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Meeting the rising global demand for food

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The Global Environment

Meeting the Rising Global Demand for Food

The Challenges

It is becoming increasingly difficult to satisfy the rising global demand for food in a sustainable manner. A number of reasons contribute to the uncertainty in our ability to meet the food demand of an increasing world population: The average living standard of the population is rising, land use is shifting from agriculture to urban and industrial uses, the production of nonfood crops for bio-fuels is on the rise, investments in increasing agricultural productivity are growing slowly, water and arable land are increasingly becoming scarce and global warming is making it more difficult to produce food in various poor countries.



Moreover, the food price crisis of 2008 added fuel to the fire and put food security on top of the policy agenda.

At the heart of the food security agenda lays water scarcity as irrigated agriculture accounts for 50% of the total crop production in the World. Many countries, especially in North-Africa, Near East and East Asia have already reached critical levels of water scarcity, which is expected to get worse with the forces mentioned above. There are various ways of tackling the entangled problems of water scarcity and food security:

1. How can existing water management policies (e.g., subsidies for water in many countries) be modified to give incentives for conservation?
2. What is the role of “international land deals” in addressing the water and food security problems? Do we need an international institution to make sure these deals benefit both the investing and recipient countries?

Value produced from a unit of water for selected commodities				
Product	Water productivity			
	Kilograms per cubic metre	Dollars per cubic metre	Protein grams per cubic metre	Kilocalories per cubic metre
Cereal				
Wheat (\$0.2 per kilogram)	0.2-1.2	0.04-0.24	50-150	660-4,000
Rice (\$0.31 per kilogram)	0.15-1.6	0.05-0.18	12-50	500-2,000
Maize (\$0.11 per kilogram)	0.30-2.00	0.03-0.22	30-200	1,000-7,000
Legumes				
Lentils (\$0.3 per kilogram)	0.3-1.0	0.09-0.30	90-150	1,060-3,500
Fava beans (\$0.3 per kilogram)	0.3-0.8	0.09-0.24	100-150	1,260-3,360
Groundnut (\$0.8 per kilogram)	0.1-0.4	0.08-0.32	30-120	800-3,200
Vegetables				
Potatoes (\$0.1 per kilogram)	3-7	0.3-0.7	50-120	3,000-7,000
Tomatoes (\$0.15 per kilogram)	5-20	0.75-3.0	50-200	1,000-4,000
Onions (\$0.1 per kilogram)	3-10	0.3-1.0	20-67	1,200-4,000
Fruits				
Apples (\$0.8 per kilogram)	1.0-5.0	0.8-4.0	Negligible	520-2,600
Olives (\$1.0 per kilogram)	1.0-3.0	1.0-3.0	10-30	1,150-3,450
Dates (\$2.0 per kilogram)	0.4-0.8	0.8-1.6	8-16	1,120-2,240
Others				
Beef (\$3.0 per kilogram)	0.03-0.1	0.09-0.3	10-30	60-210
Fish (aquaculture ^a)	0.05-1.0	0.07-1.35	17-340	85-1,750

a. Includes extensive systems without additional nutritional inputs to superintensive systems.
Source: Based on Comprehensive Assessment of Water Management in Agriculture 2007.



3. How can businesses contribute to better management of water resources, both through their involvement in new land deals and industrial production?
4. How can the global trade system be made more reliable and predictable in order to provide a dependable market for food?
5. How can international organizations, such as the CGIAR and the FAO, work with local governments to create ways to increase agricultural productivity in water stressed areas?
6. What is the role of GM technology in making dryland and saline agriculture technologies feasible?
7. Do large scale investments such as desalinization projects provide a solution to water scarcity, or do they divert attention from improving the existing institutional and political structures to better manage our existing water resources?

