

A major reason why agricultural productivity is low is the poor state of Africa's soils. Africa's soils are the poorest in the world. The continued reliance on extensive agricultural practices means that fallow lengths have continued to decline with population growth. It has been estimated that Africa loses about \$ 4.5 billion of soil nutrients every year. This has been going on for the past 30 years. As a result the natural capital stock on which agriculture depends is being depleted rapidly. Fertilizer use in Africa is the lowest in the world, averaging 8 kilograms per hectare, compared to over 140 kilograms per hectare global average, and over 200 kilograms per ha in China. The average fertilizer use in Nigeria is still very low at around 10 kilograms per ha. It is important, however, to notice that due to the positive efforts of the Nigerian government on expanding fertilizer use the extent of nutrient depletion has reduced in Nigeria compared to other countries in Africa.

The average level of use of fertilizers in Africa has been projected to reduce in the near future due to the rapid increase in global fertilizer prices. For example, the price of DAP has risen from \$245 per ton in January, 2007 to \$1600 in May 2008. Efforts are needed to reduce fertilizer procurement costs in Africa. The Abuja Fertilizer Summit, held in 2006, agreed to the need to rapidly raise the average level of use of fertilizers from the current 8 kilograms per ha to an average of 50 kilograms per ha by 2015. The Nigerian Government made a pledge of \$10 million into the Africa Fertilizer Financing Facility that was established by the African Development Bank, in response to calls from the African heads of state. Regional procurement of fertilizers should be promoted, as well as greater local manufacturing of fertilizers in Africa, if Africa is to address its fertilizer crisis.

Majority of farmers in rural Africa have great difficulty accessing fertilizers because the rural input markets are poorly developed. Many have to walk or travel several kilometers just to get access to small quantities of seeds and fertilizers, sometimes as far as 25-30 kilometers in some countries. Paradoxically, one can find Coca Cola in every African village! AGRA has been working to train and transform many of these shop owners into what is called 'agrodealers'. With provision of technical and business skills these agrodealers quickly become retailers of farm inputs in rural areas. But the next challenge facing agrodealers is how to stock up their shops with seeds and fertilizers as they lack access to credit. Credit guarantees are used to link the agrodealers to seed and fertilizer companies, as well as to commercial banks. In Malawi where this experience was developed six years ago, agrodealers are moving millions of dollars of farm inputs into rural areas, directly to the door steps of farmers. Even more impressive: each dollar invested in a credit guarantee for the agrodealers leveraged sixteen dollars of supply of farm inputs into rural areas by seeds and fertilizer companies - a capita leveraging ratio of 16:1. The national default rate has been below 1% for the past five years - a remarkable feat. AGRA is currently working with several countries to train and certify thousands of agrodealers in an effort to make farm inputs easily available and affordable for farmers.

#### **African agriculture is still bleeding from the effects from structural adjustment in Africa**

Even as African countries are making efforts to make farm inputs more accessible and affordable for farmers, there is need for better policies to assure incentives for farmers to use improved seeds and fertilizers. The structural adjustment policies of the 1980s called for liberalization of markets, privatization of government parastatals, drastic reduction of the role of government in agriculture, cut in public expenditures and cancellation of subsidies for farmers. These policies have had disastrous consequences on African smallholder farmers. While the private sector has continued to play important roles, it has not been able to fill the gaps left by the withdrawal of the state. Today, millions of farmers are in deep poverty traps, unable to afford farm inputs, lack access to extension, while experiencing unstable prices for their farm products. Compared to farmers in the EU or the US, African farmers were abandoned. This "policies of abandonment" are at the heart of the food crisis that Africa is witnessing today. While other regions of the world continue to support their farmers, African countries - where poverty levels are much higher - are told they should let markets alone do it. The recently completed World Bank's review of its agricultural lending operations noted that these policies have been blamed for the low adoption of agricultural technologies and low productivity of agricultural productivity.

