Africa Fertilizer Summit
9–13 June 2006 ▲ Abuja, Nigeria
Nourish the soil, feed the continent.

Background Papers

Achieving an African Green Revolution: A Vision for Sustainable Agricultural Growth in Africa

NEPAD

IFDC

Achieving an African Green Revolution: A Vision for Sustainable Agricultural Growth in Africa

Background Paper Prepared for the African Fertilizer Summit

June 9-13, 2006
Abuja, Nigeria

by

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Acronyms and Abbreviations

CAADP	Comprehensive Africa Agriculture Development Program
CASE	Competitive Agricultural Systems and Enterprises
NEPAD	New Partnership for Africa's Development
NPK	nitrogen, phosphorus, potassium
IFDC	International Fertilizer Development Center (an International Center for Soil Fertility and Agricultural Development)
IFPRI	International Food Policy Research Institute
ISFM	Integrated Soil Fertility Management
NERICA	New Rice for Africa

Executive Summary

Fertilizer will have to be a crucial component of any strategy to improve agricultural productivity in Africa. No country in modern history has made great strides in agricultural production without first increasing the use of fertilizer. At 20 kg NPK (nitrogen, phosphorus, potassium) per hectare and only 8 kg NPK per hectare in sub-Saharan Africa, fertilizer use rates in Africa are the lowest in the world. As a consequence, crop yields have stagnated in the past 45 years, causing food insecurity and, with increased area in cultivation, deforestation. Due to the increased population, farmers have had to abandon fallows, which has led to a crisis of soil nutrient depletion in the continent. With 65% of the labor force in agriculture, the widespread impacts of Africa's low agricultural productivity include continued poverty, reliance on food imports, low levels of investment, and, finally, political instability.

The Africa Fertilizer Summit is part of an effort to initiate a "uniquely African Green Revolution" called for by the United Nations Secretary General Kofi Annan. It emerges from the new dynamism in the continent, with stronger homegrown organizations, renewed emphasis placed on agriculture, new policies fostering the private sector, and greater interest in utilizing the continent's fertilizer resources. It will strongly contribute to the goals of the Comprehensive Africa Agriculture Program of the African Union's New Partnership for Africa's Development (NEPAD), which has established a goal of increasing agricultural production by 6% annually as a necessary step toward achieving the first Millennium Development Goal of halving poverty by 2015.

This is an African-led initiative with leadership by the African Union and its NEPAD program, and enjoys the strong collaboration of the Summit chair, H.E. President Olusegun Obasanjo, and of the Federal Government of Nigeria, the Summit host. An International Center for Soil Fertility and Agricultural Development (IFDC) is implementing the Summit while numerous donors, notably the Rockefeller Foundation, have provided support for this initiative.

This initiative has five main components:

- Mobilizing African governments, organizations, and civil society and raising awareness worldwide of the potential of fertilizer in improving the conditions of African smallholder farmers.
- Development of Country and Regional Fertilizer Strategies.
- Development of Africa Fertilizer Action Plan.
- Securing human and financial resources to implement the Action Plan.
- Implementation of the Action Plan and Strategies.

As an important step in this initiative, the Africa Fertilizer Summit will bring together African heads of state and ministers, leaders of international donor organizations, private-sector firms, farmers' organizations and senior policymakers to improve access of millions of poor African farmers to fertilizer and other complementary inputs, in order to help them raise their farm production and achieve food security. The Summit will consist of Technical, Ministerial, and Heads of State sessions. The Technical Session, to be held June 9-10, will emphasize breakout and panel sessions focusing on generating detailed actions needed. The Ministerial Session, to be held June 12, will discuss these actions and will submit its conclusion for the deliberation of the Heads of State on June 13.

The Africa Fertilizer Summit will be about action, not about talk. The horrendous human toll of underdevelopment in Africa is a constant reminder to ensure that the Africa Fertilizer Summit will not be another "talk shop." Instead, its initiators, organizers, and implementers are determined to ensure that it will result in bold actionable programs that will make fertilizer available to millions of farmers in a timely manner and at an affordable price. Achieving this and the "prosperous and peaceful Africa" as a result is not only in all of our interests, but it is also our responsibility.

Achieving an African Green Revolution: A Vision for Sustainable Agricultural Growth in Africa

"Let us generate a uniquely African Green Revolution—a revolution that will help the continent in its quest for dignity and peace."—Kofi Annan, Secretary General, United Nations

"If high yielding dwarf wheat and rice varieties are the catalysts that have ignited the green revolution, then chemical fertilizer is the fuel that has powered its forward surge."—Norman Borlaug, 1970 Nobel Peace Prize Laureate

I. Introduction

Overview

Achieving an African Green Revolution is central to the promotion of peace and prosperity on the continent. Agricultural productivity on the continent is low and stagnating due to limited use of modern inputs, such as fertilizer and improved seed, and due to the rapid decline in Africa's soil fertility. Across the continent, whether in the densely populated, volcanic soils of East African highlands or in the more sparsely populated West African savannahs, the continent's mainly smallholder farmers are seeing their soil impoverish and yields of their cereal, root, and vegetable crops decline, but have little ability to take action to remedy this situation.

No country in modern history has made great strides in agricultural production without first increasing the use of fertilizer, which provides the key nutrients needed by the crops. Intensifying agricultural production—in other words, obtaining a greater harvest per unit of farmed land—will be essential both for combating poverty and for preventing further deforestation and wildlife habitat destruction on the continent. Fertilizer will be a crucial component of any agricultural strategy to build the future of Africa. Nothing less is needed than the "uniquely African Green Revolution" called for by the United Nations Secretary General Kofi Annan.

The present initiative to increase fertilizer use in Africa started in August 2005 and the first phase of efforts will culminate in the *Africa Fertilizer Summit* to be held in Abuja, Nigeria, June 9-13, 2006. This Summit will produce *The Africa Fertilizer Action Plan*, a roadmap for halting the soil nutrient depletion in the continent and thereby improving agricultural production. The initiative is partnering with diverse stakeholders—most importantly, farmers' organizations, continental and regional organizations in Africa, African governments and civil society, the private sector, and the international donor community—in a joint effort to improve Africa's soils, its agricultural productivity, and thereby the wellbeing of its citizens.

"The Summit, to be held in Abuja, Nigeria, from June 9 to 13, 2006, is a critical milestone in Africa's quest to rapidly turn around its low agricultural productivity and accelerate food security for millions—especially for millions of malnourished children. The situation in Africa is very serious. It is almost embarrassing that it has taken us this long to come to the realization that we need to address the issue of fertilizer."

—President Obasanjo, March 30, 2006

This is an African-led initiative with leadership by the African Union and its New Partnership for Africa's Development (NEPAD) program, and enjoys the strong collaboration of the Summit chair, H.E. President Olusegun Obasanjo, and of the Federal Government of Nigeria, which will be the Summit host. The International Center for Soil

"The NEPAD goal for the sector is agriculturally led development, which eliminates hunger and poverty and food insecurity, thereby enabling the expansion of exports and putting the continent on a higher economic growth path …. "

—NEPAD CAADP document

Fertility and Agricultural Development (IFDC) is implementing the Summit while numerous donors, notably the Rockefeller Foundation, have provided support to this initiative and the Summit itself.

The Summit will call the world's attention to the potential of increased fertilizer use in solving the current agricultural crises in Africa. More importantly, it will develop the strategies that will overcome these crises and therefore the Summit will only be the beginning of a concerted effort to increase fertilizer use in Africa. It is expected that within 6 months of the Summit, a first set of actionable programs developed during the Summit will be initiated.

Now is the time for action to build a productive agriculture in Africa by initiating a Green Revolution on the continent. This will be the first step to improving the continent's food security and the wellbeing of its citizens. We look forward to your contribution to the Summit and an Africa Fertilizer Action Plan that will help build an "integrated Africa, a prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena" (African Union Vision Statement, 2004).

Background

In recent years, Africa's newly invigorated leadership has rightly committed itself to transforming agriculture on the continent as a way to address economic recovery and poverty reduction. In the 2003 Maputo Declaration, African countries pledged to allocate 10% of their national budgets to agriculture. The Comprehensive Africa Agriculture Development Program (CAADP), an initiative of NEPAD, has established a goal of increasing agricultural production by 6% annually as a necessary step toward achieving the first Millennium Development Goal of halving poverty by 2015. Equally, the international donor community, which has been generally reluctant to support agricultural development on the continent in the past 15 years, has renewed its commitment to agriculture as an engine to growth. Despite the low average fertilizer use in the continent, there have been successful models that have been employed in many African countries to increase fertilizer use and improve agricultural productivity; these models, in addition to the new commitment to agriculture, can be built on in future efforts to increase fertilizer use.