Proposed Solutions

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1. International land deals have the potential to contribute to agricultural productivity by providing the investment urgently needed in the agricultural sector in developing countries. They can also facilitate knowledge and technology transfer to local people if implemented carefully. Nevertheless, there is a need for increased transparency to ensure that local communities benefit from such investments and that not all gains are transferred to the investing country or company. An international body may be needed to define the economic, social and environmental conditions that need to be satisfied to make sure that such investments are beneficial to all and sustainable.
2. Businesses (both industrial and agricultural) should try to minimize their water footprint on a life cycle basis by employing the latest technologies available. Incentives may be created by governments to ensure that enough R&D budget is devoted to improving the water use efficiency by businesses.
3. World trade in food should be open, fair and free even under crisis with the contribution of all countries to the WTO Doha Round. Special clauses may be added to deal with trade restrictions under crises and conflict resolutions that stem from these. A virtual food reserve and an intervention mechanism should be created to help avoid price spikes in the future.
4. The development and application of new techniques to deal with the increasing water scarcity in some regions requires higher investments in agricultural R&D. In particular, the CGIAR centers and the national agricultural research centers should collaborate to identify solutions that are suitable to local conditions.
5. Genetically modified crop varieties (esp. wheat, corn and soy) that are tolerant to drought and salt are already being developed by businesses and governments alike. These initiatives should be coordinated and tested well before being implemented. Their potential benefits and costs should be made public to ensure that their development does not stall due to unfounded public fear.



6. Climate change will aggravate the problem of irrigated agricultural production. Especially in North-Africa, Near East and East Asia water scarcity needs to be addressed especially for small scale farmers. Investment and political support should foster production techniques that preserve natural resources that are the basis for agricultural production. Special attention needs to be paid to preserve the fertility and the water retention capability of the soils, and an efficient use of available water resources. This is essentially connected with the preservation of ecological resources that enhance the resilience of agriculture and aquaculture systems. Support should therefore include the development and dissemination of such sustainable techniques with financial incentives from the government and the international community if need be.
7. The international community should develop criteria to compensate those (farmers, governments or businesses) who contribute to the sustainable production of food while decreasing the pressures on water and land. The preservation of these resources is a global public good that deserves a global policy framework similar to the REDD of the Kyoto Protocol.

Nasir Ali Shah Bukhari

Chairman, KASB Group

Idea: Creation of global fund for food security

Background

Malthus's grim prediction that the world will run out of food has long been delayed by yield improvements and productivity gains. However, the marginal increase in food productivity from the application of technology is now in the decline. Along with this declining marginal increase in supply, there are considerable demand pressures, as the population in emerging markets change their dietary requirements due to moving up the nutritional chain. These two factors, pose a real and significant threat to food security, especially for the more marginalized sections of the population. Food inflation is further being exacerbated by the investments from speculative funds and the use of some edible crops like corn, maize and sugar, for the production of fuel. The increasing trend of global land grab for corporate farming will further limit the access of poor to food resources. As the prices of food items increase, millions of people, especially in Africa and Asia will find it unaffordable, hence creating a human disaster.

Cause of the problem

I believe that inequitable distribution of arable land, water, and basic mineral resources like Potash can further exacerbate the situation. China which has 20% of world's population, only has 7% of world's arable land. Similarly fertilizer like Potash which is necessary for the growth of crops, is controlled by two trading groups. Countries like Pakistan are expected to run out of arable land due to change in weather patterns. Countries and companies which control arable land, fertilizers and water, can control the rest of the world. This can even lead to wars for access to food resources. The current concerns in China about the takeover bid by BHP for Potash Corp is an example of this trend. Similarly, World Bank's report regarding Global farmland grab illustrates the key threats emanating from the global trends in the food market.

Idea

I propose the creation of a global food fund. Currently countries like US maintain their own food supply reserves which they use to control the prices of agriculture output. Food crops are even thrown in the sea in order to artificially support prices! A global fund or reserve should be created, in which every member country should contribute according to their excess output



(output in excess of domestic demand). This food stock reserve should be used to either control prices and/or directly provide food to regions where there is risk of famine. Giving cash to such regions is sometimes counterproductive, since it leads to further increase in the prices of essential commodities. A global fund for food security can be created at multinational level, similar to the IMF.

