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Increased Fertilizer Use Opportunities And Challenges For Food Security In Sub-Saharan Africa

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INCREASED FERTILIZER USE OPPORTUNITIES AND CHALLENGES FOR FOOD SECURITY IN SUB-SAHARAN AFRICA

Introduction

The Organization for African Unity adopted "A New African Initiative" in Lusaka, Zambia, in July 2001 and launched the "New Partnership for Africa's Development" (NEPAD) in October 2001. The NEPAD aims to promote economic recovery and development in Africa over the next 15 years. In July 2006 the African Union convened a Fertilizer Summit in Abuja-Nigeria. A salient feature of the Summit was the body politic declaring fertilizers a strategic commodity. This note on the fertilizer situation in Africa focuses on projected needs and optimal modalities for addressing food security issues.

There is an apparent contradiction between the imperative of increasing agricultural production and the stagnant effective demand for fertilizers. The aim of the NEPAD–CAADP for agriculture is that by 2015 Africa should:

- have attained food security (in terms of availability and affordability and of ensuring access for the poor to adequate food and nutrition);
- have improved productivity to an average annual growth rate of 6 per cent, with particular attention to small-scale farmers, especially women;
- have established dynamic national and regional agricultural markets;
- have integrated farmers into the market economy (including improved access to markets), with Africa to become a net exporter of agricultural products;
- have achieved a more equitable distribution of wealth;
- have become a strategic player in agricultural science and technology development;
- be practising environmentally sound production methods and have a culture of sustainable management of the natural resource base (including biological resources for food and agriculture).

African agriculture

The NEPAD–CAADP aims to increase food availability for the expanding population. This entails a "make or buy" decision, i.e. produce or import more. Given the macroeconomic and social goals, limited financial resources and a comparative advantage in agriculture, the NEPAD–CAADP opts to "make more". Thus, in order to achieve the World Food Summit (WFS) goal of reducing the number of malnourished people by at least 50 per cent by 2015, domestic production must increase. Table 1 provides an indication of the effort required to increase production, with 25 countries needing to produce 20–70 per cent more food by 2015, and 20 countries 60–160 per cent.

About 874 million ha of Africa's land is considered suitable for agricultural production. Of this area, about 83 per cent has serious soil fertility or other limitations and will need costly improvements and amendments to achieve high and sustained productivity. Nutrient depletion is common in Africa and represents a significant loss of natural capital (estimated at US $1–3 billion/year). The nearly 70 million smallholder families in sub-Saharan Africa (SSA) need to adopt sustainable integrated soil fertility and land and water management practices on their farms to a large extent within the next decade.

The improvement and maintenance of soil fertility is a prerequisite for sustained increases in crop yields. Without adequate levels of soil fertility, crops cannot respond to other inputs such

as new seeds and management practices. Most soils must receive sufficient levels of nutrients as organic and mineral fertilizers. The optimal mix between the two depends on their availability and water supplies. Mineral fertilizers supply about 44 per cent of the nutrients used by crops. More efficient use of fertilizer, e.g. through improved timing, split applications, site-specific management, crop rotation, and soil testing, can facilitate higher yields with the same or even less fertilizer.

Protecting and improving the soil is sound business sense. Research in one country has shown that on relatively good soils initial nutrient recovery was only about 30 per cent, but that after 4–7 years of soil improvement, nutrient use efficiency increased considerably. The capture of nutrients is only about 35 per cent for nitrogen (N) and 15 per cent for phosphorus (P) without soil improvement (about half of rates typical elsewhere). This is particularly important in Africa where twice as many nutrients are lost compared with other regions. Thus, where farmers do not maintain soil fertility, nutrient losses from fertilizer application rise and fertilizer use becomes unprofitable.

Apart from inefficient uptake of nutrients, the total input of fertilizers is very low. Fertilizer consumption in Africa increased by 1 per cent/year in the 1990s, with annual growth rates of 3 per cent in Egypt and Morocco, zero growth in SSA and a decline of 1 per cent in South Africa. Table 2 enables a comparison of fertilizer application rates, e.g. farmers in East Asia apply almost seven times more fertilizers than do their African counterparts.

Developed countries appear to exhibit growing nutrient use efficiency, especially for N. While African farmers produce 7 kg of maize per kilogram of N fertilizer nutrients, farmers in North America produce five times as much with the same application (also using better seeds and a different production technology). Such productivity differences constitute a major constraint for African agriculture in an increasingly competitive global market.

