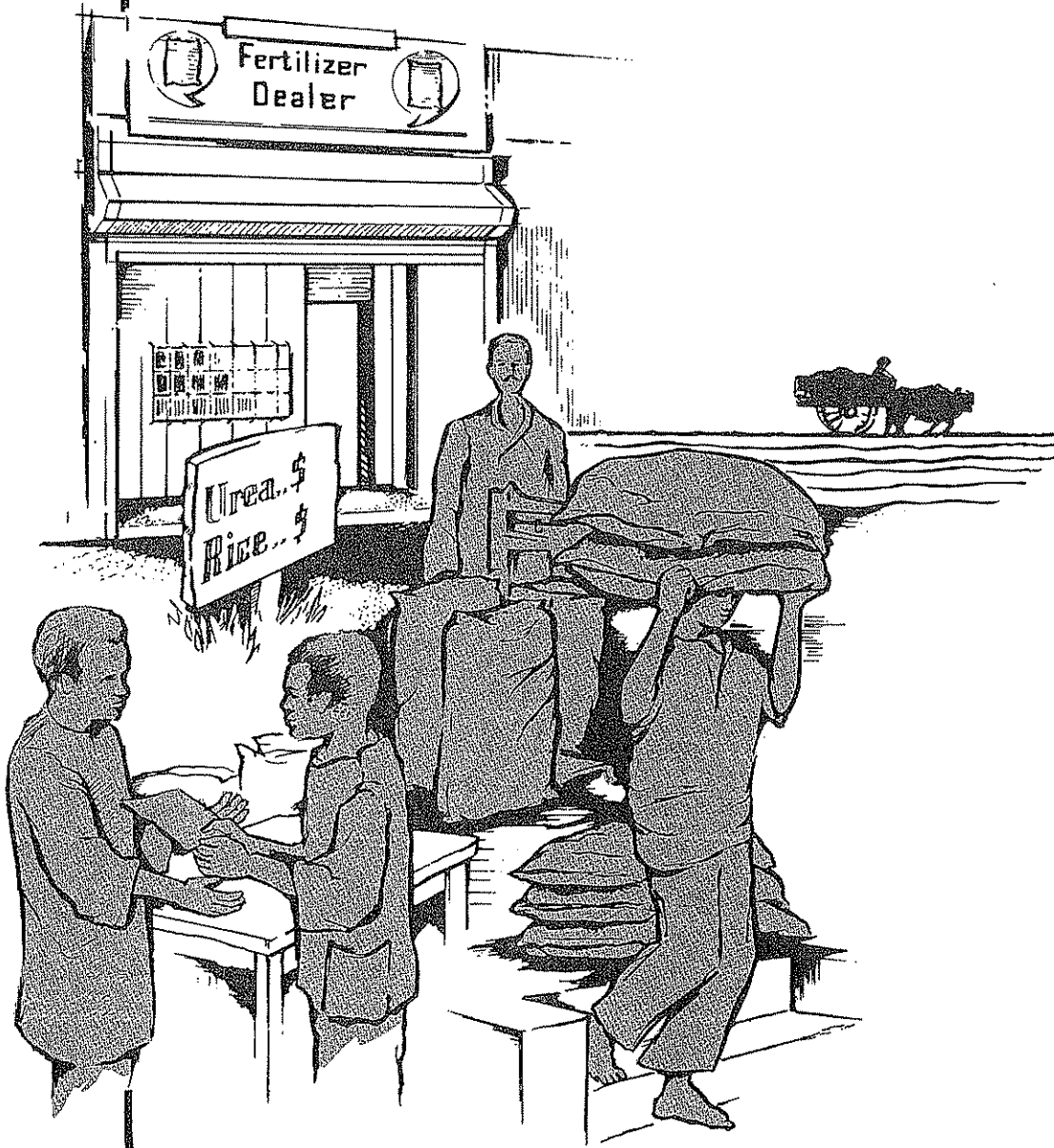


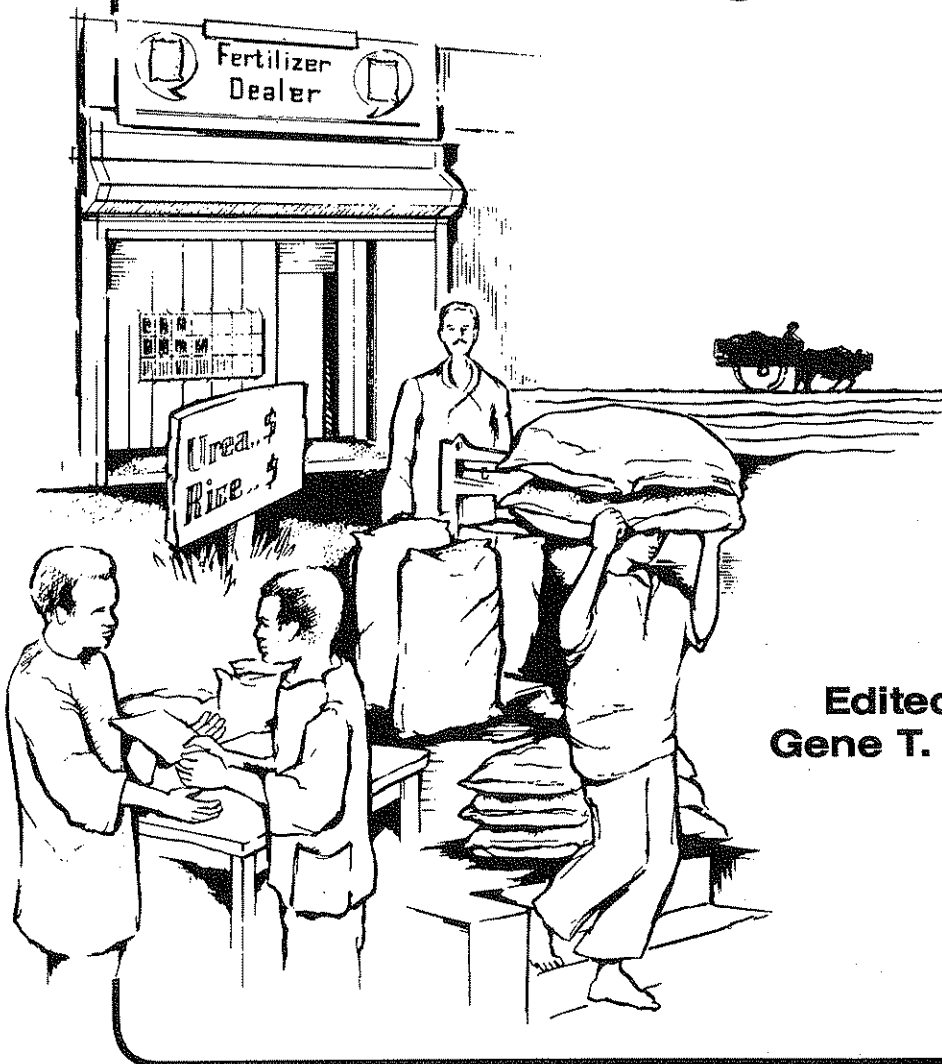
# Fertilizer Subsidies in Developing Countries



**International Fertilizer Development Center**



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Edited by  
Gene T. Harris

**International Fertilizer Development Center**

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## Preface

Fertilizer subsidies in recent years have received considerable attention from government policymakers. The importance of fertilizer subsidies is illustrated by the large number of countries that either have dropped their present fertilizer subsidies, have reduced them, or have adopted a new subsidy policy. As fertilizer consumption and the cost of fertilizer have increased, the cost of maintaining subsidies has become very high. Foreign exchange shortages, the overall world economic situation, and large debts faced by many countries coupled with these large expenditures on fertilizer subsidies are causing many countries to examine carefully their subsidy policies. The International Fertilizer Development Center (IFDC) felt it would be helpful to policymakers if we could examine and summarize the experiences that various countries have had with subsidies. We have selected a variety of countries—some small, some large—many of whom have established subsidies for different reasons.

Short papers describing the current status of subsidies as of mid-1984 are presented for 17 developing countries including Argentina, Burkina Faso (formerly Upper Volta), Chile, Colombia, Gambia, India, Indonesia, Ivory Coast, Nepal, Philippines, Saudi Arabia, Sierra Leone, Sri Lanka, Turkey, Venezuela, Zambia, and Zimbabwe. We have included several countries that currently have subsidies; other countries such as the Philippines, Saudi Arabia, and Chile that have removed the subsidy; and Venezuela that removed the subsidy and has now reinstated it. Zimbabwe is included as an example of how