Summit preparations have been led by an advisory panel of world leaders in African development. In addition, a technical committee consisting of numerous government officials, technical experts, and representatives of donor institutions have advised and overseen the Summit preparations. The Summit organizers have also interacted individually and in meetings with numerous stakeholders throughout this past year. Two Secretariats, one based at NEPAD in South Africa and another at IFDC in the United States, have been directing the day-to-day technical work, while the National and Local Organizing Committees in Nigeria have taken the lead in making the local arrangements. A multi-institute Communication Strategy Group is raising awareness of the initiative worldwide.

Advance work for the Summit has involved the development of Country Fertilizer Strategies by numerous African countries and the preparation of Regional Fertilizer Strategies by the Regional Economic Communities; these Strategies outline the present status of the fertilizer sector, and propose concrete actionable programs to induce rapid growth in the regional and national fertilizer sectors. Their reports will be presented and discussed at the Summit. Furthermore, 8 back-

ground papers have been commissioned from leading international and African scientists based in development organizations, institutions, and universities to analyze Africa's fertilizer sector, the factors affecting performance of fertilizer in the continent, current constraints, and possible solutions to Africa's fertilizer situation. Many of these background papers have provided the basis for drafting of the current document.

While debate and discussion on these future strategies and actions will be most welcome, the pre-Summit deliberations have helped form a common understanding of the current situation in Africa and a broad consensus on the way forward. This consensus should prove to be an effective starting point for discussion. Put briefly, there is agreement that:

- *Africa's food security situation is quickly worsening*, and if not addressed through concerted, large-scale international efforts, the situation will become critical, requiring increasingly greater investments.
- *Soil nutrient mining*, caused by continuous cropping in the absence of fertilizer inputs, is an important contributor to food insecurity, poor agricultural productivity, deforestation, and loss of wildlife habitats, and is making many of Africa's formerly more productive farmlands nearly uncultivable.
- *Agriculture needs to be the number one priority in Africa's development agenda.* Agriculture employs at least 65% of the labor force and its performance has a direct impact on the food security and economic wellbeing of this large segment of the society, and numerous more indirect impacts on the performance of national economies.
- *Productivity-enhancing inputs, particularly fertilizers, have an indispensable role in achieving agricultural growth in Africa.* African farmers will use fertilizer if it is available to them at a price they can afford and when appropriate fertilizer blends and amounts are used, their crops do respond to it. Worldwide and in countries that benefited from the Green Revolution, fertilizers have fueled the growth of agricultural productivity.
- *Low fertilizer use in Africa is caused by a complex, challenging set of issues*, ranging from relatively high international product prices to inappropriate national policies, to weak rural input supply chains, to lack of trained retailers, to farmer ignorance on how to use fertilizer effectively. Future actions must therefore be multifaceted, and all stakeholders, including farmers and the private sector, will need to participate in its development and implementation. The private sector will have to be the main actor in the future fertilizer markets in the continent for sustainable development.
- *African farmers exhibit a willingness and drive to adapt in the face of many constraints.* Their abilities to farm productively can and must be enhanced by the actions and policies of governments, donors and civil society.
- *Increased fertilizer use in Africa will have positive environmental impacts* by decreasing agricultural pressure on forests, savannahs, and fragile lands. By boosting crop productivity, fertilizer will also improve soil organic matter in the long run. Combining inorganic fertilizer with organic inputs should be encouraged wherever possible, due to additional benefits that organic inputs have on soil fertility and moisture retention. Negative environmental impacts of excessive use or misuse of fertilizer can largely be prevented through research, extension, policy and legislation, and would benefit from the active participation of civil society.
- *Special arrangements for reaching Africa's poorest farmers*, who lack the resources to purchase fertilizer, will have to be made. To ensure that these arrangements positively contribute to the building of sustainable fertilizer markets, such arrangements will have to be organized in a market-friendly fashion.

In this paper, we will show the many negative consequences of the current low fertilizer use in Africa and demonstrate how increased fertilizer use worldwide has led not only to greater food production but also to better

protection of natural resources. After reviewing the many challenges affecting the fertilizer sector in Africa, we will describe the numerous positive developments in the continent that give us a great deal of hope and guidance in future efforts. We will close by describing the present initiative, its components and stakeholders, and then focus on the crucial step in improving agricultural productivity through increased fertilizer use in Africa—the Africa Fertilizer Summit.

II. The Case for Fertilizer

This initiative, keeping in step with the African Union leadership, encompasses the entire continent of Africa. As readers are well aware, there are large differences among the continent's various regions regarding the issues discussed in this paper: agroecological zones and farming systems, food security and agricultural production, soil nutrient mining, fertilizer use and manufacturing, and factors impacting the fertilizer sector. In general, the countries of North Africa and the Republic of South Africa have higher levels of food security, agricultural production, and lower soil nutrient mining rates. Moreover, these countries are also fertilizer producers, unlike most of the countries of sub-Saharan Africa. There are also relatively large differences among the countries in the rates of fertilizer use, with North Africa and the Republic of South Africa having relatively high use levels. Sub-Saharan countries all have clearly insufficient fertilizer use rates but vary in absolute amounts and in growth trends in fertilizer use. In the development of the Africa Fertilizer Action Plan, these regional differences may be seen as strengths as regional synergisms can be exploited.

The Crises in Food Security and Soil Nutrient Mining

Africa is the only continent where, year after year, *the number of those affected by food insecurity is on the increase*. The problem is multifaceted, comprising deficiencies of calories, protein, and/or micronutrients, with varied impacts on different segments of the population. Its causes are also varied, involving typically insufficient production, lack of purchasing power, and/or lack of availability of foods. As mentioned, food insecurity affects the population of sub-Saharan Africa more than in North Africa: one third of the population in sub-Saharan Africa is undernourished, whereas this figure is only 6% in North Africa. Chronic undernourishment is the continent's perennial silent killer, while acute periodic famines require international intervention, capture more media attention, and affect up to 40 million Africans yearly. The impacts on children of food insecurity and consequent malnutrition are particularly severe and long-term, as demonstrated in a study by the International Food Policy Research Institute (IFPRI):

- Of children under age 5 in sub-Saharan Africa, 38% are moderately to severely stunted. Regional variation is great, with East and Central African countries having the highest rates in 1999-2001.
- Current estimates identify sub-Saharan Africa as the only region in the world where the number of malnourished children will increase between 1995 and 2020. The increase is expected to be on the order of 30%, amounting to an estimated total of 40 million children.
- Micronutrient deficiencies of vitamin A, iron, and zinc are widespread and result in lowered resistance to infection and intellectual capacity, among other serious health effects. These deficiencies can be overcome with better nutrition.

A second agricultural crisis, one that has received far less attention, is insidiously depleting the very basis of food production in Africa—the continent's soil. Soil nutrient depletion is quickly worsening and affecting a growing area of Africa's farmland. Its effects are particularly hard felt in a continent where inherently poor soil fertility prevails in most areas (see box). As discussed by Bationo et al. in one of the Summit Background Papers, currently only 16% of Africa's soils are estimated to be of high quality and 13% of medium quality; these 29% of the soils support 45% of Africa's population.

"People suffering from hunger are marginalized within the economy, contributing little to output and still less to demand; they are also constantly vulnerable to shocks. Agriculture-led development is fundamental to cutting hunger, reducing poverty, generating economic growth, reducing the burden of food imports, and opening the way to an expansion of exports.
—(CAADP document)

Africa's population growth, at 2.4%, the highest in the world, is worsening food security and soil nutrient depletion on the continent. According to the United Nations, the population of the continent is projected to increase by 70%, equaling 490 million new inhabitants, between 1995 and 2020. The population growth lowers per capita food availability even in those countries with positive agricultural productivity gains. Traditionally, farmers in sub-Saharan Africa had cleared land from forest, grown a few seasons of crops, and then have left the land fallow for many years. This bush fallow system was sustainable and effective in the pre-modern conditions of low population density. Due to the population growth in recent decades, however, the pattern has changed, the fallows have shortened, and in many locations, farmers are now growing one crop after another.