Africa needs to turn a new page. The structural adjustment policies were not developed in Africa. They were imposed from the so called "Washington Consensus" - the World Bank, International Monetary Fund and the US Treasury Department. But times has discredited this "Washington consensus". Because these policies pushed one-size-fits all model on African countries, they did not consider the stage of economic development, extent of poverty and the critical need for the public sector to engineer growth. While agriculture is back on the agenda, with the World Bank Development Report (2008), the question to ask is "under which policy context"? What is needed today for the Africa green revolution to be achieved is an "African consensus" on policies to rapidly trigger agricultural productivity growth, not a "Washington Consensus". There is need for evidence-based home-grown policies that take into consideration the diversity of African countries, stage of agricultural development, and extent of poverty and level of development of public goods needed to make markets work better for farmers. To achieve this, it is critical for African governments to invest in development of local policy analytical capacity and rebuild and strengthen policy centers of research. Also needed are policy advocacy platforms to ensure that policies that work for poor farmers are implemented.

#### **African Green Revolution: addressing medium and long term strategies for ending Africa's food crisis**

To address the fundamental cause of the food crisis in Africa, there is need to focus on medium and long term solutions to the continued poor performance of agriculture in Africa.

African leaders have called for an African green revolution in their quest to rapidly turn the continent from a food deficit to a food surplus in a short period of time. The then-Secretary General of the United Nations, Kofi Annan, established the Inter-Academy Council to look into ways of raising agricultural productivity in Africa using the best of science. Its report called for a green revolution, a "rainbow revolution" that takes into consideration the diversity of Africa's agro-ecologies and farming systems.

African governments have also declared their commitment to provide 10% of their national budgets to support agriculture. The Comprehensive African Agricultural Development Program of the New Partnership for Africa's Development (NEPAD) was endorsed by African heads of states. This is a significant development. It demonstrates that political leaders in Africa will take the needed actions to turn things around.

Africa is not alone. In response to CAADP and the political will for a green revolution, the Rockefeller Foundation and the Bill and Melinda Gates Foundation established the Alliance for a Green Revolution in Africa (AGRA). The Alliance for a Green Revolution in Africa is a broad-based partnership dedicated to helping millions lift themselves out of poverty and hunger by dramatically improving the productivity, food security, and livelihoods of small-scale farmers across Africa. Under the chairmanship of former United Nations Secretary-General Kofi Annan, the Alliance is working side-by-side with farmers to improve food production in ways that promote equity and protect the environment.

The approach is comprehensive—addressing key challenges across the agricultural value chain, ranging from the development of improved crop varieties that can cope with the harsh climates, soil health to improve soil fertility and boost the natural resource base for a sustainable agriculture, development and strengthening of local and regional markets for farmers, development of irrigation and locally adapted water management systems, and improving the extension and technology delivery systems for farmers.

An initial funding of \$300 million so far has been provided through AGRA to assist African countries in their quest for a green revolution.

AGRA is a platform for all partners working together for the green revolution in Africa. It will work with national governments and support their efforts. It strongly supports the Africa Union and NEPAD on the Comprehensive Agriculture Development Program, work with donors in the agriculture sector across Africa, while deploying its resources strategically and coordinating efforts with others to avoid duplication of efforts. AGRA has developed strategic partnerships with the Food and Agriculture Organization of the United Nations (FAO), World Food Program and the International Fund for Agricultural Development (IFAD) to focus joint efforts around the "bread basket areas" of Africa, where rapid agricultural productivity can be achieved. AGRA has also signed memorandum of understanding with the Millennium Challenge Corporation (MCC) together with whom we will focus on directing infrastructure investments towards these "bread basket areas". In partnership with the UK Government, through the DFID, AGRA has received an additional \$50 million towards the establishment of private sector-driven "African Enterprise Challenge Fund" which will provide matching funds for private companies to invest in agriculture activities that spur growth and reduce poverty.

#### **Political leadership and good governance to achieve the green revolution**

But AGRA cannot do this alone. There is need for strong political will to back the agenda for the African green revolution. Just like leaders in Asia took bold decisions to ensure that their countries achieved the green revolution, freeing their nations from hunger and penury, African leaders need to rise to the challenge and ensure that Africa achieves its green revolution.

Leadership is everything. The President of Malawi, President Bingu Mutharika, said that even though his country was poor, he would not be a President that begs for food. Poverty, after all, should not be a permanent endowment of Malawi. He took the bold steps needed and went against conventional views and advice of donors. He decided to implement a national seed and fertilizer subsidy program. With a budget of \$60 million, the government embarked on an ambitious effort to ensure that every poor farmer in Malawi had access to seeds and fertilizers. The result has been remarkable. The nation produced over 1.3 million metric tons of maize above its national food consumption requirements. It did more: it exported \$160 million worth of maize, and gave 10,000 metric tons as food aid to its neighboring counties (Lesotho and Botswana) which were experiencing droughts. Malawi is now being hailed as an example of how strong leadership and political will can help unleash a revolution for farmers. If Malawi can do it, every African country can.