emphasis on markets for crops has replaced the need for subsidies. Chile uses minimum crop prices to offset the need for a subsidy. Many countries such as Burkina Faso, Gambia, Sierra Leone, and Zambia have plans to phase out subsidies in the future. Sierra Leone has already removed the fertilizer subsidy for commercial farmers.

The papers were written by people who reside in the country about which they are writing and who are actively involved in its fertilizer sector. IFDC is very grateful to the 26 authors or coauthors for providing excellent and timely papers on a very important subject.

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## List of Abbreviations

### Currencies

Bs.....	Bolivar (Venezuela)
Col \$.....	Dollar (Colombia)
FCFA.....	African Financial Community franc (Burkina Faso, Ivory Coast)
K.....	Kwacha (Zambia)
Le.....	Leone (Sierra Leone)
NRs.....	Rupee (Nepal)
P.....	Peso (Philippines)
Rp.....	Rupiah (Indonesia)
Rs.....	Rupee (India, Sri Lanka)
SR.....	Riyal (Saudi Arabia)
TL.....	Lire (Turkey)
US \$.....	Dollar (United States)
Z \$.....	Dollar (Zimbabwe)

### Fertilizers

AN.....	Ammonium nitrate
AS.....	Ammonium sulfate
B <sub>2</sub> O <sub>3</sub> .....	Boron oxide
CAN.....	Calcium ammonium nitrate
CaSO <sub>4</sub> .....	Calcium sulfate
DAP.....	Diammonium phosphate
DSP.....	Double superphosphate
H <sub>2</sub> SO <sub>4</sub> .....	Sulfuric acid
K.....	Potassium
K <sub>2</sub> O.....	Potassium, expressed as potassium oxide
KCl.....	Potassium chloride
LPR.....	Locally ground phosphate rock
MgO.....	Magnesium oxide
MOP.....	Muriate of potash
N.....	Nitrogen
NPK.....	Compound fertilizer containing three primary nutrients, N, P <sub>2</sub> O <sub>5</sub> , and K <sub>2</sub> O
P.....	Phosphorus
P <sub>2</sub> O <sub>5</sub> .....	Phosphate, expressed as phosphorus pentoxide
PR.....	Phosphate rock
SN.....	Sodium nitrate
SOP.....	Potassium sulfate
SSP.....	Single superphosphate
TSP.....	Triple superphosphate