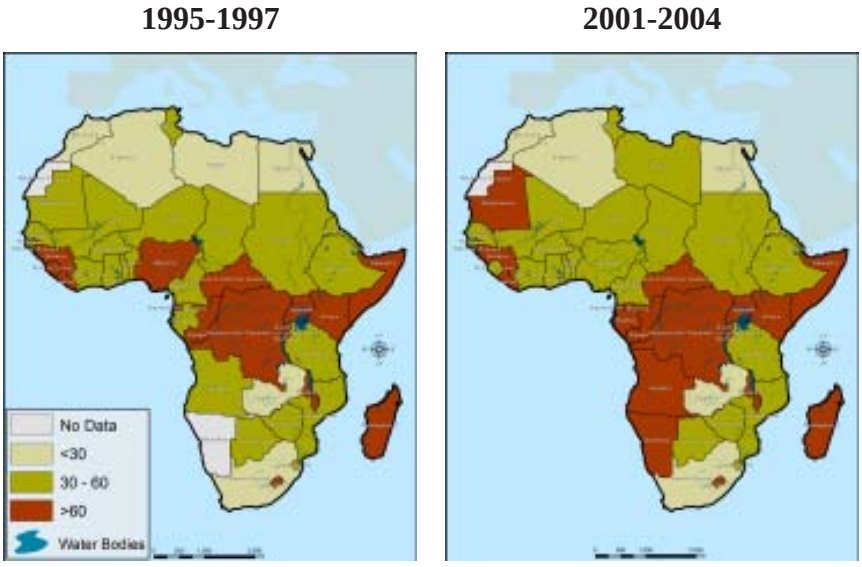
At application rates of less than 10 kg of nutrients per hectare in sub-Saharan Africa, fertilizer use in the continent is extremely low and most farmers do not have sufficient organic resources of good quality—such as animal or green manures—needed to replace replenish the soils. Diminishing nutrient content in the soil results in declining crop yields, further degrading the soil and increasing soil erosion due to diminished crop cover. The term "nutrient mining" refers to the situation where the nutrients extracted from the soil are not fully replenished. The situation is so severe that two World Food Prize Laureates have called it a "catastrophe."

A recent report by Henao and Baanante, to be released in the Africa Fertilizer Summit, fully documents the widespread nature and severity of the soil nutrient mining. During the 2002-2004 cropping seasons, 85% of African farmland had annual nutrient mining rates exceeding 30 kg per hectare of nutrients, and 40% of them had rates considered severe, exceeding 60 kg of NPK ($N+P_2O_5+K_2O$) per hectare yearly (Figure 1). The situation since the previous assessment in 1995-1997 had worsened in most countries. The report demonstrates the variability in the extent of nutrient mining, with sub-humid savannas of West Africa and highlands and sub-humid areas of East Africa having the highest rates. In contrast, the North Africa region and South Africa have lower rates, from 0 to 30 kg of NPK per hectare. The total

Africa's Poor Hand

In general, Africa lacks the broad fertilized alluvial plains, which are the "breadbaskets" of other continents. Only a few areas, such as the volcanic highlands of East Africa, have inherently high soil fertility. Africa has therefore been dealt a poor hand in terms of agricultural lands. Based on soil quality and climate, the agricultural lands of Africa can be classified in the following categories:

- **Fragile, easily degraded lands occupy 55% of Africa, and require very high investments to be productive.**
- **Prime land occupies only 9.6% of Africa. These have soils with deep, permeable layers, with an adequate supply of nutrients and no significant periods of moisture stress. They are found in significant areas in West Africa south of the Sahel, in East Africa mainly in Tanzania, and in the southern African countries of Zambia, Zimbabwe, South Africa, and Mozambique.**
- **High potential land occupies 6.7% of Africa. They are similar to the former, but with some minor limitations such as extended periods of moisture stress, sandy or gravelly soils, or restrictions in rooting layer. They can be productive with proper land management.**
- **Medium to low potential lands, occupying 28.3% of the land areas, have major soil constraints and one or more minor constraints, which can be corrected through management. Large areas in West and Central Africa are considered of medium potential. Technical assistance and *implementation of appropriate soil management practices is particularly important in these areas.***



Source: Henao and Baanante, 2006

Figure 1. Nutrient Mining in Agricultural Land of Africa, 1995-97 vs. 2001-04

amount of nutrients mined annually in sub-Saharan Africa is estimated at about 8 million metric tons (tons) of nitrogen (N), phosphorus (P), and potassium (K). Other studies have documented similarly high soil nutrient depletion and degradation rates. Altogether, the net value of nutrients lost in Africa in terms of the fertilizer cost of nutrients is estimated at $4 billion per year. The authors summarize: "The evidence leaves no doubt that the very resources on which African farmers and their families depend for welfare and survival are being undermined by soil degradation caused by nutrient mining and associated factors such as deforestation, use of marginal lands, and poor agricultural practices."

Continued soil nutrient mining results in lower yields and thereby food insecurity. It forces farmers to move on to clear new lands, causing deforestation and loss of wildlife habitat. With over 70% of Africa's poor living in rural areas, the vast majority of whom rely on agriculture as their source of livelihood, the farmers' poverty trap translates into a national poverty trap. As Henao and Baanante point out, "continued nutrient mining of soils would mean a future of even increased poverty, food insecurity, environmental damage, and social and political instability." Some of the far-reaching efforts of the decreasing agricultural productivity are briefly summarized below:

- *Continued poverty:* Of the world's 50 Least Developed Nations, 34 are in Africa. Almost one-half of its population, 47%, live on less than $1 per day and World Bank estimates that 70 million Africans joined the ranks of the absolute poor during the 1990s. In recent years the general economic performance has been positive, but IFPRI projects that Africa's average per capita income will rise from $279 in 1995 to $359 in 2020; a mere 28% rise. The next region in severity of poverty, South Asia, is expected to increase its per capita income by 137%, to $830.
- *High and increasing levels of food imports:* Food imports are sapping countries of valuable hard currency and further worsening economic performance. In 2003 Africa imported 43 million tons of cereals at a cost of $7.5 billion; the largely agrarian countries of sub-Saharan Africa alone (excluding South Africa) imported 19 million tons at $3.8 billion. Without a decisive change in the next decade, food imports to Africa are expected to increase to 60 million tons at a cost of $14 billion, with 34 million tons of it going for sub-Saharan Africa excluding South Africa.
- *Low levels of investment:* As pointed out by President Obasanjo in the March 30, 2006 preparatory meeting, at the individual and national level, low incomes give little opportunity to invest. "This in itself is one of the roots of poverty and underdevelopment in Africa: the lack of surplus to invest in production, research, innovation, recreation and savings." This further curtails Africa's ability to effectively respond to health calamities such as HIV/AIDS and malaria

or make the needed investments in education, infrastructure, and other development priorities.

- *Political instability*: Often a result of poor economic growth, political instability afflicts the region and further exacerbates poverty. The number of sub-Saharan countries suffering from war or severe conflicts went from 11 in 1989 to 22 in 2000. In countries with (or emerging from) armed conflict, undernourishment rates were over 50% in 1999-2001.

These continental struggles are repeatedly mirrored in regional and national struggles and, finally, in the lives of individual African farmers who find themselves in a poverty trap: working hard for insufficient and risky yields. It is those struggles—that of the continent, the countries, and the farmers—that this initiative is seeking to assist by empowering African farmers with tools to increase their productivity and thereby lift themselves out of poverty, produce a surplus they can trade domestically and regionally and eventually become a viable part of the global agricultural community.

The Impact of Inorganic Fertilizers

Role in Improving Agricultural Productivity: A Global Perspective

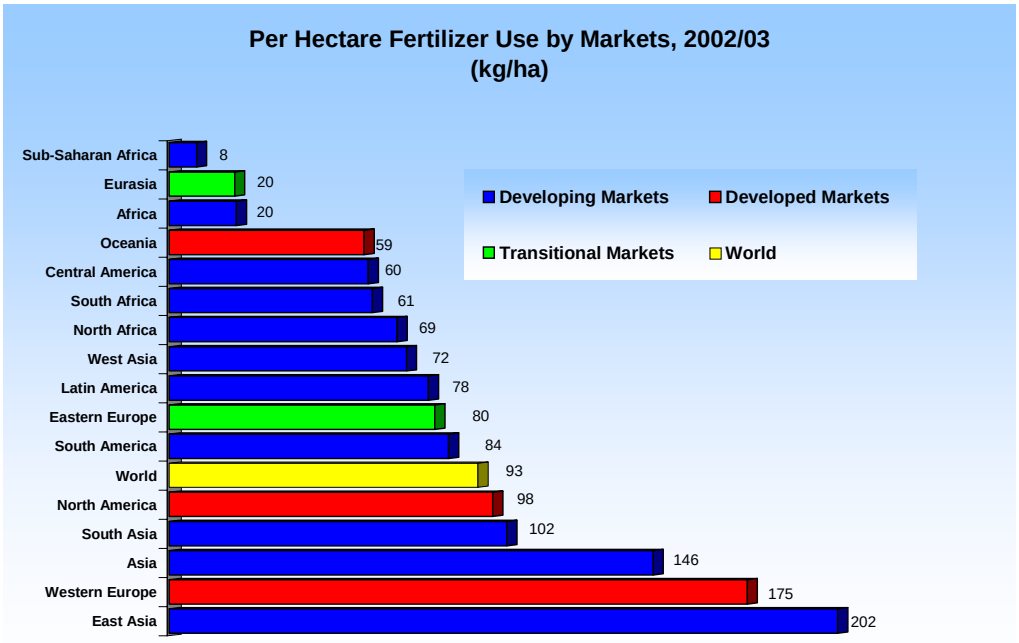
Fertilizers supply the nutrients that a plant requires for growth. Most commonly, they include a combination of NPK. Commercially available fertilizers will often also include other nutrients or micronutrients, defined as those that are required in extremely small amounts but can severely inhibit plant growth when absent. The mineral or inorganic fertilizers are manufactured in factories in diverse processes; nitrogen is captured from the air in an energy-intensive process (usually utilizing natural gas) while phosphorus and potassium are mined from the earth and thereafter processed. In contrast, the organic fertilizers—such as livestock manure and green manure/cover crops—are usually produced on the farm.