#### **Transforming Nigerian Agriculture: Lessons for food security and wealth creation in the agricultural Sector**

Excellencies, Let me come home to Nigeria. Nigeria has so much potential in agriculture. The challenge is to unlock the potential and turn Nigerian agriculture into a highly productive, efficient and competitive agricultural sector. The global food crisis presents a challenge but also an opportunity. Realizing the opportunity requires that we look at agriculture with new lenses. There is a lot of locked-up wealth in Nigerian agriculture.

Let's take a look at cassava where Nigeria can become a global leader.

The Federal Government initiated a bold effort to ensure that Nigeria is able to capitalize on its high production of cassava and achieve a goal of \$5 billion annually from cassava exports. The Presidential Initiative on Cassava helped to spur increased interest in cassava production. But the goal has yet to be achieved in any significant way, and remains elusive.

I will like to highlight some of the reasons why this is the case.

First, the cassava sector remains largely subsistence, with several small farmers, largely uncoordinated. The system is still largely rudimentary with use of low-input technologies, and lacks mechanization. Second, the average yields of cassava crops are still very low, about 10 tons per ha, compared to over 40-50 tons per ha in Brazil, Columbia and Thailand. Third, the cost of raw materials (the tubers) continues to account for between 50-70% of the production costs for various products (ethanol, chips, pellets, flour, starch etc) which limit competitiveness. Fourth, the sector is totally disorganized. There is little coordination of production, processing and marketing. As a result, price for cassava falls when production rises. Due to low income elasticity of demand for cassava households do not eat more even when their incomes rise. As a result of inelastic demand, price of cassava is prone to being depressed due to gluts from supply response. This has been the biggest challenge of the Presidential Initiative on Cassava. Farmers produce in response to the incentives but they lack access to markets.

But Nigeria can turn itself from a sleeping cassava giant into an aggressive, productive, efficient and competitive produce and marketer of cassava and cassava-derived high value products. To achieve the drastic restructuring of the cassava sector is needed, as purely laissez-faire market systems will not lead to the needed outcome. As is the case in Asia, where governments of Thailand led the way in directing technology, infrastructure, investment and market development for cassava, Nigerian Government needs to lead the way.

First, there is need for greater investment in research to develop more high yielding varieties of cassava, especially those with high starch content. There should be establishment of cassava multiplication centers across the producing areas to improve access to the planting materials.

Second, it is necessary to invest in mechanization of cassava production, from planting, harvesting and processing. No only does this reduce the labor costs, it also raises productivity of labor in farm operations. The International Institute of Tropical Agriculture (IITA) and the National Root Crops Research Institute (NCRI) should be supported to help on the development and introduction of appropriate and cost effective technologies in this regard.

Third, in most of the South Asian producing countries, as well as in Latin America, cassava production and processing are well integrated. There is need to integrated farmers and processors to ensure that there is timely and sufficient production of raw materials to assure full utilization of cassava processing capacities.

But all of these cannot occur unless there is a concerted effort by the Federal Government in directing technology development, investments, market development, infrastructure provision, control of grades and standards, as well as trade promotion and export enhancement facilities.

### **How Nigeria can catalyze a dynamic and competitive cassava industry**

#### **1. Establish Cassava Processing and Trade Facilitation Zones**

It is recommended that the Federal and State Governments develop what I will call "Cassava Processing and Trade Facilitation Zones" (CP-TFZ) just the same way as the Export Processing Zones (EPZ). Because majority of the staple crops in Africa are non-tradable in their current forms, it is critical that efforts be directed towards processing, development of new products for which there exists high income elasticity of demand, and to reducing bulkiness, costs of transport and to enhance shelf-life, while expanding markets.

The International Food Policy Research Institute estimated that the value of staple food crops in Africa exceeds \$150 billion per year, compared to the gross value of the traditional export crops which stands at around \$8.5 billion per year, and non-traditional export crops (especially horticulture and fish) which stands at around \$7.8 billion per year. Estimates from IFPRI also show that expanding staple crop production sector has the highest impacts on income growth for African countries.