### Measurements

ha.....	hectare (2.47 acres)
kg.....	kilogram (1 pound = 0.454 kg)
mm.....	millimeter
mt.....	metric ton—tonne (2,204 pounds = 1,000 kg)
mtpy.....	metric ton per year
%.....	percent

## Miscellaneous

B:C.....	benefit:cost ratio
BIMAS.....	Bimbingan Massal Swa Sembada Bahan Makanan
c.i.f.....	cost, insurance, freight
FCO.....	Fertiliser Control Order
f.o.b.....	free on board
f.o.t.....	free on truck
GDP.....	gross domestic product
IADP.....	Integrated Agricultural Development Project
INMAS.....	Intensifikasi Massal
INSUS.....	Intensifikas Khusus
ISD.....	inland supply depot
KUD.....	Koperasi Unit Desa, Village Cooperative
ORD.....	Organisme Régional de Développement

## Organizations

AIC.....	Agricultural Inputs Corporation
CCCE.....	Caisse Central de la Cooperation Economique
CMA.....	Corporación de Mercadeo Agrícola
CSPPA.....	Caisse de Stabilisation des Prix des Produits Agricoles
DGA.....	Direction Generale de l'Agriculture
FAO.....	Food and Agriculture Organization of the United Nations
FASOYAAR.....	Societe Burkinase de Commercialisation
FEDECAFE.....	Federacion de Cafeteros
GPMB.....	Gambia Produce Marketing Board
IDEMA.....	Instituto de Mercadeo Agropecuario
IFDC.....	International Fertilizer Development Center
INTA.....	Instituto Nacional de Tecnologia Agropecuaria
IVP.....	Instituto Venezolano de Petroquímica
MONOMEROS.....	Monomeros Colombo Venezolanos, S.A.
NAMBOARD.....	National Agricultural Marketing Board
NCAER.....	National Council of Applied Economic Research
NCZ.....	Nitrogen Chemicals Limited
ODEPA.....	Oficina de Planificacion Agrícola
OFNACER.....	Office National de Céréales
PDVSA.....	Petroleos de Venezuela, S.A.
PEQUIVEN.....	Petroquímica de Venezuela, S.A.
PT. PUSRI.....	PT. Pupuk Sriwidjaja
SEAG.....	Secretaria de Agricultura y Ganaderia
SIVENG.....	Société Ivoirienne d'Engrais
SOFITEX.....	Société Voltaïque des Fibres Textiles
SOSUHV.....	Société Sucrière de Haute Volta
STEPC.....	Société Tropicale d'Engrais et de Produits Chimiques
VENFERCA.....	Venezolana de Fertilizantes, C.A.
ZFC.....	Zimbabwe Fertilizer Corporation Limited



## SUMMARY

by  
Gene T. Harris

### Purpose

The purpose of a fertilizer subsidy in most countries is to encourage the farmer to use more fertilizer and thereby increase agricultural production. In Indonesia the fertilizer subsidy has been used as an important input in programs to attain self-sufficiency in the production of rice and other food crops. Fertilizer consumption in Indonesia has increased at an annual rate of 16% during the past 15 years as a result of these programs. In Burkina Faso fertilizers were subsidized as a short-term measure primarily for cotton, but the subsidies were continued because of large food deficits. Argentina is using fertilizers in an attempt to increase foreign exchange earnings by producing more grain. In the Ivory Coast fertilizer is subsidized to increase production of cotton, the major cash crop, and to reduce rice imports, which have increased as the population has migrated to the cities. In Gambia, groundnut production is the major source of foreign exchange earnings, and fertilizers have been subsidized in order to promote groundnut production. In Colombia fertilizer is subsidized to promote exports by encouraging farmers to use modern coffee varieties. The subsidy is used to influence coffee production, and the percentage the fertilizer is subsidized depends on the country's coffee stocks and the world supply/demand situation. In Zambia subsidies have been used to reduce food imports and improve the standard of living.

### How Subsidies are Set

Many countries set the fertilizer price by using the subsidy mechanism. Several countries including India, Indonesia, Ivory Coast, Nepal, the Philippines, Turkey, and Venezuela also set crop prices. Chile, which has no subsidy, sets minimum crop prices related to international market prices. There does not seem to be a fixed fertilizer:crop price ratio that countries are trying to achieve in setting the fertilizer subsidy or in setting crop and fertilizer price relationships. The levels of crop prices and fertilizer prices are generally political decisions, which are made at high levels of government and on the basis of the country's finances and present food situation as well as its goals and trade policies. Countries try to set crop:fertilizer price relationships so that fertilizer use is encouraged. In Sierra Leone fertilizer prices are set by a cabinet decision. In Zambia recommendations are made by the National Agricultural Marketing Board in conjunction with the Department of Agriculture and approved by the Cabinet. Indonesia tries to set crop prices and fertilizer prices so that a ratio of 2.0 is achieved. In India price subsidies are used on grain sales through a large number of Government-controlled fair price shops. In Turkey wheat is the major food crop. The wheat:

fertilizer price ratio is set so that it encourages wheat farmers to use fertilizer. Other prices are set in relation to that of wheat.