As mentioned previously, no modern country, industrial or developing, has improved its agricultural productivity and economic wellbeing significantly without increasing its inorganic fertilizer use. Worldwide, several studies have indicated that one third of the current global cereal production can be attributed to fertilizer and related factors of production. Fertilizer was a crucial component of the Green Revolution, which raised yields and incomes in Asia beginning in the 1960s, because it accounted for a full 50% of yield growth in Asia during that period. Dr. Norman Borlaug, "the Father of the Green Revolution" and Nobel Peace Prize Laureate, has called the improved seeds "catalysts that ignited the Green Revolution," and mineral fertilizer the "fuel" that powers it. The crop yield increases resulted both in short- and long-term positive effects on the poor. In India, for example, a 10% increase in crop yields reduced the number of poor by 4% in the short run, and by 19% in the long run.

Africa consumes the least quantities of inorganic fertilizer, both in absolute terms and per hectare, of all regions. Across the continent, the average use rate is 20 kg NPK per hectare (Figure 2). Regional differences are great, ranging from North Africa and South Africa, which consume 61 and 69 kg per hectare, respectively, to the sub-Saharan region where average consumption is just 8 kg per hectare. Fertilizer use is low in the production of staple foods. There are pockets of fertilizer use in the peri-urban vegetable production and in non-traditional export crops across the continent. In contrast, the average worldwide rates are 93 kg of NPK per hectare and those in South Asia, 102 kg per hectare. Average use rates in East Asia are very high, at 202 kg of NPK per

"We learned crucial lessons in our experience with the Green Revolution in Asia and Latin America. We learned that there can be no hope for improving agriculture and increasing food production if farmers do not have the fundamental tools they need, and that includes fertilizer."

—Dr. Judith Rodin, President, the Rockefeller Foundation, March 30, 2006, the Eminent Advisory Group Meeting

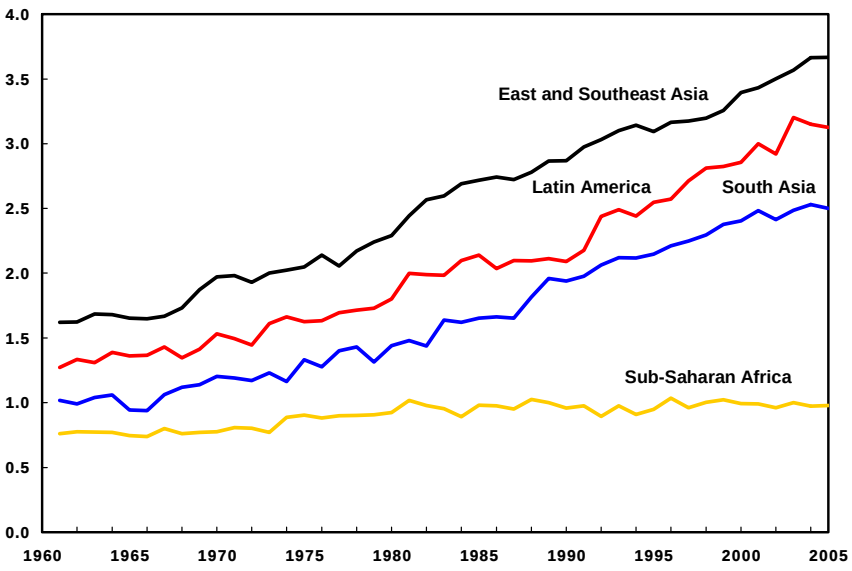


Source: IFDC.

Figure 2. Average Per Hectare Fertilizer Use Rates as Kilograms of Nutrients (NPK) Per Hectare by Fertilizer Markets in 2002-03

hectare, and a cause for concern due to potential negative environmental impacts.

Crop yields in Africa have stagnated in the past 45 years (Figure 3). While average cereal yields in East and Southeast Asia have more than doubled, those in sub-Saharan Africa have increased little. Roots and tubers, important staples in sub-Saharan Africa accounting in many places for 20% of caloric consumption, have experienced a slightly larger yield increase, but current yields greatly lag behind those in the other regions. Per capita food production in sub-Saharan Africa has in fact declined in the past decades. Since food production has not kept pace with the population growth rate, cereal imports have grown greatly in the conti-



Source: World Bank.

Figure 3. Cereal Yields in Different Developing Regions From 1960 to 2005

"By 2050, our population is projected to increase by 1.3 billion people over the base year of 1995. Sustainable development requires efforts to meet the food needs of this rapidly growing population, while conserving our natural resource base for future generations. The only sustainable option is to increase agricultural productivity."

—President Obasanjo

nent, from 21.5 million tons in 1980, to 27.6 million tons in 1990, and 41.1 million tons in 2003.

Whereas the great strides in agricultural production in South Asia were mainly caused by increased cereal yield, the modest gains in sub-Saharan Africa in the same period were attributable mainly to area expansion. In South Asia, the agricultural area dedicated to cereal production increased only by 15% between 1961 and 2001 (from approximately 111 to 128 million hectares), but yields increased from approximately 1.2 to 2.5 tons per hectare or by 144%. Total South Asian cereal production almost tripled, from approximately 113 million tons to 318 million tons.

In the same period, sub-Saharan Africa increased its cereal production by almost 146%, from 31 to 77 million tons. Increases in yield, however, were modest, from 760 to 990 kg per hectare, and therefore accounted for only 30% of that increase. Instead, the greater source of increased cereal production in the region was area expansion, as area harvested increased from 41 million hectares to 78 million hectares, an 89% increase. Figure 4 depicts this stark contrast in sources for growth between South Asia and sub-Saharan Africa, with 1961 yield and area indexed to 100. This same trend of slower growth from yield is true also for many of Africa's other crops, such as roots and tubers (1970-2000 annual area expansion was 1.7% whereas that of yield was 1.0%), vegetables (1.9% vs. 0.8%), oil crops (0.9% vs. 0.7%), and fruits (1.6% vs. 0%).

In other words, in the 40-year period from 1961 to 2001, African food production rose mainly because more land was brought under cultivation, but crop yields per hectare stagnated. Due to greater population, in many areas of the continent continued area expansion is no longer an option and instead, Asia's path of agricultural intensification needs to be followed.

"The simple but brilliant approach to improve crop yields—high-yielding varieties that respond to key inputs, especially fertilizers—still has not found its home in our vast continent of 900 million people. Crop productivity in Africa has mostly remained stagnant over the past four decades, while cereal yields in Asia have risen three-fold, to 3.5 tons per hectare, in the same period. Our malnutrition has worsened, and stability is increasingly difficult to maintain."

—President Obasanjo

Role in Improving the Environment

There are those who oppose efforts to increase fertilizer use in Africa on environmental grounds. These opponents are well-intentioned because they feel that Africa should be spared the negative consequences of misuse of fertilizer, such as groundwater contamination or soil acidification, which have been evident in some other locations. Instead, they argue that the continent should rely heavily or exclusively on organic fertilizers, such as green manures, cover crops, and livestock manures.