The most appropriate strategy for most African countries is one of agricultural output growth through intensification rather than land expansion into fragile and high-risk environments. Therefore, achieving sustained increases in crop yields will become even more critical.

Fertilizers and food production

The role of mineral fertilizer in support of a growing demand for agricultural commodities is well established. The past 30 years show a positive correlation between cereal production and fertilizer use in developing countries, which currently use the bulk of mineral fertilizers and exhibit a faster growth relative to developed countries. However, African production systems can differ significantly from systems elsewhere. They often consist of a mix of crops grown simultaneously in order to optimize use of the most scarce production factor, i.e. labour. In the past, the relatively ample availability of land and low population size resulted in farmers maximizing production per labour unit, rather extensive production systems per unit of land, and ensuing low input use.

The CAADP envisages agriculture growth from higher yields through increased intensified crop production. As production technology improves, farmers will need to sustain higher yields by higher fertilizer application, in particular in irrigated production systems, a CAADP focus (Table 3). To reach the production goals, yields will need to increase by significantly more than 1 per cent/year for most crops, especially traditional staples. Farmers will need to achieve higher yields under rainfed conditions when the expansion of irrigated agriculture deviates from CAADP goals on land and water development. In order to support crop yields in achieving the goals established by the NEPAD and articulated in the CAADP, fertilizer use in Africa needs to increase by about 50 per cent by 2015 (Table 4). The estimated Africa requirements in 2015 of N, P_2O_5 and K_2O fertilizer nutrients are 2.7 million, 1.1 million and

0.6 million tonnes, respectively. Fertilizer application in SSA would need to increase from an estimated 9 kg fertilizer nutrient/ha in 2000 to 23 kg/ha in 2015. Such increased fertilizer use would narrows the gap with Asian farmers by more than 100 per cent in a short period. This growth implies a significant increase in crop production intensification. The related effective demand for this volume of fertilizers will depend in particular on continuously increasing fertilizer use profitability through higher commodity prices received by farmers.

Farmer adoption of good land husbandry is a condition for profitable fertilizer use. Twenty-two African countries are assessing the importance of soil fertility and soil degradation to people's livelihoods in order to establish the extent to which food security, especially for the most vulnerable members of society, depends on soil fertility. However, soil fertility is just one factor in food security, and its importance is modified by various social, economic and institutional factors. Consequently, soil fertility management strategies are highly diverse and change over time, and remedial measures must suit local conditions. There is a strong case for a new, participatory approach to agricultural extension and research. The addressing of soil fertility issues through national special programmes for food security (Nigeria) and special commodity-based development initiatives (Ghana) is distinctly cost advantageous. An approximate cost estimate for such soil fertility development is US $2–4 million over five years, involving 6,000 farmers per country.

Supply factors affecting fertilizer use

Infrastructure development is of vital importance for fertilizer availability. Internal transport costs are high in African countries. For example, they increase fertilizer-marketing costs by 33 per cent in Ethiopia. For each tonne of fertilizer applied, at least 5–10 tonnes of produce have to move to markets (and ports). Many problems can arise when importing, storing, transporting and distributing a bulky input that is sensitive to heat and humidity. An adequate fertilizer supply at farm level is essential for maintaining reasonable fertilizer costs, even where domestic prices reflect real cost. Improved marketing systems, particularly through private marketing and better infrastructure, will reduce farmgate prices of fertilizers regardless of their origin. Rural-market development projects (3–5 years) for downstream distribution of inputs involving about 500 dealers per country would cost about US $18 million/year in 24 countries.

Landlocked countries may also be more vulnerable to supply disruptions and price instability. For example, while urea fertilizer was US $600/tonne in 1999 in Uganda, the international price was about US $200/tonne. Existing subregional economic cooperation institutions need to address improvements in marketing and transport infrastructure in neighbouring countries and informal fertilizer exports from low-cost to high-cost countries as subregional integration progresses (a NEPAD priority). The estimated per country cost of establishing national access to regional fertilizer market and trade information systems is US $50,000. A further US $20,000 per country per year would cover the costs of data collection and processing in order to maintain the systems.

The privatization of fertilizer distribution has often been unsuccessful. The private sector has rarely had an active role in the planning of changes to agricultural services. This situation needs rectifying through increased consultation with trade associations and chambers of commerce. While many countries have liberalized fertilizer markets, support for their efficient development has lagged. Following the abolition of state-run input delivery systems, the private sector has not made a major move into the fertilizer business, as there is little commercial incentive to deliver small quantities to remote villages over poor roads. Public-

sector support is imperative in the first stage of market development. A smooth transition to private-sector distribution becomes feasible as general economic development progresses.