In most countries the subsidy is set for 1 year. In Colombia the fertilizer price is set by the Government every 3 months to reflect changes in inflation or currency devaluations. The fertilizer subsidy in Colombia is changed whenever the fertilizer price is changed. Prices in Sierra Leone changed twice during 1984. Fertilizer prices in Indonesia remained constant from 1977 to November 1982 and have not changed since then. In India fertilizer prices have been in effect since June 1983.

In countries such as India, where crop prices are set by the Government, this is usually done annually. In Colombia minimum crop prices are changed twice per year. Prices are usually set immediately preceding the cropping season. However, in Venezuela prices for many crops have been in effect since 1980. Prices of maize were set in 1981 and those of rice in 1982.

#### Amount of Subsidy

Burkina Faso subsidizes about 40% of the actual cost of fertilizer, but this amount is being reduced each year. The new subsidy in Venezuela includes a reduction of 50% in the selling price of each fertilizer product and an additional adjustment according to the new exchange rate for imported raw materials. In Saudi Arabia the fertilizer subsidy, before being abolished, was set at 50% of the ex-factory or the c.i.f. import price. When the subsidy was in effect in the Philippines, urea was subsidized at about 30% of the selling price. The subsidy for locally produced compounds such as 14-14-14 was about twice the rate of the subsidy on imported products. In Gambia 61% of the urea price, 62% of the diammonium phosphate (DAP) price, and 96% of the single superphosphate (SSP) price is subsidized. In Sri Lanka urea receives a subsidy of 56% while monoammonium phosphate (MOP) receives a subsidy of only 33%. In Zambia where urea is imported, it receives less than a 1% subsidy while ammonium nitrate and ammonium sulfate received 25% subsidies.

Sri Lanka at one time paid the subsidy as a percentage of the c.i.f. import price. Today, however, fixed sums are allocated for the different fertilizers. Approximately 70% of the total Government expenditure is spent on urea. Ammonium sulfate (AS) is not subsidized because it is the policy of the Government to encourage urea usage because of its high nitrogen content and local urea-manufacturing facilities.

In Colombia the price of natural gas used as a fertilizer feedstock is set at 60% of the price charged for industrial use. In India natural gas is sold by the Government to the fertilizer industry at lower prices than to other consumers. However, this rate is still higher than that paid by fertilizer manufacturers in other countries. The producer in India is subsidized to cover high gas costs, high custom and excise duties, and high capital

costs required to build the infrastructure that is provided by the Government of some countries. The subsidy is administered at the manufacturer level. In Zambia the government-controlled producer is given grants to purchase raw materials. In Indonesia the fertilizer price to the farmer is fixed, and the subsidy becomes the difference between this price and the actual costs of P.T. Pupuk Sriwidjaja, the company responsible for fertilizer distribution.

### Coverage

In most countries the fertilizer price is the same throughout the country for both small and large farmers and for all crops. In India some states offer additional subsidies of 25% and 33.3% to small and marginal farmers, respectively. The transport of fertilizer over difficult terrain receives an additional subsidy. In Nepal high transportation costs as well as the price of the fertilizer are subsidized. In Saudi Arabia when the subsidy was in effect farm-gate prices varied from area to area depending on the distance that fertilizer was transported.

In Colombia fertilizer is only subsidized for coffee. In Burkina Faso when fertilizer was used only for cotton, the cost of the subsidy was financed from cotton exports. In the Ivory Coast fertilizer made locally by the Société Ivoirienne d'Engrais (SIVENG) is subsidized for all buyers; in addition, the remaining costs are paid for cotton and irrigated rice growers by the advisory companies and indirectly by the Government. These costs include storage and transport. At one time the Philippines had a different subsidy for priority crops such as rice, feed grains, and vegetables than for cash crops. However, because of diversion of fertilizer from one crop to another the system was abandoned. At one time in Sri Lanka the same product was sold at different prices for use on different crops. However, Sri Lanka's experience was similar to that of the Philippines, and the policy was discontinued. Today even though the subsidies are the same for the same product on all crops, approximately 63% of the total subsidy expenditure goes for rice, because of the area grown and because urea and triple superphosphate (TSP), the major products used, are highly subsidized. Tea benefits very little from the subsidy because AS and local phosphate rock are used--neither of which is subsidized. In Indonesia the fertilizer price paid by the farmer is the same for all fertilizer products.

### Total Cost

In most countries it is difficult to calculate the total cost of the subsidy. In some countries such as India, warehousing, credit, transportation, and raw materials as well as the price of the fertilizer are subsidized. In other countries such as Sierra Leone, Government employees sell fertilizer, and this constitutes a subsidy to the extent that these costs are not reflected in the farmers' fertilizer price. Some countries, such as Argentina, offer tax concessions that have the same effect as a subsidy. In Chile

fertilizer is not directly subsidized, but low-cost credit programs serve as an indirect subsidy. In Zambia the Government pays domestic transportation and storage.

The fertilizer subsidy in many countries constitutes 2%-8% of the total agricultural budget, but in some countries it is much higher. During the past 4 years the fertilizer subsidy in Turkey has been equivalent to 74%-94% of the total agricultural budget and represents 4%-5% of the total Government budget. In Sri Lanka the subsidy represents about 2% of the total Government budget. There is an allocation of Rs 1,000 million, which has remained constant since 1981 and may continue to do so for the next few years. Thus, the subsidy each year declines in importance with inflation and the larger Government budget. In Colombia the fertilizer subsidy for coffee in 1983 represented 8% of the agricultural budget. In Gambia 2% of the agricultural budget is spent on the subsidy and in the Ivory Coast 5% is spent. In Zambia subsidies represented 19% of the agriculture budget in 1984. In India fertilizer subsidies are estimated to average \$55/metric ton of product.