Inorganic fertilizers can, indeed be harmful to the environment, but only when misused (Text Box). Such misuse can be of different kinds: excessive applications; unbalanced applications (i.e., containing an improper ratio of nutrients for a particular soil or crop); or application of a fertilizer type that causes acidification in a given soil. The harmful impacts of excessive and unbalanced applications have been evident in, e.g., some of the intensive rice systems of Asia and intensive wheat systems of Mexico, where fertilizer use rates are often ten times higher than the average rates in all of Africa, and more than twenty times higher than those in sub-Saharan Africa. Very high rates are seldom seen

Negative and positive impacts of fertilizer

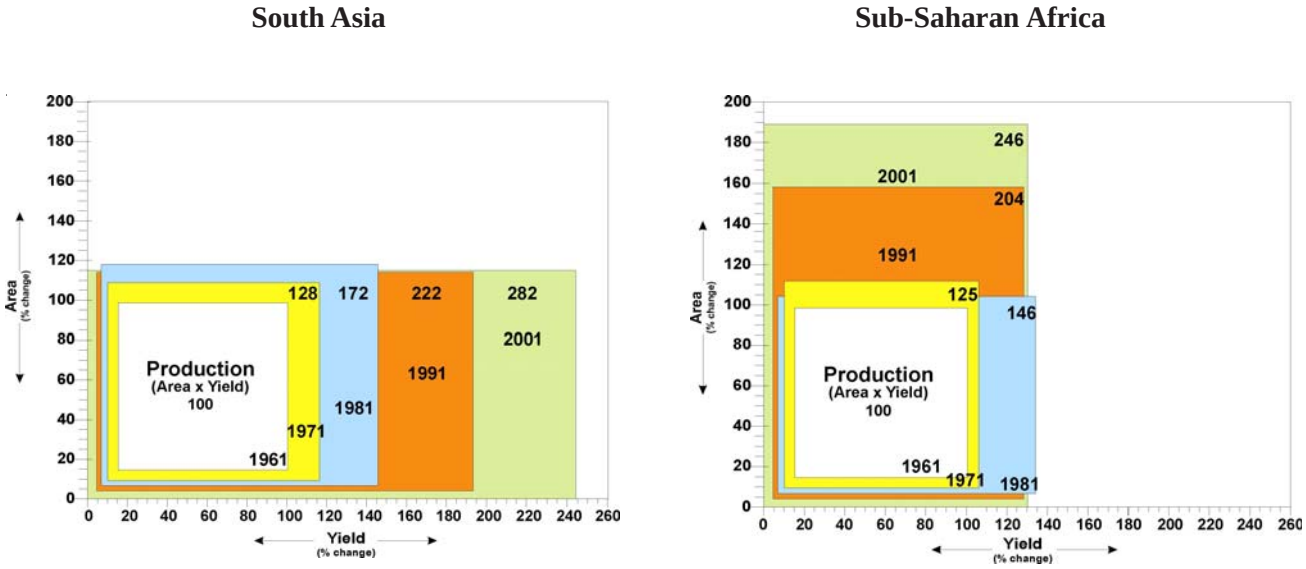
Negative impacts include:

- **Excessive amounts of fertilizer can cause pollution. The crop can only take up those nutrients it needs and the rest can escape into the environment. Excessive fertilizer use rates, particularly nitrogen, are found in many of the intensive rice systems of Asia. What level constitutes an excessive rate can be considered both, in terms of the whole cropping season or at a particular time of crop growth. In Africa, however, this is not a current problem; in fact, nutrient inputs are lower than outputs for all nutrients.**
- **Inappropriate balance of nutrients in a fertilizer can lead to pollution. If nutrients not needed by a crop are present in the fertilizer, they can escape into the field and end up as water pollution.**
- **Inappropriate fertilizer for the given location can cause acidification. If ammonium-based fertilizers are used in soils that are prone to acidification, negative impacts may occur.**

In short, when right kinds of fertilizers for a given crop and the environment are used in correct quantities, fertilizers do not harm the environment.

Fertilizers also have numerous positive impacts on the environment, some of them direct, others indirect. Positive impacts include:

- **Increased soil fertility, leading to numerous environmental benefits. Erosion is decreased in areas where vegetation covers the soil. Mining of soils of nutrients is prevented, leading to prevention of a vicious cycle that can lead to completely degraded soils and ecosystems. Moreover, larger root mass and crop residue mass increases carbon sequestration in those systems where no tillage is used and therefore, decomposition is slower.**
- **Reduced need to clear natural vegetation: Higher yields as a result of fertilizer use mean that needs for sufficient food are met with less area in cultivation at various levels: household, community, regional, and national levels. In Africa in the recent decades, farmers have had little choice but to increase area under cultivation to compensate for low fertilizer use.**



Source: IFDC.

Figure 4. Growth of Cereal Yield and Area in Cereal Production in South Asia and Sub-Saharan Africa Between 1961 and 2001 (1961=100 for yield and area)

in Africa except for a few areas of irrigated, peri-urban production of horticultural and floricultural crops and in some areas of South Africa and Egypt where high rates are common in irrigated agricultural lands.

What has often been overlooked are the numerous positive impacts of fertilizers on the environment, so aptly demonstrated in Figure 4. The large area expansion in farmland in sub-Saharan Africa comes at a high cost; it has been estimated that currently 70% of the deforestation in Africa is a result of clearing land for cultivation. Conversion to farmland is also threatening the fragile ecosystems that support Africa's great wildlife such as the Serengeti in East Africa and in the more fragile, arid areas, contributing to desertification.

There are other environmental benefits from inorganic fertilizer use. Soil fertility is increased as the nutrients lost from the soil are replenished. Healthier crops mean increased crop cover and greater root biomass, which reduces erosion and builds up organic matter in the soil increasing water-holding capacity and microbial activity.

Although organic fertilizers, such as livestock manure or cover crops, positively impact soil quality, there are many reasons why improving food security and increasing soil fertility in Africa cannot rely on organic fertilizer alone. The quantities of organic fertilizer that are required to have a positive impact on soil are large and therefore require extensive areas for production (either the cover crops or the fodder feeding the animals). Due to their large volumes, they usually have to be produced *in situ*, which is difficult in areas of land pressure. Moreover, the quality and quantity, i.e., the nutrients they contain, of organic resources are highly dependent on the fertility of soil in which they are produced. In a poor soil, plant growth and nutrient content is low. If applied on the soil as a cover crop or green manure, the positive impact on soil and crop growth is relatively small. Similarly, if livestock is fed with low-quality fodder, the resulting manure is of poor quality. Paradoxically therefore, organic resources can often be produced best in conditions where they may be needed least, in good quality soils with low population pressure.

Combining inorganic fertilizer with organic resources in practices such as is beneficial in many conditions. The organic component improves soil organic matter, commonly low (<2%) in Africa's soils. It can also increase the efficiency by which mineral fertilizers are used, thereby reducing amounts of fertilizer needed. The organic fertilizers have numerous other benefits besides the environmental ones, including, in the case of manure on livestock farms and when cover crops are grown by farmers, their availability on the farm.

Collaboration and consensus between those advocating inorganic fertilizer and those calling for organic sources should therefore be the approach for increasing fertilizer use in a sustainable manner. To ensure that a proper combination and amount of nutrients are delivered to the plant, fertilizer recommendations should be tailored to location-specific nutrient needs. When the right varieties and good crop management techniques are used, less fertilizer produces a higher yield. For every one kilogram of nitrogen fertilizer applied, North American farmers get 35 kg of maize, whereas African farmers currently get only 7 kg.

III. Africa's Fertilizer Challenge

Increasing fertilizer use in the African continent will be a complex task because lessons learned in Asia and Latin America cannot be simply replicated due to the unique nature of Africa's environment, both biophysical and socioeconomic. Unlike in South Asia, where irrigated agriculture prevails, Africa's agriculture is predominantly rainfed, relying on uncertain and variable rainfall in many locations. Only 3.9% of Africa's arable lands are irrigated whereas 40% of those in Asia are. Africa's farming systems are also complex and diverse, and there is no single system, such as that involving rice or maize, on which

food security of the population largely depends (Text Box).

The low average fertilizer use rates in Africa are due to a complex set of factors that range from fertilizer production to its farm-level application and are biophysical, socioeconomic, and political. Africa's fertilizer challenge can only be solved by awareness of these constraints and directing resources to overcome them, whether they affect the supply of or the demand for fertilizer. In several locations this will require consideration of methods to decrease the risk of fertilizer use through improved irrigation infrastructure.

African Farming Systems

The recent InterAcademy Council study characterized farming systems in sub-Saharan Africa in the following manner:

- **Lack of a single dominant farming system on which food security largely depends.**
- **Predominance of rainfed agriculture as opposed to irrigated agriculture.**
- **Heterogeneity and diversity of farming systems and the importance of livestock.**
- **Key roles of women in agriculture and in ensuring household food security.**
- **Lack of functioning competitive markets.**
- **Under-investment in research and development and infrastructure.**
- **Dominance of weathered soils of poor inherent fertility.**
- **Lack of conducive economic and political enabling environments.**
- **Large and growing impact of human health on agriculture.**
- **Low and stagnant labor productivity and minimal mechanization.**
- **Predominance of customary land tenure.**

Fertilizers and Water

Lack of adequate soil moisture is an important constraint to crop production in Africa. As described by Bationo et al. in a Summit Background Paper, much of Africa is semi-arid and arid, and the low rainfall is compounded by the fact that the majority of the soils in the continent have poor capacity to hold and release moisture. Only 10% of Africa's soils have high to very high available water-holding capacities and in another 29%, water-holding capacity is medium. As a consequence of the rainfall and soil quality, it has been estimated that only about 14% of Africa's land area is relatively free from moisture stress. To compound these two factors, drought incidence in the continent has increased by four times since 1975 and irrigation is available only on 3% of Africa's farmlands.