World Bank should encourage new construction of Dams and water reservoirs in developing countries. In recent past World Bank and other multilateral agencies stopped financing new dams projects in developing countries due to environmental concerns. However, it has proven detrimental for availability of water when it is needed. Recent floods in Pakistan have proven that due to insufficient water reservoirs floods have inundated many towns and brought huge human sufferings. Had Pakistan been provided financing in 90's at least 3–4 dams could have been built. World Bank is still reluctant to finance dam projects.

Shenggen Fan

Director General, International Food Policy Research Institute

Halving hunger and ensuring food for all through “business as unusual”

Business as usual will not be enough to halve hunger by 2015 and ensure food for all in the long run. What is needed is “business as unusual”—a smarter, more innovative, better focused, and cost-effective approach to reducing hunger. The elements of this new approach are as follows.

Invest in two core pillars: Agriculture and social protection

The first step in reducing poverty and hunger in developing countries is to invest in agriculture and rural development. Policymakers should also scale up investments in well-targeted safety net programs that focus on nutrition and health and increase production capacity.

Bring in new players

New actors in global development—the private sector, philanthropic organizations, and emerging economies—have important roles to play in reducing hunger and increasing food supplies. They should be fully integrated in the global food security agenda.

Adopt a country-led, bottom-up approach

To maximize impact of the global food security agenda and tap on external development assistance, countries need to develop effective, efficient, and sustainable policies that are well adapted to the local context. Reforms should also be local in nature, with poor people acting as a driving force.

Design policies using evidence and experiments

Policy experimentation is crucial for effective agricultural reforms. To succeed with this approach, policymakers need to allow for impartial monitoring of experiments and rapidly transform the lessons learned into large-scale reforms.

Walk the walk

Decision-makers at the global, regional, and national levels need to meet their commitments in a timely manner to effectively enhance food security. Strong institutions and governance, as well as monitoring and transparency are vital to support the fulfillment of pledges.



Some aspects of this “business as unusual” approach have already been successful in a few countries, but they should be scaled up and extended to new countries to have a real impact on the enhancement of agricultural productivity and the reduction of global hunger. Global and national actors, which have distinct roles to play, need to work together. A stronger system of mutual accountability between the two groups is needed to keep progress in cutting hunger on track.

Marco Ferroni

Executive Director and Board Member, Syngenta Foundation for Sustainable Agriculture

There is a lot of pessimism nowadays about the world’s future ability to feed itself. But if science and sensible policies prevail, strategic investments are made, and markets function properly, the rising global demand for food can be sustainably met.

The world has successfully risen to the challenge of meeting increasing food demands in the past. We can accomplish the feat again, even though the task is now complicated by the need to conserve natural resources and address climate change. There is vast potential to cut inefficiencies and waste in agriculture and to raise yields sustainably by growing more with less.

I focus on production and post-harvest issues in this note: growing and conserving enough food to meet global economic demand. I realize that food security is not solely determined by production and the availability of food, but also by access and a host of other factors that affect nutrition and food use. Access is a function of income and purchasing power; it is not directly linked to production except where production and income coincide in smallholder farming.

Economic demand evolves with population and income growth. The global population growth rate is slowing and is expected to stabilize around the replacement level by 2050. On the other hand, income growth is projected to accelerate. The effects of income growth on the demand for food are mitigated by Engel’s and shaped by Bennett’s law: the tendency, respectively, for the proportion of income spent on food and the starchy staple ratio in the diet to decline as income grows.

The demand for food in 2050 is estimated to be twice today’s level. Nobody knows what the exact figure will be, but it is clear that significantly more food will be needed. Not surprisingly, agriculture and related activities like food storage and processing are in the news. Agriculture must be intensified to stop the further destruction of forests for cropland and pastures, arrest the loss of biodiversity, and discontinue the mining and overuse of water and soils. Post-harvest technology and food processing must evolve to reduce losses, increase food safety, and improve supply chains from primary production through to retail.

Farmers must be given a chance to earn a reasonable living from their labors. Cheap food is great for consumers, but farmers’ income and their related ability to operate sustainably and invest in their land should not be forgotten. The fact that most of the food eaten in developing countries comes from small farms, and will continue to for some time, must be accepted and the policy implications understood. Yields on resource-poor small farms are unnecessarily low, particularly in Sub-Saharan Africa and South Asia, and unsustainable farming practices abound. The reason is not farm size per se but poverty and the absence of support.