## FERTILIZER SUBSIDIES IN ARGENTINA, 1984

by  
Felix M. Cirio<sup>1</sup> and Ing. Agr. Roberto Piterbarg<sup>2</sup>

### Current and Historical Fertilizer Situation

#### Fertilizer Use

Consumption of fertilizers in Argentina has increased only 30% in the last 10 years (Table 1). The average use has been about 200,000 mt of fertilizer products and 70,000 mt of nutrients. There has been a tendency toward use of more concentrated products. Urea and DAP are the most popular products and actually account for about two-thirds of total consumption (Table 2).

Table 1. Argentina: Consumption of Fertilizers

Year	Supply			Demand			Total Nutrients
	National	Imports	Totals	Nutrients			
	Production			N	P	K	
	- - - (mt of product) - - -			- - - - - (nutrient mt) - - - - -			
1972	110,114	154,397	264,511	49,101	20,636	5,546	75,283
1973	102,307	111,867	214,174	45,264	10,840	9,366	75,470
1974	64,652	123,684	188,336	35,109	13,358	5,635	54,102
1975	63,183	45,951	110,134	27,633	4,023	3,043	34,699
1976	68,951	113,921	182,872	45,719	12,827	4,096	62,642
1977	75,364	97,803	173,167	40,214	12,092	3,568	55,874
1978	92,710	98,111	190,821	44,412	14,206	4,727	63,345
1979	82,888	218,071	300,959	60,576	28,219	10,179	98,974
1980	85,318	172,170	257,488	65,355	21,827	7,266	94,447
1981	53,703	115,893	179,596	51,173	12,606	4,401	68,180
1982	74,481	129,342	203,823	50,926	19,953	4,699	75,577
1983	76,758	176,215	252,973	64,616	24,495	8,673	97,784

Source: Department of Fertilizer - Secretaria de Agricultura y Ganaderia (SEAG)

The most fertilized crop is wheat, which uses about 30% of the urea and 50%-60% of the DAP. Sugarcane accounts for 25% of the urea. The rest of the fertilizer is applied to several crops, including horticultural crops, potatoes, and vineyards. Wheat is the only grain fertilized. As a result of the 1984 fertilizer program, urea applied to wheat tripled, jumping from 25,000 mt in 1983 to 78,000 mt already applied in 1984.

1. Cabinet Advisor, Secretary of Agriculture, Buenos Aires, Argentina.

2. Director, Nacional de Fiscalization Agricola, Secretaria de Agricultura y Ganaderia, respectively.

Table 2. Argentina: Apparent Consumption of Fertilizers by Product

<u>Years</u>	<u>Products</u>		<u>Total</u>
	<u>Urea</u>	<u>18-46-0 (DAP)</u>	
	- - - - - ('000 product mt) - - - - -		
1972/73	43.3	54.3	264
1973/74	49.6	27.0	214
1974/75	40.6	29.1	188
1975/76	29.4	12.7	110
1976/77	58.7	44.6	183
1977/78	54.5	46.1	173
1978/79	49.4	48.3	191
1979/80	69.8	71.6	301
1980/81	76.9	97.6	257
1981/82	71.7	53.8	180
1982/83	58.6	80.0	206
1983/84	84.2	87.3	253

NOTE: Until 1976/77 agricultural years, Instituto Nacional de Tecnologia Agropecuaria (INTA).  
Since 1977 calendar year, SEAG.

Source: SEAG and INTA.

### Prices

Price ratios between fertilizer and agricultural products have been very volatile in Argentina. Changes of 40% from one year to the other have been common (Table 3). Prices of fertilizer have been double those prevailing in other countries (i.e., United States), thus discouraging farmers from using fertilizer. Fertilizers used for wheat are sold at a cheaper price than those used for other crops.

### The 1984 Fertilizer Program

The democratic Government came into power on December 10, 1983, and set up a fertilizer program designed to increase the consumption of fertilizers, especially for grain, as a way of increasing grain exports. Argentina is facing its biggest external debt in history. Because grain is the principal source of foreign exchange for Argentina, priority has been given to measures that increase the production of grain.

To achieve these goals the fertilizer program is intended to

1. Decrease fertilizer/grain price ratios.
2. Ensure fertilizer availability and financing.
3. Provide technical assistance to farmers.

Table 3. Argentina: Ratios of Prices of Agricultural Products and Fertilizers (tons of grain, beef, or milk per ton of fertilizer nutrient)

Year	Wheat		Corn N	Beef P <sub>2</sub> O <sub>5</sub>	Milk P <sub>2</sub> O <sub>5</sub>
	Urea <sup>a</sup>	DAP <sup>a</sup>			
1970	6.79	2.56	6.71	0.94	4.31
1971	7.88	1.66	8.70	0.70	4.29
1972	6.03	4.70	6.54	1.06	6.68
1973	4.77	3.39	5.13	0.87	5.00
1974	4.87	7.51	5.44	1.94	8.11
1975	10.19	9.56	14.57	3.65	13.71
1976	9.81	7.89	9.61	2.23	12.11
1977	5.07	3.95	6.50	1.66	6.83
1978	5.11	3.24	7.08	1.57	6.87
1979	4.81	2.75	6.77	0.66	4.02
1980	5.51	3.14	7.05	0.73	3.84
1981	6.67	3.29	8.45	0.83	4.30
1982	6.98	3.33	9.10	0.89	4.70

a. Expressed on nutrient basis.