Fertilizer and water have strong interacting effects. Fertilizer use efficiency is far greater with good water availability. Wicheln, in a Summit Background Paper, reviews different water harvesting techniques to increase soil moisture retention and thereby crop yield, such as simple bunds and barriers, tied-riding of planted surfaces, contour furrows, and others. Making water accessible to farmers through irrigation and water-harvesting techniques needs to be therefore incorporated in the future efforts.

Supply-Side Factors

Fertilizer supply in sub-Saharan Africa is commonly costly, inadequate, and untimely, and therefore is a major constraint to increased fertilizer use in the region. Most of the fertilizer produced in the continent is manufactured in the North African countries and South Africa. Most of sub-Saharan Africa relies on imported fertilizer, purchased at international prices. A notable problem with dependence on international supply is price instability; international fertilizer prices have high variability, which is further increased by devaluations of local currencies. The small quantities of fertilizer purchased at the national level tend to further increase the price, through the phenomenon of poor economies of scale.

Most of the costs of fertilizer procurement, distribution, and marketing are higher in Africa than elsewhere, as shown by Bumb and Gregory in a Summit Background Paper. Such costs per ton average out to a farmer price in the United States of $227, for Nigeria $336, for Malawi $321, for Zambia $333, and for Angola $828. Costs in the four African countries were found to be higher for insurance, port costs, losses, storage and truck loading, interest, importers margins and dealer costs and margins, among others.

Fertilizer supply can also be erratic and it is often completely unavailable in small towns and

villages. Farmers commonly have to travel average distances of 30-50 km to buy fertilizer. Ironically, due to the unrestrictive policy environment, appropriate pricing and product, good distribution, and effective promotion, smallholder farmers in sub-Saharan Africa can usually find Coca-Cola products—a luxury item with little relevance to improving their lives—whereas supplies of fertilizer, a key item to improve their productivity, are hard to obtain. This is in part explained by the fact that development of an effective and efficient fertilizer supply to farmers is far more difficult and complex than distributing and marketing of Coca-Cola. The Summit Background Paper by Bumb and Gregory (2006), differentiate the constraints affecting fertilizer supply into those related to market development vs. those that are technical and infrastructural.

- *Market development constraints* include:
  - *Uncertain policy environment* related to fertilizers, including unexpected public sector subsidies that deter the development of a private sector retailer network.
  - *Inadequate human capital*, both in terms of the number of rural farm input dealers and the quality of their services.
  - *Poor access to finance* by importers and dealers.
  - *Lack of market information*, which discourages market transparency and information flow, makes planning difficult, and leaves information accessible only for local actors.
  - *Weak fertilizer marketing regulatory systems* for quality, standards, measures, safety, and business ethics, all of which hinders consumer protection.
  - *Small size of the markets*, preventing economies of scale in importation.
- *Technical constraints* include:
  - *Outdated and blanket fertilizer recommendations*, with most recommendations to farmers in sub-Saharan Africa dating to trials that were conducted in the 1970s and early 1980s. They do not therefore account for changes in soil fertility, cropping patterns, cropping mixes and economic realities.
  - *Lack of knowledge by farmers* of correct fertilizer use, resulting in waste in countries such as Tanzania, where maize farmers mainly topdress their maize instead of doing basal fertilizer applications.
- *Infrastructural constraints* are of two kinds:
  - *Poor roads*, both main roads and feeder roads, lead to increased transportation costs, increasing fertilizer price. Only a few countries have made headway in building gravel roads. This constraint affects particularly those countries that are landlocked, which can incur $50-100 costs per ton of fertilizer for transport to borders.
  - *Physical insecurity* discourages development of rural input supply stores in certain areas. Dealers in e.g., Nigeria, Malawi, and Zambia have reported that a hindrance to selling fertilizer in villages is the fact that their stocks would not be safe.

Demand-Side Factors

On the other end of the spectrum, farmer demand is also poor. As described in the Summit Background Paper by Crawford et al., among others, factors impacting smallholder farmer demand for fertilizer can usually be expressed with respect to two issues that farmers face:

- *Poor ability to acquire the desired amount of fertilizer and use it effectively*, as a result of the following factors and circumstances briefly described here:
  - Inadequate fertilizer recommendations, caused in part by poor funding for research institutes.
  - Poor capacity of researchers to communicate recommendations to extension.
  - Lack of sound strategy for targeting appropriate technologies and skills to specific locations.
  - Poor effectiveness of efforts to disseminate technologies to all farmers.
  - Poor monitoring and evaluation of technology dissemination efforts and impact.
  - Long distances to input suppliers and lack of working capital.

  - Inconsistent agricultural policies, making it difficult for the farmer to properly assess the benefits of fertilizer use from one year to the next.
  - Poor adult literacy rates among the farmers.
- *Poor profitability of fertilizer use,* both absolutely and relative to alternative expenditures. This issue relating to incentives for fertilizer use is associated with the following three factors: (1) crop response to fertilizer nutrients, (2) input/output price ratios, and (3) net returns from crop production. In reviewing the evidence, Crawford et al. find poor incentives for millet and to some extent sorghum. Cotton, although it has relatively poor yield response, has average profitability. In contrast, incentives for maize, irrigated rice and tea are good. In their Background Paper, Bationo et al. report similar good yield response of maize to fertilizer in Togo, with an increase of 142 to 201% with fertilizer, and with even greater benefits possible if fertilizer is used in combination with organic residues.

IV. Our Vision for Africa's Agriculture

Goals for Increasing Fertilizer Use on the Continent

To achieve the first Millennium Development Goal, halving poverty on the African continent, requires greatly increased agricultural productivity and drastic reduction in the rate of soil nutrient mining. This calls for intensification, increased fertilizer use, and greater use of other key inputs.

To achieve this target, NEPAD has determined that annually, African agricultural productivity needs to increase by 6%. According to the calculations of IFDC, for crop production to achieve this target, and for soil nutrient mining to decrease by the year 2015, the average fertilizer use rates in Africa should considerably increase from the current 20 to 47 kg of nutrients per hectare. In sub-Saharan Africa, where the current use rates are exceedingly low at 8 kg of nutrients per hectare, the rates should increase to 40 kg per hectare. To achieve these targets, fertilizer use should increase by 6% annually, a considerable task requiring a concerted effort to accomplish it.

Cause for Hope for Achieving an African Green Revolution

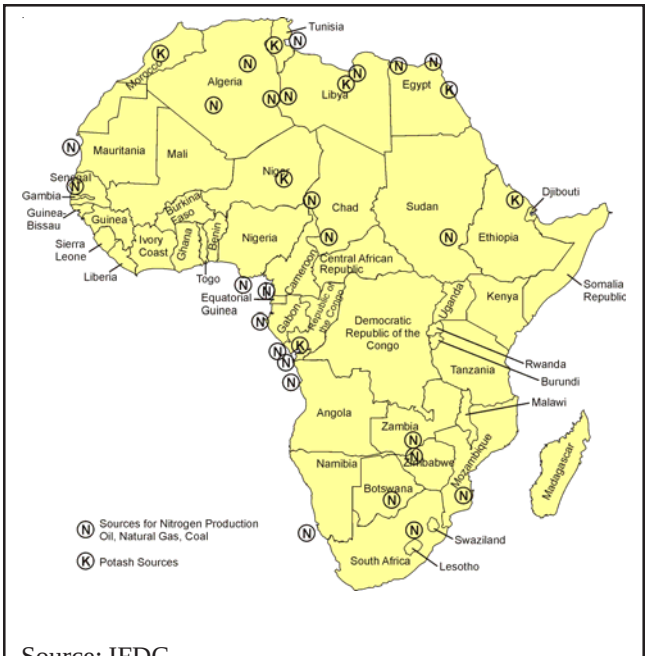
In the past decade there have been many hopeful changes in the African political and economic landscape and positive developments and experiences, which will lay a foundation for an African Green Revolution if exploited wisely and without delay:

- *Invigorated political environment*—Several African organizations and programs have taken up increasingly active and visible roles in the continent's development, their role in the present initiative on fertilizer being just one example. These include the follow-up to the 1963-established Organization of African Unity—the *African Union* and its *Commission,* which was established in 1999 and promotes socioeconomic integration and development—and the African Union's main program, *the New Partnership for Africa's Development (NEPAD),* focusing on sustainable development in Africa. Similarly, *the regional economic organizations* of the continent have assumed an active role in the regional economic development by focusing on the reduction of trade barriers and harmonization of regulations, among others reforms.
- *Greater political support for agriculture*—There is a new era of political dynamism in Africa which focuses on agriculture as an engine for growth in the continent. Examples include the impetus of this initiative, the Comprehensive Africa Agriculture Development Program of NEPAD with a goal of an annual agricultural growth rate of 6%, as well as the 2003 Maputo Declaration where African countries have committed to allocating 10% of their budgets to agriculture. Policy changes at the national and regional levels are evident, and contribute to building effective regional and national agricultural markets.