In the case of Nigeria, which is the largest producer of cassava in the world, this suggests that there is need for a concerted effort to transform cassava into tradable commodities, if Nigeria is to turn its production advantage into a competitive and trade advantage. This can be done with the suggested Cassava Processing and Trade Facilitation Zones.

The government should encourage the establishment of cassava processing companies close to the zones of production. This can be encouraged through the use of fiscal incentives, such as tax breaks or tax holidays for such companies, especially when located in economically disadvantaged zones, where their processing operations will help in job creation, with all the associated growth linkages with the rural economies. Government should target infrastructure provision into these zones, especially electricity, water, roads and communications.

In the case of Thailand, the government's facilitation of the provision of these market and trade enhancement public goods, and financing, has helped to create 200 cassava pellets manufacturing companies, producing 10 million tons of cassava pellets annually for Europe and China markets.

The combination of industrial, agricultural, fiscal and financial incentives is necessary to transform Nigeria's cassava sector from a disorganized and fragmented system into a well functional and coordinated system that is productive, efficient, profitable, and competitive in local, regional and international markets. The FGN should encourage the Nigerian Investment Promotion Council (NIPC) to promote this, through the activation of the Nigerian Industrial Development Act (Income Tax Relief) which allows the government to provide such incentives to promote "Pioneer Products", especially within economically disadvantaged areas.

To benefit from the Cassava Processing and Trade Facilitation Zones, it is important for Nigeria to diversify the utilization of cassava beyond its traditional forms, which is for Gari production. Food security is critical. But Nigeria produces a lot of cassava well beyond its national food consumption requirements. There is a need to create new markets for cassava for farmers.

Countries that are market leaders have moved beyond traditional uses to higher-end value added activities for which there is expanding market demand. The markets for cassava derivatives are expanding rapidly. China, which is one of the world's leading importers of cassava derivatives, is facing a huge deficit in livestock feeds due to decline in grain production. The conversion of maize into ethanol in the US, where some 30 million acres are being converted into ethanol production, is fueling high costs of feed stocks. At these high corn prices, cassava is competitive with corn for use in the production of modified starch for exports, and for use in livestock feed.

#### **2. Establish Cassava Market and Trade Development Authority**

To ensure that Nigeria takes advantage of these huge market opportunities, it is recommended that the FGN establish a Cassava Market and Trade Development Authority (CMTDA), with the responsibility for modernization and rapid commercialization of the cassava industry into a major foreign exchange earner for the country. This agency should be tasked with the following responsibilities: development of a vision for the cassava industry; facilitating the integration of cassava production, processing and marketing; coordinated investments in the "Cassava Processing and Trade Facilitation Zones" (at the state levels); providing support for research and development directed at making Nigeria a world leader in the cassava derivatives market; facilitating access to financing for farmers and processors; coordinating the supply chains; establishing and enforcing grades and standards; setting export targets for specific products; and providing timely access to market and trade information.

### **Policies for rapidly transforming the Nigerian agricultural sector**

The government is currently developing its strategic blue print of policies for agricultural development (2008-2011). This is laudable. No country has been able to achieve any significant growth in its agricultural sector, or structural transformation, without a well articulated strategy for food production, food self-sufficiency or food security, and clear articulation of the role of agriculture in spearheading economic growth and reduction of poverty. I will like to offer some suggestions for consideration in the development of this policy framework.

**Invest in agricultural research and rural infrastructure:** Nigeria has several universities and research centers. However, many of these institutions are poorly funded. Investments in agricultural research have declined. To develop a competitive agricultural sector a bold effort is needed to accelerate funding for agricultural research and to utilize existing agricultural universities to support generation of appropriate agricultural technologies and development of the needed human capita for building a competitive agricultural sector.

There is need to also expand investments in infrastructure that will help improve economic gains from technical change. The rapid uptake of improved maize varieties and fertilizers which spurred the transformation of the northern Guinea Savanna into a bread basket of Nigeria, came from massive investments in roads. Several areas of Nigeria can be turned into breadbasket areas with right investment in rural infrastructure to open up connection to markets, improve prices received by farmers and stimulate greater commercialization.