Because Argentina's grain prices are determined by world market prices, a favorable fertilizer/grain price ratio must come from a reduction in fertilizer prices. Export taxes cannot suddenly be lowered because of inflation and budget deficit limitations.

To encourage more favorable ratios, the prevailing 25% import tax on nitrogen fertilizers has been eliminated. No import taxes have been levied on phosphates for the last 6-7 years,<sup>3</sup> and the Value Added Tax on all fertilizers has been reduced from 18% to 5%. These measures reduced the grain/nitrogen price ratio by 40% and the grain/DAP ratio by 15%.

In addition, the Government by means of the National Grain Board bought 75,000 mt of urea, which was distributed to farmers by the cooperatives and local grain traders. The farmers will pay for this fertilizer in harvested wheat at a fixed ratio of 2.5 kg of wheat/kg of urea used. The rest of the fertilizers are traded on a free market and benefit from the reduction in taxes previously mentioned. Finally, a special program has been designed to provide technical assistance to farmers by coordinating the work done by various private and official agents.

It is not clear whether or not the wheat program implies a subsidy. At the time the program is adopted the price of wheat is not known. When the price ratio was established, there were no subsidy assumptions although the price of urea was lower than the market price because of the scale of purchases.

3. This difference between nitrogen and phosphate in the fertilizer taxation policy was due to the fact that nitrogen is produced in Argentina, whereas all phosphates must be imported.



## FERTILIZER SUBSIDIES IN BURKINA FASO, 1984

by  
E. Leuchtmann<sup>1</sup>

### Current and Historical Fertilizer Use and Fertilizer and Crop Prices

Chemical fertilizers were introduced in Burkina Faso<sup>2</sup> exclusively for cotton production. Because cotton producers are also cereal producers, they were the first to experience the advantages of fertilizers for cereals.

#### Current and Historical Fertilizer Use

The most important fertilizer used until now in Burkina Faso is a compound NPK fertilizer, called "cotton fertilizer" (14-23-14 with 6% sulfur and 1% B<sub>2</sub>O<sub>3</sub>). Urea plays only a minor role. Since 1978 phosphate rock has also been used in small quantities. Details of fertilizer consumption are given in Table 1 below.

Table 1. Burkina Faso: Fertilizer Consumption, 1976-83

<u>Year</u>	<u>NPK for</u>		<u>Total</u>	<u>Urea<sup>a</sup></u>	<u>Phosphate Rock</u>
	<u>Cotton</u>	<u>Cereals</u>			
1976	3,810	1,793	5,683	NA	-
1977	5,277	3,432	8,709	NA	-
1978	5,930	5,545	11,475	NA	14
1979	7,607	6,464	14,071	2,000	383
1980	9,569	7,955	17,524	-	253
1981	7,539	8,430	15,977	-	878
1982 <sup>b</sup>	8,162	10,151	18,313	1,200	265
1983 <sup>b</sup>	8,712	13,103	21,815	2,700	300

a. Represents imports. It is not possible to distinguish between urea used for cereal and that used for cotton production.

b. Estimated figures.

Source: Société Voltaïque des Fibres Textiles (SOFITEX),  
Direction Generale de l'Agriculture (DGA), Phosphate  
Project.

Fertilizer consumption for cereals has increased rapidly and continuously since 1976 in spite of the fact that until now no NPK fertilizer formulated specifically for cereal production exists, and the cotton fertilizer is still being used and recommended.

1. Project Manager, Phosphate Project, Ouagadougou, Burkina Faso; German Technical Assistance, GTZ.

2. Formerly Upper Volta.

In addition to using NPK, urea, and phosphate rock, the sugar society of Burkina Faso, Société Sucrière de Haute Volta (SOSUHV), consumes some special fertilizers directly imported for sugarcane production. Private traders play no important role in supplying fertilizer to the farmers.

### Current and Historical Fertilizer and Crop Prices

Fertilizer prices have been artificially low because of subsidies; thus, their price to the farmer increased over the years much more slowly than did the producer price of agricultural products, particularly of cereals, as shown in Table 2 below.

Table 2. Burkina Faso: Cereal and Fertilizer Prices, 1976-84

Year	Official Producer Price of				Fertilizer Price Ex-Central Warehouse to ORDs <sup>a</sup>					
	Maize		Sorghum		NPK		Urea		Phosphate Rock	
	FCFA/ kg <sup>b</sup>	Index <sup>c</sup>	FCFA/ kg	Index	FCFA/ kg	Index <sup>c</sup>	FCFA/ kg	Index <sup>c</sup>	FCFA/ kg	Index <sup>d</sup>
1976	23	100	23	100	35	100	35	100	-	-
1977	32	139	32	139	35	100	35	100	-	-
1978	40	174	40	174	35	100	35	100	10/12	100
1979	40	174	40	174	35	100	35	100	10/12	100
1980	50	217	50	217	40	114	40	114	10/12	100
1981	55	239	55	239	40	114	40	114	10/12	100
1982	55	239	58	252	40/55	114/157	40/55	114/157	25	250/208
1983	55	239	58	252	62	177	62	177	25	250/208
1984	60	261	64	278	78	223	66	189	26	260/217

- a. Organismes Régionaux de Développement (11 in total), responsible for all regional development also for making available agricultural inputs to farmers.  
b. Current exchange rate is US \$1 = FCFA 461.15. FCFA is the African Financial Community franc.  
c. 1976 = 100.  
d. 1978 = 100.