Foreign exchange availability is relevant in SSA countries that employ foreign exchange controls. Fertilizer import costs were about US $201 million in 2000, with an average price of about US $170/tonne. To attain the derived fertilizer growth, the amount spent on fertilizer needs to increase by about 3 per cent/year to US $351 million in 2015 at current prices. Despite such increases, fertilizer costs would remain a small fraction of the total imports of the region. In 2000, SSA spent US $360 million on maize and rice imports alone. To ensure fertilizer availability, governments should focus on providing public goods in the form of infrastructure, roads and distribution facilities in the early stages of fertilizer market development.

The financing of fertilizer trade operations varies considerably between countries and relates to the strength of financial institutions and the size of the national markets. Access to adequate finance from the formal banking sector can do more to promote competition and lower costs than can fiscal concessions, which may change overnight. For example, with a revolving trade credit fund financing 50 per cent of the fertilizer procurement and primary distribution costs, the credit products required could total US $100–175 million.

Demand factors affecting fertilizer use

Fertilizer demand at the smallholder level in Africa is complex. Price is a critical variable in fertilizer demand and supply. Research data show the primary factor in changes in fertilizer demand is profitability of use. Research in Africa also highlights the importance of improving farmers' crop prices in stimulating fertilizer use and higher yields per hectare. It is significant that changes in crop prices have a greater impact than changes in the cost of fertilizers. Fertilizer demand research shows that a one-per cent crop price change will be at least 25 per cent more effective than a one-per cent change in the cost of fertilizer.

Price stability, farmers' incomes and high fertilizer prices relative to output market prices are significant determinants of effective demand. Poor smallholders' access (physical and financial) is an essential factor, particularly where fertilizer-marketing systems are fragmented and underdeveloped. An important component in building demand is to improve farmers' knowledge on fertilizer products and application. While cash crops sometimes receive fertilizer applications, food crops hardly ever do. However, in general, the long-term cash-crop price outlook is one of decline.

Markets in Africa are open to private-sector participation. Thus, fertilizer prices reflect the influence of import and domestic marketing costs, including distribution to rural areas, and the cost of capital to finance supplies. Prices also reflect the significant business risks facing fertilizer importers and dealers as they seek to develop domestic demand. SSA imports most of the fertilizers it uses (Table 5). Their prices depend on international demand and supply. Other cost reductions relating to logistics and financing trade operations depend on the general status of economic development.

The ability to lower fertilizer costs varies from country to country in Africa. Improved procurement and marketing practices can reduce transaction costs, which may result in lower prices (depending on the intensity of competition in markets). Compound fertilizers account for most of the fertilizer used in SSA. Such fertilizers provide a balanced supply of plant nutrients. However, their lower nutrient content means that the cost per unit of nutrient may be relatively higher compared with using equally suitable straight grades. Improvements in the supply of cost-effective products will have a favourable impact on fertilizer demand.

Non-price factors, such as inadequate supply, untimely local availability, and the lack of credit, also constrain fertilizer demand. However, they do so to a lesser extent than low commodity prices and high fertilizer prices in some countries. Considerable evidence suggests that physical availability has been a major constraint on fertilizer use in SSA. Studies in Ethiopia and Zimbabwe have shown that distance to roads, distance to fertilizer retail outlet, and availability at planting time are significant factors in determining fertilizer demand. Any fertilizer strategy for SSA should aim to increase fertilizer use profitability. Attractive produce prices for farmers and lower fertilizer costs, in conjunction with ample fertilizer availability, would stimulate demand. Problems such as quantity rationing and rent-seeking behaviour by merchants are as much a problem of inadequate supplies as of subsidized prices. If supplies were sufficient, there would be no quantity rationing or room for rent-seeking behaviour.

Selected initiatives to expand fertilizer use in Africa

The African Centre for Fertilizer Development (ACFD) has developed an integrated farming system to achieve multiple goals, such as improvement in crop yields, balanced diet, cash incomes, soil and water conservation, and soil fertility. Time and labour saving have also become important objectives in view of the adverse impact of reduced labour availability in the region. This farming system combines three practices: proper and timely input use (organic and mineral fertilizers, liming, seed and agrochemicals); adoption of conservation tillage; and diversified intercropping systems and agroforestry. The system has improved maize yields from 1–5 tonnes/ha to 2.7–9.3 tonnes/ha and produced 0.5 tonnes/ha of grain from leguminous intercrops, for a return on invested working capital of more than 100 per cent/year. In addition, farmers can make considerable savings on labour for weeding. The diversified cropping system allows farmers to harvest a product for sale every three months, so supporting farm-household cash flow.

