particularly for the poorest and most vulnerable.

Christoper Delgado then painted a dramatic picture for us of the global challenge of food security. There are still over 800 million chronically hungry people in the world, and over 165 million children are stunted by early malnutrition. $\frac{3}{4}$ of these hungry are in rural areas. Most depend on farming and natural resources for their livelihoods, yet the natural capital on which they depend is eroding or insecure. At the same time, growing world population and changing diets will require a 60-70% increase in food production in coming decades. This will depend primarily on agricultural intensification, since the net amount of arable land available will not dramatically increase, as some will enter into use while others become unsuited for agriculture.

Meanwhile, a number of factors will increase price pressures and price volatility for the most demanded global agricultural commodities such as grains. And the countries that are most food-insecure will be most vulnerable to this increased volatility, which is likely to be a sustained, long-term phenomenon.

He also reminded us that the long secular decline in grain prices since the 1980s until fairly recently might have been bad news for farmers and good for grain-importing countries. But it led to policy complacency; and poor countries were blindsided by price spikes in 2008. The negative impacts of price spikes were made worse by export restrictions; when large parts of the world isolate themselves, everyone else has to bear the burden of the supply-demand maladjustment. This is a major issue of global governance.

There is some cause for optimism in that recent increased attention to agriculture and food security is leading to increased investment and improved productivity. We can expect more than half of increased productivity in coming decades to come from developing countries.

However, the large and worrying uncertainty that hangs over this picture is the impact of climate change on agriculture. We have good reason to expect that the impact will be negative, particularly in tropical areas where the greatest potential for yield increase could otherwise be expected.

Climate Change of 2 degrees Celsius could send World backwards with reductions in food per capita of the order of 10-20% perhaps as soon as 2050. Meanwhile flooding and salt water incursion already affects 15 million hectares of rice fields in South and East Asia.

To compound matters, agriculture is itself a major contributor to greenhouse gases, so we need to find ways to intensify agriculture while mitigating its negative climate effects. This can be done, particularly through agroforestry, and integrated crop, tree, land and water management. But this kind of complex, intensively managed agriculture requires a level of technical ability and support that few poor farmers have.

So we need a climate smart agriculture that improves crop yields and livestock management to increase production, increases climate resilience of farming systems, reduces carbon emissions and increases soil carbon storage.

All of this will require smart global partnerships, innovation, investment, a strong role for the private sector, and smart government policy.

Marcos JANK then began by reminding us of the importance, and the difficulty, of agricultural trade liberalization as a key element in the solution. Having just come from Bali, he expressed disappointment in the progress there and concern that the tendency to favor regional trade agreements such as TPP will not really create an adequate basis for an effective global agricultural trade system.

He then reminded us of the key factors that drove Brazil's remarkable success in increasing its agricultural productivity and export competitiveness in agriculture in the past few decades. These included the more effective use of ample natural resources; increased investment; deregulation; and economies of scale (through the increase in average plot size of plot & migration of small farmers to new agricultural areas, thus extending the frontier of Brazilian agriculture).

There was a huge jump in land productivity, with a key role of EMBRAPA in adapting crop varieties to Brazil's diverse tropical agro-ecological zones. Innovation in farming techniques was also key, especially new forms of crop rotation and the expansion of double cropping in areas with long enough seasons (for example, corn as a 2nd crop after soybeans)

Of course, all this increased productivity would not have had the desired effect on food supply and export competitiveness without strong efforts to increase farmers' linkages to markets, which has been another key priority. And this kind of productivity increase will not be sustainable without a more positive attitude toward GMO crops, which can dramatically increase yields.

He pointed out that there are great opportunities for cooperation between Brazil and Africa in agricultural development, particularly in adapting Brazil's substantial experience with agricultural technology and productivity enhancement to African conditions.

His Excellency Mr. Mahama Zougrana, Minister of Agriculture of Burkina Faso, then painted a detailed picture of the challenges of food security and agricultural development in his country, and how the government and all stakeholders are addressing these challenges.