**Improve affordability of farm inputs.** First, it is critical that the government assure that farmers are able to afford agricultural farm inputs. The subsidized conversion of corn into ethanol in the USA and rapeseed into biodiesel in the EU, has led to expanded demand for fertilizers. Income growth in Asia (especially China and India) has led to increased demand for livestock and dairy, with significant impact on demand for fertilizers for production of feed grains. The price of fertilizers has risen dramatically on the global markets. For example, the price of DAP has risen from \$245 per ton in January of 2007 to \$1600 in May 2008. As rising food prices eat away at the expenditure budgets of poor households, especially the poor farmers who are net-buyers of food and who spend a disproportionately high share of their incomes on food, there is little left over for them to afford farm inputs. Unless urgent measures are taken by governments, this will lead to significant reduction in fertilizer use, with largely negative effects on food production and national food security.

There is clearly a need for subsidies. The FGN already subsidizes seeds (50%) and fertilizers, while it imports fertilizers through its Agricultural Development Projects (ADPs). The current system is inefficient and has high social losses as fertilizers do not get to the needy farmers. There is also politicization of fertilizer import, pricing and distribution, which create uncertainties and disincentives for private sector commercial importers. However, the current subsidy system is not targeted, which means that national resources are being used to subsidize wealthy farmers who can afford to purchase fertilizers at commercial prices, instead of targeting poor smallholder farmers. Besides, there is evidence that subsidized fertilizers from Nigeria ends up in neighboring countries, especially Niger, Benin and Togo. The current subsidy program can be improved by making them "smart subsidies" instead of general price subsidies on fertilizers. The federal and state governments should target smallholder farmers. Nigeria can learn from the experience of Malawi, where vouchers are used to target beneficiaries. Eligible farmers will redeem their fertilizer and/or seed vouchers from established agrodealer shops in rural areas.

**Development of agrodealer networks across rural areas:** Many farmers are unable to find fertilizers and seeds in rural areas and have to pay high transport costs to neighboring secondary towns or cities to get access. This raises the direct and indirect costs of the farm inputs and reduces incentives for farmers to use agricultural technologies. To improve the volume, range and timeliness of supply of agricultural inputs into rural areas, there should be a rapid development and expansion of agrodealers across rural areas of Nigeria. The International Fertilizer Development Center (IFDC) has been working over the past few years to develop agrodealers. But there numbers remain small and they lack financial support and access to capital to stock up on farm inputs. Experience from Malawi has shown that providing agrodealers with loans guarantees to banks can help unlock for them access to working capital to stock up their shops with seeds and fertilizers. For the last six years in Malawi, each dollar used as credit guarantee has led to an additional supply of 16 times worth of farm inputs by private traders to agrodealers in rural areas - or a capital leveraging ratio of 16:1. The national default rate has been less than 1% , a remarkable achievement.

It is recommended that the State governments embark on a major effort to scale up agrodealer networks. The FGN can then use these extensive networks of agrodealers to distribute subsidized farm inputs. This will lead to the achievement of two goals: access to farm inputs for farmers, while building the rural input markets and private sector operations.

**Innovative financing for agriculture:** One of the greatest paradoxes in development is that developing countries continue to rely on Official Development Assistance (ODA), despite the rapid growth of their own domestic financial markets. There exists significant excess liquidity in private banks in developing countries. The challenge is how to leverage this to work for agriculture, where risks of lending are high and returns often low. Innovative approaches are needed to leverage the liquidity in local financial markets. The solution is not always to create agricultural banks. The experience with agricultural banks, set up by governments, has not been good due to subsidized lending rates, poor management, corruption and weak provision of savings and loans to farmers. While microfinance may be helpful, they do not lend to agriculture as much as they do to informal non-farm activities.

AGRA is piloting a new way of working with banks through the use of loan guarantees to reduce their risk of lending to the agricultural sector. In Kenya, AGRA together with the International Fund for Agricultural Development (IFAD) to provide \$2.5 million each as loan guarantees to the Equity Bank of Kenya, to leverage the bank's lending operations into agriculture. As a result of the loan guarantee, Equity Bank set up a \$50 million loan facility for farmers, agrodealers, wholesalers and food processors in the agricultural value chain across Kenya. This represents a leveraging ratio of 10:1 and the single largest effort of any bank in Africa to lend to smallholder farmers and input distributors.