The International Fertilizer Development Center (IFDC) with its focus on soil fertility improvement and agricultural development has developed a package of inputs and practices called integrated soil fertility management (ISFM). ISFM raises productivity while maintaining the natural resource base. The package includes the combined use of soil amendments, organic materials and mineral fertilizers to replenish plant nutrients in the soil and to improve the efficiency and cost-effectiveness of external inputs. The technology package produces yields that are 2–3 times higher than national yields. The return on capital invested exceeds 100 per cent, with a value–cost ratio well above 2, and returns to family labour are 2–6 times higher than the average salary in SSA. The ISFM project operates in Benin, Burkina Faso, Ghana, Mali, Niger, Nigeria and Togo with more than 2,000 farmers in 100 villages participating. The emphasis is on participatory approaches to developing ISFM options suitable to local agro-ecological and socio-economic conditions. Farmers select, experiment and adapt the methods in their own fields. This freedom of choice and action enables them to innovate.

The search for a market friendly approach for the distribution of subsidized fertilizers led the Government of Nigeria to support the implementation of a fertilizer sales voucher system. Fertilizers were sold at subsidized prices to farmers in selected sites of the FAO supported Nigeria Special Programme for Food Security. Each participating farmer was issued a voucher for the amount of fertilizer allocated to him. With the voucher, the farmer went to the dealer to purchase fertilizer at the subsidized price, endorsing the voucher to certify that he had paid for and collected the allocated fertilizer. The dealers and farmers financed their transactions from their own resources. None benefited from a loan from any Bank. In some cases, the farmers paid to the dealers in advance for their allocations. In other cases, the

dealers paid with contributions from the Apex Societies. In such cases the dealers were thus being funded by the farmers or the farmers' societies. Farmers expressed satisfaction with the voucher system and would want it to continue. Some reasons given for their satisfaction included that fertilizer was cheaper; fertilizer was easier to get; fertilizer was brought nearer to their farms. The dealers expressed satisfaction with the voucher system. They would also like to continue participation in the system. The advantages from the system included the ease with which they could procure supplies, the better security provided by the method of stock deliveries and the ready market for the supplied fertilizer.

The Southern African Development Community (SADC) – ACFD 2002 regional consultation on "Improving fertilizer procurement and distribution to enhance food crop production in the SADC region" aimed to reverse the persistent decline in per-capita food production. Smallholders do not apply fertilizers at the recommended rates or at the appropriate time. The high farmgate cost of fertilizer and its unavailability at peak demand periods are the major reasons why this sector has a low fertilizer use adoption rate (25 per cent). A regional approach is to:

- support the establishment of consortia for bulk buying and transportation;
- promote research and development to produce suitable high-analysis fertilizers;
- foster joint ventures to establish fertilizer manufacturing plants;
- support strategic partnerships between stakeholders in order to enhance capacity building and interregional trade;
- promote investment in fertilizer stocks.

Conclusion

Increased crop production through expanded fertilizer use will benefit farmers' income and food security. The development of local fertilizer markets will build on enhanced private-sector capacity and improved rural markets to enable better access to and affordability of fertilizers.

The fertilizer development programme should have the following elements:

- implementation and expansion of national soil fertility action plans for improved land husbandry in order to achieve higher fertilizer productivity;
- establishment of national access to existing regional fertilizer market and trade information systems (through existing subregional economic cooperation agreements);
- improved efficiency in procurement and development of rural markets for downstream distribution of inputs in collaboration with commodity traders within the framework of ongoing national special programmes for food security;
- assessment of expanded fertilizer manufacturing capacity in conjunction with implementation of the above;
- establishment of farmers' groups and revolving funds for input procurement.

Mineral fertilizers cannot solve all Africa's agricultural problems. However, without their expanded use, the future may be one of cycles of low productivity, food insecurity, rising food import bills and low farm incomes.