86% of the population of Burkina Faso is involved in agriculture, and the vast majority of them are poor smallholders. There is much work to be done to improve yields, modernize agricultural techniques, strengthen market linkages, and reduce price and supply volatility. Investment, particularly private investment, in the agricultural sector needs to be increased, although the government has been increasing its own investment in the sector as well.

Improving agricultural performance also means improving rural livelihoods, and empowering women, who are the majority of farmers. There is also the challenge of attracting the next generation to agriculture. This also means greater efforts to secure agricultural land tenure.

Smart measures need to be taken to stabilize food supply, including development of food stocks, though this must be done in a way that is flexible and not market-distorting. Food producing areas need to be better linked to markets and to urban areas, and farmers, traders and other agricultural stakeholders need more accurate and timely market information.

Food security and agricultural development are key priorities for the government of Burkina Faso, but they cannot do it alone. A coordinated approach that involved government, the private sector, NGOs, the international community and other key stakeholders is the only way to answer this great challenge effectively and sustainably.

Jane Karuku reminded us that the majority of smallholder farms in Africa are women, and they are almost all poor. They work in a range of African countries to organize these farmers into groups and help them become more productive, sustainable and profitable. AGRA has developed an integrated set of strategies and programs to meet the needs of these poor smallholders. These include better access to affordable, appropriate inputs; information and knowledge on proper farming and harvesting techniques; access to credit, and market linkages. AGRA also works intensively on soil health issues, post harvest loss reduction, and other efforts both to increase smallholders productivity and their *incomes*.

Policy and advocacy work are also a crucial part of their efforts, because African governments have an important role to play in developing African agriculture, and they have not uniformly lived up to the pledges they have made in recent years, particularly the pledge to devote 10% of the government budget to agricultural development. Agronomy and extension services badly need to be rebuilt after long disinvestment, and the private sector can help in this regard.

She pointed out that more investment is starting to flow into African agriculture. For example, well-designed “outgrower” models where smallholders contract to grow crops for larger agribusiness firms are becoming more common and often having a positive effect.

She mentioned that 2014 has been designated the “Year of African Agriculture”, and expressed the hope that this visibility will lead to more concerted and coordinated efforts by all stakeholders to help African smallholder farmers not only lift up their own families, but in the process lift up African economies and contribute to global food security.

Brent Habig told us about the work that TechnoServe is doing in over 30 countries to build competitive farm businesses and industries. Although they are an NGO, they take a pronounced business perspective, with a goal of promoting sustainable businesses that expand food production, reduce food security and create broader economic growth in developing countries.

At the same time, they balance this commercial emphasis with a concern for inclusiveness, focusing on ways to link poor smallholder farmers to these new opportunities. They focus on locally appropriate solutions and see their role as a catalyst of positive change and innovation.

Part of their approach is to help farmers develop mixed strategies that combine the security of food crops with the income of cash crops. For example, growing and selling cocoa can provide a cash injection into smallholder households otherwise focused on food crops, thus smoothing out income and providing a cushion between harvests of food crops. This also points to the importance of developing credit tools for smallholders, but with mechanisms to strengthen repayment rates

Discussion

There was a lively discussion on a broad range of issues, with several key points getting the most attention:

1. Market distortions: the discussion came back several times to the various influences that create price volatility and market distortions in agricultural commodities. Moving beyond the simplistic view that volatility is primarily caused by speculation, the group reviewed the combination of long-term structural drivers (such as underinvestment, growing demand and climate change) and short-term triggers (including supply interruptions, government policies and extreme weather) that inject greater volatility into global commodity markets.

2. The importance of smart policy, public investment and political will. Governments in Africa have been pledging for years to re-energize the agricultural sector, but results have been uneven and many have not met their commitments.

3. Climate change and the need for resiliency: there was broad consensus that climate change will have a notable impact on agriculture, particularly in tropical areas, and that governments and others have to be proactive now to build resiliency into agriculture AND global food systems to mitigate these effects.