- *Recent policies fostering a strong private sector role in the agricultural sector*—Many African countries are creating the right conditions for their agricultural sectors to flourish as in the past decade; African governments have increasingly recognized the primacy of the private sector in the development of the agricultural sector. Appropriately, these governments see their role as one to create an enabling, yet regulated environment for private sector markets to grow in a transparent and competitive manner.
- *Increased interest in using Africa's indigenous fertilizer resources*—Africa has considerable fertilizer resources but current production capacity in the continent is sub-optimally used, with production declines since 1990. A publication mapping the continent's fertilizer resources will be published in December 2006 by Van Kauwenbergh; a summary of this report will be available at the Summit. Africa has 70% of the world's total phosphate resources and 50% of those resources are currently exploitable by today's market prices (Figure 5). Commercial exploitation has taken place only in the North Africa region, and in South Africa, Togo and Senegal. Direct application of rock phosphate has lately sparked interest particularly in Mali, Burkina Faso, and Kenya and is a possibility in those areas with reactive and high-grade phosphate resources. Outside of the North Africa region and South Africa, nitrogen is produced in Nigeria and Zimbabwe (Figure 6). Recent developments, including the restructuring of the NAFCON plants under new ownership, hold out promise for greater efficiency and output. Potash resources of the continent (Figure 6) are currently not exploited commercially. Currently, the greatest constraint to fertilizer manufacturing in the continent is the region's low demand, but it is expected that once markets develop and manufacturing becomes profitable, the private sector will take interest. African governments and organizations can play an important role in facilitating the manufacturing process by creating conditions conducive for attracting investment in the continent.

Source: IFDC.

Figure 5. Significant Phosphate Rock Deposits of Africa



Source: IFDC.

Figure 6. Significant Potential Nitrogen and Potash Resources of Africa

Promising Elements and Approaches for an African Green Revolution

Fortunately, the recent decade has seen the development and testing of numerous successful models and technologies that can be used as key components of a sound approach for initiating a Green Revolution in Africa. Such components include:

- *Effective agro-dealer network*—Extensive networks of agro-dealers who are knowledgeable about the products they sell and their use are key to the development of dynamic fertilizer markets. Agro-dealers increase fertilizer supply by making it more widely available. The greater fertilizer availability and the information that the dealers can supply to farmers can also increase the farmers' demand. Agro-dealer networks are growing rapidly in some African countries such as Nigeria, Malawi and Ghana.
- *Emerging consensus on how to reach the poorest farmers*—Subsidies have been a hotly contested topic in Africa in the past years. A general consensus seems to be forming from these debates: (1) there is a need to find appropriate mechanisms to increase fertilizer use also among the very poorest who are unable to participate in markets and (2) even these poorest farmers need to be reached through avenues that are market-friendly and thereby also improve the availability of fertilizer in the long run. The diverse experiences with fertilizer subsidies, such as those with Starter Packs in Malawi and the current support given to the fertilizer sector in Nigeria, need to be evaluated and future strategies developed on the basis of the lessons learned in these experiences.
- *Improved access to credit by agro-dealers*—Credit guarantee facilities guarantee loans extended by commercial banks and micro-credit institutions to input dealers. These facilities are being successfully used in Kenya. Credit guarantee facilities provide incentives for extending credit to agribusiness entrepreneurs and thereby improve the flow of inputs into rural areas and promote the development of local financial intermediaries. When principally relying on private sector arrangements and always involving risk-sharing arrangements to ensure credit payments, credit guarantee facilities can have an important role in improving the supply of inputs to rural areas.
- *Availability of new high-yielding, pest- and disease-resistant varieties*—Recent decades have seen the successful development by numerous national and international research organizations of new improved varieties for key African crops, which are high-yielding and resistant to many of the continent's pests and diseases. The New Rice for Africa (NERICA) rice, high-yielding cassava, and pest- and disease-resistant maize can become true building blocks of an African Green Revolution, but only when combined with fertilizer so that their true yield potential can be reached.
- *Technologies enabling high fertilizer use efficiency*—In recent decades, fertilizer use technologies that improve the efficiency of fertilizer nutrients use by some crops have been developed and applied. Techniques such as micro-dosing, modified fertilizer products and ISFM have shown promising results in this regard.
- *Greater effectiveness of output markets*—Better functioning and more developed output markets improve the profitability of agriculture increasing agricultural production and thereby fertilizer use. When farmers know that they can market their produce at proper prices, they will increase production. Successful examples include the development of cashew markets in Mozambique.

Whereas the components outlined above are promising building blocks for a Green Revolution in Africa, increasingly in recent years, there has been a realization that efforts to increase fertilizer use in Africa need to be multifaceted. The demand- and supply-side constraints, reviewed above, should be addressed simultaneously, with strong emphasis placed on improving output markets so that the

profitability of agriculture to farmers can be improved. For this purpose, the following three issues need to be addressed:

- *Access to fertilizer*—Measures to improve the volume, the required diversity, as well as quality of agricultural inputs moving into rural areas using efficient commercial channels to bring them to the doorsteps of the poor farmers.
- *Affordability of fertilizer*—Measures to reduce the price of fertilizer and other complementary inputs in order to bring them within the reach of the rural poor.
- *Incentives for fertilizer use*—Measures to improve agronomic crop production response to fertilizer and to stabilize output prices. President Konaré, the Chairman of the African Union Commission, strongly emphasized the need to improve the profitability of agriculture to Africa's farmers.

Increasingly, such multifaceted efforts to simultaneously address these issues are being implemented throughout the African continent. In the West African context, an example of such multifaceted effort is the Competitive Agricultural Systems and Enterprises (CASE) approach, with coordinated and concurrent work on improving soil fertility and productivity through organic and inorganic fertilizer use, development of output and input markets, and facilitation of policy change.

V. This Initiative

Premises of This Initiative

The present initiative to increase fertilizer use in Africa is a response to the situation reviewed and discussed above. In the remainder of this paper, we describe the planned response, outline its main components and stakeholders, and review plans for the Africa Fertilizer Summit.

As indicated in the Introduction section, during the past year's activities, a common understanding has emerged regarding the current situation and the way forward. Summarizing here again briefly, the scope of this consensus includes:

- *Africa's food security situation is quickly worsening*, and needs to be addressed now.
- *Soil nutrient mining* is an important contributor to poor food security, poor agricultural productivity, deforestation, and loss of wildlife habitats.
- *Agriculture needs to be the priority number one in Africa's development agenda.*
- *Productivity-enhancing inputs, particularly fertilizers, have an indispensable role in achieving agricultural growth in Africa.*
- *Low fertilizer use in Africa is caused by a complex, challenging set of issues.* Future actions must therefore be multifaceted, and all stakeholders will need to participate, with the private sector having a key role in market development.
- *African farmers exhibit a willingness and drive to adapt in the face of many constraints.*
- *Increased fertilizer use in Africa will have positive environmental impacts* by decreasing agricultural pressure on forests, savannahs, and fragile lands.
- *Special arrangements for reaching Africa's poorest farmers,* who lack the resources to purchase fertilizer, will have to be made.

"We therefore have a dream, a vision for our African future. But we also know we have the right approach; agriculture must be the engine for growth in Africa. Most of our people depend on agriculture for their living, and agriculture is the most direct way to improve their well being. Agriculture must be productive and competitive."

—President Obasanjo

The Contribution of This Initiative to the Comprehensive Africa Agriculture Development Program (CAADP) Goals

This initiative of the African Union's NEPAD program is integral to achieving the targets for agricultural growth as set forth by African governments in the CAADP framework. NEPAD sees four dimensions as integral to the development process—human, social, institutional, and economic—and considers agri-

culture as the key sector for achieving economic growth. CAADP was thereafter developed as the main avenue for addressing the limitations in the agricultural sector to decrease food insecurity and foster sustainable agricultural development in the continent. After its finalization, CAADP was endorsed by the African Ministers of Agriculture in 2002 and further, in the Maputo Declaration of 2003 where African leaders committed 10% of their national budgets to the agriculture sector. African countries and the Regional Economic Communities have thereafter endorsed CAADP and are aligning agricultural sector development policies to the CAADP agenda.