The Nigerian government established the National Agricultural and Rural Development Bank (NACRDB) with the goal of providing affordable financing for farmers. But the performance has been

poor. Rather than focus on a specialized agricultural and rural development bank, the government, through the Central Bank, could provide loan guarantees to existing commercial banks with extensive rural distribution networks to lend to the agricultural sector. This will achieve a significant leveraging of the excess liquidity in the financial markets into the agricultural sector and spur competition in agricultural lending operations and lower interest rates. Assume that a loan guarantee fund of \$100 million was established and that the capital leveraging ratio was 10:1. That means that \$ 1 billion of financing can be leveraged from the commercial banking sector. With that, who needs Official Development Assistance?

**Irrigation:** One of the major challenges facing African agriculture is its reliance on rainfed agricultural systems. Only 5% of arable land in sub-Saharan Africa is irrigated, compared to 42% in South Asia. Prediction from the International Panel on Climate Change (IPCC) suggests that African countries will experience more droughts in the years to come. According to model estimates the net effects of climate change in Africa could be as high as \$133 billion with agriculture bearing the most of the brunt – an estimated loss of \$132 billion.[1] Nigeria has a hugely underdeveloped irrigation capacity. The nation has an estimated total arable land area of 74.9 million hectares, out of which 120,000 ha is under irrigation. To reduce the impacts of climate change on food production and food supplies there needs to be a rapid expansion of the area under irrigation. Water harvesting, better use of underground water, development of new irrigation perimeters and better management of existing ones, with decentralized management to communities, should be pursued.

**Crop Insurance:** Farmers in Nigeria are exposed to the vagaries of nature and there is need for institutional arrangements to reduce these risks. In other parts of the world the use of weather-indexed crop insurance is being piloted. The insurance sector in Nigeria is very well developed but to date has not been engaged in developing and piloting such crop insurance schemes. There is a role for the government to facilitate the development of crop insurance schemes for farmers. The development of a viable, cost-effective and responsive crop insurance scheme for farmers in Nigeria is long overdue. The FGN can assist this by providing subsidies in the early stage of the institutional development and piloting stages. Once this has been developed and is viable the private sector should be allowed to take this to a commercial scale. The Federal Government could help set up an Agricultural Insurance Support Guarantee Fund to support innovations by insurance companies as well as needed agro-meteorology stations and systems needed for risk assessments.

**Establish staple crop processing zones:** The major challenges with staple food crops, especially root and tuber crops, are that they are bulky, are highly perishable, and have high transportation costs. As a result a large share of the production is lost between the farm gate and the market. There is need for a strategic investment approach to create a well coordinated system for producing, processing and marketing staple food crops. In the case of root and tuber crops, the government could establish staple crop processing zones, supported with good infrastructure, especially roads, water, electricity. Companies should be encouraged to set up processing facilities within these zones with fiscal incentives such as tax holidays and exemptions from duties on importation of processing equipments.

**Developing a new generation of commercial farmers:** The agriculture sector is rapidly ageing. With low profitability of agriculture and rapid rural-urban migration the question arises about how the country will be able to feed itself. There is a clear need to encourage younger generation of farmers. But they will not take up agriculture if the sector remains subsistence-focused. The global agricultural markets are dynamic and there is rising demands for grades and standards, and greater specialization, and market intelligence. Yet the population is growing rapidly putting greater pressure on the farming sector to meet food needs. There is need to therefore promote agriculture as a business not just as a way of life. The FGN should embark on a program to encourage young agricultural graduates to take up commercial agriculture. But supporting larger and commercial oriented farmers does not mean that the government should abandon smallholder farmers who still form the majority of the farming population. In addition, the government should create financial and investment incentives for private sector commercial investors in large scale agriculture. The government should avoid setting up public sector driven large scale commercial farms, as the experiences with these in the past have been negative.

#### **CLOSING:**

As I close, I recall when I was growing up in rural Nigeria where I went to school. I noticed then that the majority of the children of farmers were desperately poor and many of them could not attend schools. They were often sent away from classes. The productivity and profitability of their parents' farms were too low to support them. The Africa Green Revolution which AGRA is working on with African governments will help to change this in the very near future. Nigeria is the largest country in Africa. The green revolution should start here. If Nigeria achieves its green revolution it will lead to a major shift across all of Africa, just as India's green revolution spurred all of Asia to achieve the green revolution.