TABLE 1
Increment output requirement in 2015 (base 1997–99)

Country	Increment output requirement (%)	Country	Increment output requirement (%)
Mauritius	23	Guinea	67
Namibia	41	Gambia	74
Côte d'Ivoire	41	Senegal	75
Tunisia	41	Mali	75
Swaziland	44	Chad	78
Ghana	46	Ethiopia	81
Malawi	47	Mauritania	83
Nigeria	49	United Republic of Tanzania	85
Zimbabwe	50	Burkina Faso	85
Egypt	50	Madagascar	87
Botswana	51	Uganda	89
Guinea Bissau	51	Sierra Leone	94
Morocco	52	Eritrea	97
Lesotho	53	Rwanda	98
Gabon	53	Burundi	109
Benin	56	Zambia	109
Cameroon	56	Congo	111
Mozambique	56	Angola	120
Central African Republic	57	Niger	127
Kenya	58	Somalia	128
Algeria	58	Democratic Republic of the Congo	137
Libyan Arab Jamahiriya	64	Liberia	156
Sudan	64	**Sub-Saharan Africa**	**66**
Togo	65	**Africa**	**63**

Source: Based on FAO Support to "The New Partnership for Africa's Development": Land and Water Resources Issues and Agricultural Development.

TABLE 2
Average fertilizer application rates

	1980/81	1990/91	2000/01
		(nutrients in kg/ha)	
World	88	100	100
Developed countries	120	112	80
Economies in transition	104	104	29
Developing countries	57	88	116
Latin America and the Caribbean	64	63	99
East & South East Asia	63	108	149
South Asia	37	77	109
Sub-Saharan Africa	**8**	**10**	**9**
Africa	**20**	**22**	**22**
Oceania	35	30	63

Source: FAOSTAT.

TABLE 3
Yields in Africa

Crop	Rainfed yield		Yield	Irrigated yield		Yield
	1997/99	2015	increment	1997/99	2015	increment
	(tonnes/ha)		(%)	(tonnes/ha)		(%)
Wheat	1.1	1.3	26	4.2	5.1	24
Rice	1.4	1.8	29	4.3	5.1	20
Maize	1.4	1.7	24	5.7	6.2	8
Barley	0.8	1.1	30	2.1	2.6	22
Millet	0.7	0.9	33	1.9	2.7	41
Sorghum	0.8	1.0	28	2.4	3.0	24
Potato	8.8	10.4	18	17.8	20.9	18
Sweet potato	7.9	9.4	19	18.7	22.9	22
Cassava	8.5	10.1	18	-	-	-
Other roots	5.7	6.4	12	-	-	-
Plantain	5.7	7.0	23	-	-	-
Beet	50.5	52.2	3	49.7	57.3	15
Cane	42.8	47.0	10	88.5	97.0	10
Pulses	0.4	0.7	48	2.5	3.0	20
Vegetables	6.1	7.6	23	15.7	17.7	13
Banana	6.5	8.8	35	33.5	34.6	3
Citrus	6.0	8.5	41	14.6	17.2	18
Fruits	7.0	8.6	22	13.5	15.4	14
Oil crops	0.9	1.1	18	3.3	4.2	25
Rape	0.6	0.6	14	-	-	-
Oil-palm	0.6	0.9	55	-	-	-
Soybean	0.9	1.2	31	2.9	3.0	5
Groundnut	0.8	1.0	26	1.3	1.8	39
Sunflower	1.0	1.3	38	2.4	2.6	11
Sesame	0.3	0.4	66	1.2	1.4	22
Coconut	2.8	3.1	13	3.0	4.9	63
Cocoa	0.4	0.5	23	-	-	-
Coffee	0.3	0.4	22	0.7	0.8	13
Teas	1.5	1.6	9	2.7	2.9	8
Tobacco	1.2	1.2	0	1.0	1.1	18
Cotton	0.8	1.0	22	1.8	2.0	9

Source: Based on FAO Support to “The New Partnership for Africa's Development”: Land and Water Resources Issues and Agricultural Development.