The actual fertilizer sale price to farmers as sold by the Organisme Régional de Développement (ORD) is higher than the price ex-warehouse (for details see sections on procedure and criteria). At present (May 1984), in the local market in Ouagadougou sorghum is sold at FCFA 120-145/kg (100-kg bag) or up to FCFA 160/kg in small quantities. The Ouagadougou market is not the most expensive market in Burkina Faso!

### The Current Status of Subsidies

With the exception of special fertilizers imported by SOSUHV, all fertilizers used in Burkina Faso are subsidized, whether imported (NPK, urea) or locally produced (phosphate rock). NPK is exclusively imported by SOFITEX and urea by the Government,

the Ministry of Agriculture and Animal Husbandry. Fertilizer is stocked in central warehouses of SOFITEX (Bobo-Dioulasso, Dédougou, Koudougou, Ouagadougou), of the Government (both in Ouagadougou and Bobo-Dioulasso) and of the Phosphate Project (Diapaga, Ouagadougou, and Bobo-Dioulasso). From these central stores fertilizers are sold to the ORDs, which are in charge of its distribution to the farmers. NPK and urea are sold to the farmers exclusively by the ORDs. Only the Phosphate Project can also sell directly ex-central warehouse to the consumer.

### Fertilizer Subsidy Procedure

NPK and Urea--NPK fertilizers and urea are imported at full-cost prices. This purchase price will then be subsidized with the effect that the ORDs buy at reduced prices. On the ORD level the actual sale price to the farmer will be slightly higher than the price ex-central warehouse, to allow for covering transport, handling, and storage costs. Officially the ORDs can sell at 7% higher prices (cash sales), but in reality each ORD fixes its sale price individually depending on the distance to the central warehouse and the distribution costs to the small warehouses within its respective area. At present the ORDs buy NPK and urea at FCFA 78 and 66/kg ex-central warehouse but sell NPK to the farmers at FCFA 80-85/kg and urea at FCFA 68-80/kg.

Phosphate Rock--The production of local phosphate rock is done within the framework of a special development project with technical and financial assistance from the Federal Republic of Germany. Until the end of 1983 West Germany subsidized the mining, milling, transport to the central warehouses, storage, and "marketing costs" by installing the necessary equipment and infrastructure as well as by participating in financing one-third of the running costs, thus subsidizing the production of phosphate rock. Beginning in 1984, the West German Government guarantees a subsidy of FCFA 20/kg phosphate rock sold, thus subsidizing the sale of phosphate rock. At present local phosphate rock is sold ex-central warehouse at FCFA 26/kg, and the ORDs sell it (cash sale) at FCFA 20-35/kg. Sales at lower than purchase price are made possible by special development projects with financing from abroad.

### Criteria for Setting of Fertilizer Prices and Subsidies

The most important criteria for setting fertilizer prices until 1982 were the economics of agricultural production to encourage farmers to increase production of cash crops as well as food crops, both vitally important for Burkina Faso.

Because the financing of subsidies with increasing fertilizer prices became an impossible burden for the Government, the Government since 1983 has implemented a policy based on the following criteria:

1. Decreasing subsidies from 40% to the lowest possible rate and, if possible, complete elimination by 1988/89 for all fertilizers.
2. Balancing fertilizer and crop prices as far as possible to guarantee the farmers the economic use of fertilizers and to increase production, particularly of food crops.
3. Replacing imported fertilizers, particularly P and N fertilizers, as far as possible with local phosphate rock and organic matter, especially for cereal production.

#### Purpose of Fertilizer Subsidy

During the 1970s, when fertilizer prices increased substantially on the world market, the Government wanted to stabilize the sale price of fertilizers to farmers by introducing a subsidy as a short-term measure. But fertilizer prices continued to rise in the following years and up to the present; at the same time consumption was increasing particularly for food. In addition, the annual food shortage in the country demanded all efforts to increase cereal production by using yield-increasing inputs. Thus, the Government had no choice but to continue subsidizing the fertilizers.

#### Fertilizer Subsidy

The rate of subsidy is fixed annually by the Government by fixing the sales price to ORDs, following proposals by the Ministry of Agriculture and Animal Husbandry, in November, December, or January. Consequently, the subsidy rate changes every year. Since 1983 the Government, in close cooperation with the World Bank and the Caisse Central de la Cooperation Economique (CCCE, French Government agency), has adopted a new policy that will reduce subsidies in the following years to the lowest possible rate, aiming at eliminating subsidies entirely after 1988/89.

In implementing this policy all fertilizers in Burkina Faso, whether imported or locally produced, will be subsidized at the same rate; this is aiming at approximately 40% in 1984, 30% in 1985, 20% in 1986, 10% in 1987, and no subsidies from 1988 onward.

#### Effect of Government Programs on Crop Prices

The Government fixes annually the official purchase and sale prices for all crops that are handled by Office National de Céréales (OFNACER) as far as cereals are concerned as well as rice. OFNACER has price regulatory functions, handles food aids from abroad, and keeps security stocks. OFNACER handles only a relatively small percentage of the marketed cereal crop. By far

the largest part is marketed by local traders on a free market basis. But one has to understand that the largest part of the crop is consumed on the farms and not marketed.