In many instances, the difference between realized productivity and the best that can be achieved with current genetic material and available technologies and management is huge. These “yield gaps” imply the presence of unused productive capacity on existing agricultural land. Three things are needed to close the gaps: technology, services and access to markets. Small farmers often miss out on all three. To increase their productivity, farmers need improved, adapted high-yielding seeds with relevant traits such as pest and disease tolerance. They need agronomic knowledge and such boosters as fertilizer, credit, and risk transfer tools.



Farmers need to make better use of locally available resources in the context of improved cultural practices and put purchased inputs and services to work in line with their economic and managerial “absorption capacity.” That is what intensification is all about, but external inputs cannot be justified unless there is the strong possibility of making money from harvest sales. Hence, markets are essential along with roads and other infrastructure, including information highways and the tools to access them, to link farmers to markets. Arrangements such as the organization of farmers into cooperatives raise their ability to deal with buyers on more equal terms.

A problem that tends not to get the attention it deserves is the dearth of input and service delivery systems actually reaching small farmers. Public programs in agricultural R&D have been successful but are notoriously ineffective in most countries when it comes to actually delivering products such as improved varieties of seed all the way to the farmer. It is in the nature of the private sector to bring products to the market and deliver value, including to small farmers. But the private sector goes where there is a commercial incentive. Farmers too remote or too poor to purchase inputs are not helped, and the technologies they need may not get developed.

This is a public policy and societal challenge that cannot be solved by the public or the private sector alone. It requires public-private cooperation that, in addition to the farm population, must include nonprofits such as foundations, NGOs, farmer organizations and self-help groups. Cooperation offers the prospect of overcoming each sector’s limitations: the business sector’s inability to operate where there is no market; the non-profit sector’s instruments and interventions that tend to take the form of projects that reach relatively small numbers of farmers and operate only as long as there are funds; and the public sector’s limited ability to market research outputs.

“Taking it to the farmer,” therefore, is a challenge. **Business partnerships between private and public/nonprofit actors could offer effective routes to small farmers.** Technologies, services and inputs tend not to reach “pre-commercial” smallholder farmers or only after years of delay. Delivery paths to this category of producers are few and far between, and this failure has significantly reduced the impact of agricultural R&D. The private sector is often more results oriented than the public sector; years of investment in R&D are meaningless if you cannot sell your seed, crop protection technology, cell phones, fertilizer, machinery or tools. However, if operating on purely profit motives, as mentioned, companies may lack the incentive to go where purchasing power is low. Public-private partnerships to combine the research and product delivery strengths of the private sector with the public sector’s research strength on, for example, “orphan crops,” could build viable pathways for reaching smallholder farmers.

Successful public-private partnerships in agricultural R&D leverage relative assets, create synergies and offer wins all round, but they are not easy to craft. Trust may be an issue, as are considerations like how to evolve towards a unified strategy of sustainably enhanced agricultural productivity, share risks, and deliver effectively for the benefit of all involved. Open innovation and intellectual property commons, potentially involving royalty-free licensing for certain markets, hold promise. The Syngenta Foundation for Sustainable Agriculture has brokered a number of partnerships between public and for-profit entities that set the stage for developing and marketing smallholder-relevant traits that could not be produced by either the public or the private organization on their own. This is a field that deserves further attention.

The prospect of disseminating agricultural technology is enhanced if the ground is prepared on the demand side. Knowledge regarding agronomic options and market prospects, and risk management tools (in particular agricultural index insurance, as we shall see), are singled out for comment here as priorities to help prepare the ground. Knowledge is a binding constraint in all farm operations, and the purpose of agricultural extension is precisely to disseminate knowledge regarding improved farming and post-harvest practices. **Mobile applications in agriculture can boost the dissemination of knowledge.** Farming is a business with great



information and communication needs. “E-agriculture,” the delivery of agriculture-related information and services via information and communications technologies, offers potentially game-changing opportunities for timely communication of relevant information on a massive scale. Connectivity is not the constraint that it used to be; the issue now is content and applications in clusters that include (i) agricultural knowledge and decision support (“extension”), (ii) marketing-related applications (price discovery and trading opportunities), (iii) support services such as quality control, logistics, process management and financial services, and (iv) the use of mobile applications in data collection and the management of customer interfaces.