The CAADP target of 6% agriculture sector growth rate at the national level by 2015 is envisioned to be achieved through interventions that focus on investments in four pillars. As outlined below, each of these pillars involves the use of modern farm inputs such as fertilizers:

- Pillar 1: Extending the area under sustainable land management and reliable water control systems—this includes interventions to increase soil quality and nutrient content through the increased use of fertilizers.
- Pillar 2: Improving rural infrastructure and trade-related capacities for market access—this includes interventions that focus on building rural markets so that farmers can get access to affordable fertilizer and to output markets to sell their produce.
- Pillar 3: Increasing food supply and reducing hunger—this includes interventions to increase yields through use of fertilizer and other modern technologies.
- Pillar 4: Agricultural research, technology dissemination and adoption—this includes interventions that promote soil testing, updating of fertilizer recommendations, and effective systems for technology dissemination and adoption.

The components and activities of this initiative, as outlined below, therefore clearly contribute to achieving goals that the African countries have set for themselves in the CAADP process. In fact, this initiative is integral to the achievement of these goals.

The Components of the Initiative

This initiative has five main components, with work on the first two already ongoing.

***Component One**: Mobilizing African governments, organizations, and civil society and raising awareness worldwide of the potential of fertilizer in improving the conditions of African smallholder farmers.*

This work was initiated in August 2005 and is ongoing. Representatives of numerous African countries and organizations have been involved in the effort from the beginning. The Country and Regional Strategies articulate plans for increased fertilizer use. Visits to African governments and various international organizations have raised the profile of the fertilizer issue and highlighted the importance of the Summit. A press briefing at the Rockefeller Foundation headquarters on March 30, 2006, was highly successful, with attendance and reporting by many African and international media outlets. The Summit itself will further mobilize the important African actors and solidify the importance of addressing the issue of Africa agricultural development.

***Component Two**: Development of Country and Regional Fertilizer Strategies*

The Country and Regional Fertilizer Strategies are being developed by numerous African countries and all Regional Economic Communities. Their development was initiated in December 2005 and involves a review of the current state of fertilizer demand and supply as well as actions required to improve the fertilizer sector. The strategies will be presented and discussed in the Africa Fertilizer Summit, but their development will be an ongoing process, continuing after the Summit based on the feedback received.

***Component Three**: Development of the Africa Fertilizer Action Plan*

The main output of the Africa Fertilizer Summit is the Africa Fertilizer Action Plan, which will outline the objectives, elements,

and actors for the increase of fertilizer use in the continent, including consideration of the potential of local manufacturing. The Action Plan will encompass realistic goals and exit strategies from development and poverty alleviation programs. Special consideration will be given to the poorest farmers who are unable to participate in fertilizer markets. The government officials, the farmers, the technical experts, and donors will all participate in its development. The Action Plan will then be presented and discussed in the Ministerial Meeting of the Summit, and pursuant to the Summit, the elements of the Action Plan will be further developed.

***Component Four**: Securing human and financial resources to implement the Action Plan*

The objectives of the effort will not be achieved without greater funds for agricultural development. Those funds will need to come from domestic and regional sources in the continent and from international sources. An important start is the African governments' commitment to increase funding for agriculture at the national level. The Summit will be a chance for the governments and donors to work together to achieve an Action Plan that will be mutually acceptable. Securing of funds for this Action Plan is expected to be initiated immediately after the Summit.

***Component Five**: Implementation of the Action Plan and Strategies*

The implementation phase will be initiated quickly after the Summit and it is hoped that the first activities can be initiated during this year. The activities funded will be medium to long term and will be mainly taking place at the national level and within the Regional Economic Communities. Collaboration among the Regional Economic Communities will also form an important component of the activities.

The Stakeholders and Their Roles

The Initiative emphasizes *African ownership* to ensure the correct focus, approach, commitment, and sustainability. The Summit is an effort of the African Union through its NEPAD program. It is chaired by H.E. President Olusegun Obasanjo and hosted by the Federal Republic of Nigeria. The Initiative has mobilized African governments and Regional Economic Communities through their key roles in the preparations toward the Summit (please see below), in the development of Country and Regional Fertilizer Strategies, and participation in advisory committees.

To ensure that the Initiative reflects the true needs in the continent and to ascertain that its implementation will be successful, *stakeholders from all relevant sectors* in fertilizer market development are participating in the Initiative. Particular attention has been given to creating avenues for developing and articulating farmers' views during this process. At the same time, throughout the process there needs to be an acknowledgement of the **distinct roles** that these stakeholders have in the development of Africa's fertilizer sector. Briefly summarized these roles include:

- The farmers: Development of their demand for fertilizer and other improved technologies should be the target because it is the driving force of the fertilizer sector development.
- The private sector: For an efficient and lasting solution to fertilizer manufacture, supply, and distribution, the private sector needs to be allowed to take the lead.
- The African governments: Enabling environment for increased supply and demand is crucial and the governments should have a key role in it. The enabling environment includes appropriate macro- and micro-policies, institutions, and infrastructure. Regulation of fertilizer quality and its sound environmental use will be a key factor.
- The development partners: Donors and development organizations will need to work with African governments and organizations in financing and supporting the future initiatives in ways that do not distort the role of the private sector.
- The civil society: The civil society is a key partner to ensure correct focus, accountability, and as a bridge to fostering

public-private partnerships needed to bring about increased fertilizer use on the continent.

Africa Fertilizer Summit: Objectives and Format

The Africa Fertilizer Summit will bring together African heads of state, ministers, presidents and heads of international donor organizations, private-sector firms, farmers' organizations and senior policymakers**.** Its broad objective is to *improve access of millions of poor African farmers to fertilizer and other complementary inputs, in order to help them raise their farm production and achieve food security*. More specific objectives include to:

- Affirm the critical importance of fertilizer in contributing to rapid and sustainable pro-poor agricultural productivity growth in Africa.
- Review the evidence on fertilizer use in African agriculture and identify the primary policy, institutional, financing, and infrastructural and market constraints that limit the access of fertilizers by poor farmers, including perspectives from farmers themselves.
- Assess innovative approaches that have been used to build rural input market infrastructure to supply agricultural inputs to the rural poor.
- Agree on a strategy for developing an African Fertilizer Action Plan to accelerate the access of millions of poor farmers to chemical fertilizers and other complementary inputs. This action plan will include a realistic time line to reverse food insecurity and the poverty trap, as well as realistic goals and exit strategies from development and poverty alleviation programs.

"The end result—our harvest—will be the pragmatic activities and actions that emerge at the end of the Summit—that will be carried back to each country, implemented there, and across national boundaries.
We come together today with determination and the expectation that—through our combined energy and effort—we can and will make a difference in the lives of millions."

—Dr. Judith Rodin, President, the Rockefeller Foundation, Eminent Persons' Advisory Group, New York, March 30, 2006

The Summit will consist of Technical, Ministerial, and Heads of State sessions. The Technical Session, to be held June 9-10, will emphasize breakout and panel sessions focusing on generating detailed actions needed. The Ministerial Session, to be held June 12, will discuss these actions and will submit its conclusion for the deliberation of the Heads of State on June 13. The program of the Summit is presented on this page.

The Summit is about action, not about talk. The horrendous human toll of underdevelopment in Africa is a constant reminder to ensure that the Africa Fertilizer Summit will not be another "talk shop." Instead, its initiators, organizers, and implementers are determined to ensure that it will result in the development and completion of bold actionable programs that will make fertilizer available to millions of farmers in a timely manner and at an affordable price.

VI. Our Responsibility

As government officials, politicians, private sector and donor representatives, and diverse technical experts, we all come to Abuja with our knowledge and experiences. We come there out of a sense of duty to help those whom development has passed and who still continue to live their life in poverty at the dawn of the 21st century. We come to the Summit armed not only with our own personal accumulated knowledge and experience but also with numerous reports and papers prepared for the Summit by the African governments and regional organizations, as well as by many of the world's experts in the issues of fertilizer use in Africa. We also come to Abuja following the leadership of committed world leaders who have decided to take this Initiative to completion.

In the 2 days of the Technical Session, the various approaches to fertilizer sector development will be discussed and debated, with their varying benefits and limitations presented. At the end

there will be a time to set aside the differences to achieve our objective: formulation of strategies and actions that will improve agricultural production in Africa through increased use of fertilizer. These strategies and actions will then be presented for the deliberation of the Ministerial Session and thereafter, the Heads of State.

The achievement of this target will be only the first step in the effort to revitalize Africa's agriculture. Immediately after the Summit, the diverse participants will need to further develop these strategies into actionable programs that can be started within months, not years, of the Summit. It is only when the positive impact of these programs can be felt by the continent's farmers—whether a maize farmer in southern Benin reaping a half ton of maize from his degraded soils or a Ugandan farmer struggling to keep up his yield of banana—that we have started to achieve our goals. Until then, we need to keep working and remind ourselves that achieving "a prosperous and peaceful Africa" is not only in all of our interests, but it is also our responsibility.

"This is the hour for Africa. Let's take this bold step together and expand food security and income opportunities across Africa. I look forward to welcoming you to the Summit in Abuja. Thank you for your support."

—President Obasanjo