TABLE 4
Actual and projected fertilizer consumption

	1997-99	2015	N	P_2O_5	K_2O	Increment
			(tonnes nutrients)			(%)
Algeria	116,933	128,355	66,924	14,771	46,661	10
Mauritius	33,186	39,896	14,584	8,038	17,273	20
Benin	44,458	58,389	30,455	15,245	12,689	31
Tunisia	91,174	120,767	60,943	54,058	5,765	32
Togo	16,970	22,650	9,496	6,318	6,835	33
Malawi	50,767	69,105	45,564	18,282	5,259	36
Morocco	325,874	447,377	233,812	138,162	75,403	37
Libyan Arab Jamahiriya	82,000	112,915	40,208	64,770	7,937	38
Egypt	1,145,840	1,580,102	1,335,427	195,339	49,336	38
Burkina Faso	47,870	66,912	22,985	31,101	12,825	40
Sudan	78,667	114,998	81,030	33,969	0	46
Rwanda	67	99	99	0	0	48
Zimbabwe	174,919	261,565	127,589	52,757	81,219	50
Nigeria	171,433	256,646	161,401	42,753	52,492	50
Botswana	2,942	4,420	4,134	174	112	50
Cameroon	32,667	49,567	24,033	7,964	17,570	52
Ghana	12,667	19,471	7,066	6,368	6,037	54
Gambia	850	1,318	352	636	329	55
Mozambique	10,333	16,120	9,319	1,658	5,143	56
Gabon	400	630	141	159	330	58
Swaziland	6,119	9,668	2,011	2,709	4,948	58
Guinea Bissau	1,367	2,207	141	637	1,428	61
Chad	9,683	15,843	6,036	3,386	6,421	64
Senegal	25,933	42,521	12,176	19,913	10,432	64
Lesotho	5,548	9,254	2,945	3,250	3,059	67
Côte d'Ivoire	88,567	148,178	85,514	35,738	26,926	67
Kenya	138,233	234,031	83,316	130,685	20,031	69
Central African Republic	1,200	2,032	1,653	186	193	69
Mali	30,833	53,101	18,970	16,326	17,805	72
Congo	2,667	4,629	2,724	0	1,904	74
Niger	10,660	19,082	10,813	4,191	4,078	79
Sierra Leone	3,000	5,381	1,635	1,842	1,905	79
Somalia	333	616	616	0	0	85
Eritrea	3,769	7,099	5,112	1,987	0	88
Uganda	3,233	6,108	3,570	804	1,733	89
Zambia	48,867	93,637	47,360	25,973	20,304	92
Madagascar	7,561	14,629	6,766	4,208	3,655	93
United Republic of Tanzania	30,617	59,346	35,419	11,952	11,976	94
Guinea	2,760	5,496	1,852	2,265	1,378	99
Mauritania	574	1,169	1,080	44	44	104
Burundi	5,667	11,761	1,860	6,288	3,613	108
Ethiopia	154,574	321,419	131,595	177,585	12,239	108
Angola	2,933	9,983	5,972	2,048	1,963	240
Sub-Saharan Africa[x]	**1,262,892**	**2,058,976**	**1,007,386**	**677,441**	**374,149**	**63**
Africa[xx]	**3,024,714,**	**4,448,493**	**2,744,701**	**1,144,541**	**559,251**	**47**

[x] Excluding Namibia and Liberia.
[xx] Excluding South Africa where fertilizer consumption is projected to decline.

Source: Based on FAO Support to "The New Partnership for Africa's Development": Land and Water Resources Issues and Agricultural Development.

TABLE 5
Fertilizer trade in Africa, 2000

Products	Region	Imports	Exports	Net Trade	Exporting regions: Europe	E. Europe & Central Asia	W. Asia	N. America	Other
		(thousand tonnes nutrients)			(thousand tonnes nutrients)				
DAP	South Africa	20	25	5	-	10	-	10	-
	North Africa		1050	1050	-	-	-	-	-
	Other Africa	120	0	-120	-	-	25	80	-
	Africa	140	1075	935	-	10	25	90	15
MAP	South Africa	10	25	15	-	10	-	-	-
	North Africa		175	175	-	-	-	-	-
	Other Africa	25	0	-25	-	-	-	15	10
	Africa	35	200	165	-	10	-	15	10
Potash	South Africa	155	0	-155	50	35	70	-	-
	North Africa	20	0	-20	10	10	-	-	-
	Other Africa	125	0	-125	20	90	15	-	-
	Africa	300	0	-300	80	135	85	-	-
Urea	South Africa	235	0	-235	15	35	175	-	10
	North Africa	130	0	-130	5	105	-	-	20
	Other Africa	210	0	-210	30	55	100	-	25
	Africa	575	0	-575	50	195	275	-	55
Ammonium	South Africa	-	10	10	-	-	-	-	-
nitrate	North Africa	30	25	-5	10	20	-	-	-
	Other Africa	20	0	-20	20	-	-	-	-
	Africa	50	35	-15	30	20	-	-	-
							(%)		
Total	South Africa				14	23	54	4	2
	North Africa				14	75	0	0	11
	Other Africa				11	22	28	29	7
	Africa				13	30	33	16	8

Source: IFA Production and International Trade Committee, October 2003.