“M-agriculture” (a subset of “e-agriculture” that relies on mobile devices ranging from basic mobile phones to smart phones, PDAs and tablets) offers opportunities that are increasingly being exploited at different levels of complexity. Low-complexity systems push one-way information that is generated automatically, such as prices, weather forecasts and information stored in databases. Medium-complexity applications include location-based services (for example, localized and crop-specific disease warning and other decision support linked to local data such as weather and soil quality). High-complexity applications include individual feedback and advice, for example in response to remote diagnosis. “High complexity” might include the administration of business processes and individual transactions such as the registration of policies and account management, including user-generated content. The index insurance product discussed below is an example of a high-complexity mobile application. Mobile applications are evolving rapidly, their viability and sustainability being debated in increasingly sophisticated fashion from both a user and a supplier and value chain perspective.

Farmers need insurance to be able to invest. Farming is almost synonymous with managing risk—on the farm, where technology and farm management play key roles, and through community risk pooling. Weather risks define the lives of smallholder farmers. Agricultural micro-insurance can effectively reduce the harmful impact of severe weather as well as support increased investment in farm productivity. Insured farmers are more willing to purchase certified seeds and invest in fertilizer when they can be confident that they will be able to recover their investment in the event of crop failure. In years following drought, insured farmers are able to continue farming as before the drought, while their uninsured neighbors may feel the impact of the calamity for years. Agricultural micro-insurance can have a real impact on food security. Developing affordable and relevant agricultural micro-insurance that can be managed by the private sector is a priority.

The Syngenta Foundation is facilitating the development of an agricultural micro-insurance product based on a weather index. This offers a method to insure farms as small as one acre by replacing costly farm visits with measurements from local weather stations as the indicator of drought. The weather stations measure the rainfall and these measurements are compared to an agronomic model that specifies crop rainfall (or moisture) needs. If the needs are not met, all farmers insured under that station receive a payout, the size of which corresponds to the timing and severity of the drought. If the needs are met, none of the farmers are compensated.

The product enables farmers to insure their outlay on eligible purchased inputs such as seed, fertilizer and crop protection products. Partnerships with the private sector and paperless registration and administration based on an advanced mobile platform keep costs down and premiums affordable. The product is now offered commercially in Kenya and has been bought by some 12,000 farmers so far in 2010. It is a promising prototype that is being monitored closely as efforts to roll it out much more widely are scaled up.

Partnerships-based routes to farmers, mobile applications and index insurance are but three action domains that are relevant to the quest for meeting the rising global demand for food. They are singled out here as “solutions” in the tradition of the Global Economic Symposium as an action-minded community, to stimulate discussion. They are not sufficient in and of themselves but, together with the reduction of postharvest losses, can go a long way



towards addressing the “availability” dimension of the food security challenge by enabling farmers to invest and close yield gaps.

Solutions to reduce agricultural waste and post-harvest losses also must be implemented to ensure a safe and reliable supply of food. Losses from some crops in some countries may approach 50% and safety issues such as those deriving from mycotoxins, especially aflatoxins, cause serious health problems in many countries. Anger over wastage and spoilage of grain in storage facilities such as the “go-downs” of the public distribution system in India is frequently vented in the press. There is room for improvement with storage facilities, but note that a recent study of this issue in India found that this by itself will not bring down the price of food (Kaushik Basu, *The Economics of Food Grain Management in India*, September 2010. Available at <http://finmin.nic.in/WorkingPaper/Foodgrain.pdf>).

Storage solutions at the farm level or applied by communities and farmer organizations are important for food security and to time sales. Solutions such as low-cost metal silos to conserve grains and pulses have made a difference in many rural settings, and could be expanded through purposeful social marketing and commercial channels. Cooling technology and cold storage facilities are relevant for perishables including fruits, vegetables, milk and such crops as potatoes in the tropics. All of these are cash crops and thus important as income sources for farmers. Storage infrastructure and technology are significant both for preservation and as a price hedge because of the ability to schedule sales in accordance with seasonal movements of price.

If agriculture is given the priority it needs and deserves, and solutions of the kind suggested in this note come to pass together with other necessary support, there is no reason why the rising global demand for food cannot be met. But “farming first” must prevail lest the food doomsayers and pessimists turn out to be correct.

Seyfettin Gürsel

Director of the Economic and Social Studies Center, Bahçeşehir University

Sustaining an adequate food consumption level for those poorest segments of the society is an important responsibility of the State. Even though Turkey succeeded in ameliorating the living standards of the poor in the first half of the 2000’s, the strong increase in the food prices in 2007 presented a new challenge in the fight against poverty.

Between 2003 and 2006, high growth rates coupled with stable food prices, ensured a sizeable decrease in poverty and hence an increase in the consumption of the lowest quintile. In 2007, this pro-poor growth period ended with a sharp increase in food prices due to global droughts, increasing oil prices and the growing food demand in highly populated developing countries. Creating an inflationary pressure, the increase in food prices widened and deepened poverty.

To avoid dramatic consequences in the future, the State needs to monitor and control food prices as well as creating new food safety nets for the poor. We propose a policy that consists of three dimensions.

1. Poor Consumer Price Index

Price increases may have asymmetric inflationary effects on various segments of the society due to different consumption patterns of these groups. For example, food consumption constitutes a higher share in the consumption basket of lower income quintiles. In other words, food price shocks affect lower quintiles more.

Therefore, we propose a new price index for each country, namely “Poor Consumer Price Index” which is based on the consumption patterns of the poorest segments of the society.



This new index, as a standard part of the consumer price index, will help monitor the impact of increases in food prices on the poverty closely.

2. Voucher system as a part of a social safety net

Tax reductions provide another tool in compensating adverse affects of food price increases. A certain proportion of total food expenditures can be transferred to the budget through a special tax, and the income generated in this manner may be used to finance a food voucher system for the poor.

3. Structural reforms to reduce the high volatility in the non-processed food prices

Although droughts, increasing oil prices and the growing food demand in developing countries are mostly responsible for the volatility in food prices, inefficiencies in the markets may also lead to instability in food prices. These two sources of price volatility are different in nature and their eradication requires different policy tools.

a. High volatility related to production shocks

Technological improvements in agricultural production may help minimize output fluctuations.

b. High volatility due to the inefficiencies in food markets

Regulations in the market for non-processed foods will improve the efficiency of the market. Empowerment of the producers through the elimination of intermediaries (of low or zero value added) will have both direct and indirect effects on food prices.

H.E. Rodha P. Tumusiime

Commissioner for Rural Economy and Agriculture, African Union Commission

According to the World Food Programme, by 2009 Africa had about 212 million under-nourished people (an increase of about 44 million from 1990) while some 388 million lived on less that US\$1.25 a day in 2005 as compared to 295 million in 1990. Reports also indicate that everyday, more than 600 people go to sleep without food.

This state of affairs calls for doubling of efforts at global level to meet the rising demand for food. Following are some of the proposals in this regard.

1. Increasing agricultural production and productivity including through technology generation and dissemination, disease and pest control as well as applying fertilizers and other yield-enhancing inputs.

This proposed solution is important because, for example, average rice yield per hectare in Africa is about half the global average. The comparative figure for maize yield is even worse, about a quarter of the global average. Africa's agricultural production is organized in a traditional manner where very little or no inputs and improved methods of production are employed. For example, on average, fertilizer use is around 8 kg/ha compared to the 150 kg/ha global average.

2. Enhancing market access and value addition.

This proposed solution is crucial considering that the slow pace of rural infrastructure development and its low maintenance in Africa has hampered marketing and movement of agriculture products from one region to another within a country, let alone their negative effects on inter-regional activities. As a result, relative seasonal surpluses in one location run in parallel with severe shortages and even hunger in another location close by within one and the same country. The value of Africa's annual imports of agricultural produce is estimated to be between US\$28–33 billion annually, which by far exceeds the intra-African trade. Clearly,



there is a huge “home” market demand that could potentially revolutionize agricultural transformation and improve livelihoods. Further, Africa’s agricultural produce face a huge challenge in meeting minimum sanitary and phytosanitary requirements and standards in developed countries. Since little or no processing takes place to transform the products and add value, African agricultural produces do not fetch higher prices and losses are significant.

3. Putting in place appropriate policies and strategies, and strengthening institutional mechanisms.

This proposed solution is necessary because institutional deficiencies in the policy environment do undermine the performance of African agriculture and rural economy. Owing to limited institutional capacities for policy implementation, program implementation is often not consistent with policies and strategies, creating uncoordinated interventions that result in ineffective and inefficient use of resources. Historically, Africa never gave the agricultural sector the attention it deserves. In fact, until very recently, development policy was biased against the agricultural sector. The focus was on other sectors, and budgetary allocations to the agricultural sector were very low. Overseas Development Assistance (ODA) to agriculture declined from US\$8 billion in the 1980s to US\$3.4 billion in 2004. This was compounded during the 1980s and 1990s by the introduction of Structural Adjustment Programs where public support to agriculture (e.g., input subsidies, support to public research and extension systems, etc.) was abandoned. The expectation was that the private sector would move into the areas where the public sector supposedly had been having a crowding-out effect. The fact was, however, that the private sector did not move in, and the vacuum created by the withdrawal of necessary public support led to a worsening performance of the agricultural sector. The few nascent institutions, such as agricultural research systems, extension services, inputs delivery mechanisms, etc., were dismantled.

4. Conserving environment and natural resources through sustainable land and water management, among others.

This proposed solution is critical given that at least 95% of Africa’s farming systems are dependent on rain-fed agriculture. The region’s agricultural production and livelihood processes are therefore directly dependent on the environment. Biodiversity in Africa is under constant pressure as a consequence of unsatisfactory regulations and their limited enforcement. Air quality has also emerged as a serious challenge. Moreover, the impact of climate change and desertification has been extremely severe in Africa. Severe droughts are now more frequent, often leading to widespread famines among rural populations, decimating tens of thousands of lives before emergency responses could reach them. Similarly, seasonal floods have led to severe devastations, impacting the lives and livelihoods of millions of people. Access to, and availability of, quality fresh water resources pose a major developmental challenge. Approximately 22% of arable land in Africa has been degraded, of which 66% is classified as moderately, severely, or extremely degraded. This severe soil degradation is causing annual productivity losses ranging from 7% of pasture land to 25% of cropland, and affecting about 485 million small producers or 65% of the entire African population. In addition, deforestation in Africa accounts for over half of the global deforestation in the past two decades, which is costing the continent an estimated US\$9.3 billion income loss annually. Land degradation and desertification have been slashing down the asset bases of rural people, dashing hopes for many and thus become one of the “push factors” for causing people to move away from the affected areas. Insufficient adaptation capacity to climate change remains a key challenge in Africa, further exacerbating its food insecurity.

5. Providing political and technical leadership.

The above solutions ranging from policies, research and technology, inputs and infrastructure to value addition and environment conservation, can not be put in place or implemented without strong political and technical leadership at all levels to push for implementation and monitoring for results and impact in terms of: increased food production; thereby reducing food



imports; and reducing dependence on food aid; reduced hunger; reduced malnutrition; and increased household incomes and wealth.

In the Comprehensive Africa Agriculture Development Programme (CAADP), the African Union emphasizes the principles of agriculture-led growth, science-based policy and strategy formulation and implementation focusing on results to the most vulnerable, hungry and poor people. CAADP emphasizes the need to appreciate evidence-based planning, comprehensive approach to agricultural development and country-led strategy formulation and implementation. Through the implementation of CAADP, we have also noted that success in agricultural development requires clear stewardship of policy and strategy and monitoring for results.