Table 3 gives an idea of the different food crop price developments since 1970.

Table 3. Burkina Faso: Official Producer Prices and the Indices of Official Sale Price and Market Prices for Sorghum, Millet, and Maize, 1970-82

Year	Official Producer Price and Index		Ouagadougou Market Price Index	Official Sale Price Index to Consumer
	FCFA/kg	1970 = 100	1970 = 100	1970 = 100
1970	12	100	100	100
1971	12	100	125	102
1972	14	117	128	93
1973	18	150	188	107
1974	22	183	188	113
1975	18	150	138	136
1976	23	192	178	124
1977	32	267	388	161
1978	40	333	388	175
1979	40	333	413	201
1980	45	375	403	226
1981	50	417	413	243
1982	58/60/55	483/500/458	NA	NA

Note: Until 1981 the prices for sorghum, millet, and maize were the same.

Source: Institut National de la Statistique et de la Démographie, Ministère du Plan et de la Coopération, Ouagadougou, "Bulletin Mensuel d'Information Statistique et Economique."

Crop prices fluctuate greatly from one year to the other as well as within one year, depending on the season as well as on the season's rainfall pattern and thus production. Table 4 shows the price fluctuations of consumer prices for sorghum and millet for the years 1962-79 of Ouagadougou market.

Table 4. Burkina Faso: Seasonal and Interannual Consumer Price Fluctuations of Sorghum and Millet for Ouagadougou Market, 1962-79

<u>Year</u>	<u>Seasonal Price Maximum/Minimum (FCFA)</u>	<u>Interannual % Change of Average Price</u>	<u>Year</u>	<u>Seasonal Price Maximum/Minimum (FCFA)</u>	<u>Interannual % Change of Average Price</u>
1962	1,833	-	1971	1,633	24.7
1963	1,700	-4.7	1972	2,148	2.1
1964	1,579	-2.9	1973	2,235	47.0
1965	1,526	-7.4	1974	2,194	-3.6
1966	1,632	13.8	1975	2,280	-23.1
1967	1,455	4.0	1976	1,944	14.8
1968	1,750	-25.0	1977	2,210	117.5
1969	1,955	38.3	1978	3,000	NA
1970	1,500	13.8	1979	1,552	NA

Source: Institut National de la Statistique et de la Démographie, "Bulletin Mensuel d'Information Statistique et Economique," divers numeros.

The table shows considerable price differences of approximately 50% a year and 200% between different years. Producer price fluctuations are not available, but it is believed that they are similar to consumer price fluctuations.

Appendix Table 1 shows the planted crop acreage as well as the estimated production per year for the agricultural seasons 1978/79-1983/84. Burkina Faso produces approximately 1.3 million mt of cereals per year:

Sorghum, millet	1.100 million mt
Maize	0.120 million mt
Rice	0.036 million mt
Others	0.013 million mt

To this local production the following figures must be added:

1. Food aid received by OFNACER in very different quantities but which can total approximately 40,000 mtpy.
2. Other food aid from the World Food Program and private Christian organizations of approximately 25,000 mtpy.
3. Imports, particularly rice, by traders and Government organizations, such as Societe Burkinase de Commercialisation (FASOYAAR); OFNACER; and the army in variable quantities of up to 80,000 mtpy.

(Figures taken from World Bank reports, Fertilizer Project).

The food deficit this year is estimated by the Government to be approximately 130,000 mt.

### Cost of Subsidy

Table 5 compares import prices of NPK fertilizer with official sale price to ORDs and the respective subsidies.

Table 5. Burkina Faso: Compound Fertilizer (NPK) Price and Subsidy Statistics, 1976-84

Year	Import Price c.i.f. BF	Sales Price to ORDs	Subsidy		Total Subsidy <sup>a</sup> (million FCFA)		
	FCFA/mt	FCFA/mt	FCFA/mt	%	Cotton	Cereals	Total
1976	73,908	35,000	38,908	53	148.2	71.0	219.2
1977	71,880	35,000	36,880	51	194.6	127.0	321.6
1978	74,035	35,000	39,035	53	231.5	218.0	449.5
1979	79,494	35,000	44,494	56	338.5	286.6	625.1
1980	94,609	40,000	54,609	58	515.1	433.2	948.3
1981	111,341	40,000 <sup>b</sup>	71,341	64	534.2	557.9	1,092.1
1982	120,582	43,494 <sup>b</sup>	77,088 <sup>b</sup>	64	652.6 <sup>b</sup>	786.6	1,438.6
1983	120,730	62,000	58,730	49	511.7	769.5	1,281.2
1984 <sup>c</sup>	129,000	78,000	51,000	40	479.3	622.2	1,101.5

a. Based on consumption given in Table 1.

b. In the middle of the season, prices were increased from FCFA 40,000/mt to FCFA 55,000/mt; 4,265 mt was sold at the higher price.

c. Estimates. Current exchange rate is US \$1 = 460 FCFA.

Source: Preparatory report of Fertilizer Project Burkina Faso, World Bank. SOFITEX.

The costs of subsidy increased steadily until 1982. Since then, the Government has changed its subsidy policy drastically, with the result of decreasing subsidy costs. Details of this new policy are given in the section on fertilizer subsidy.

As long as the fertilizer was used only for cotton production, the cost of subsidy was financed from the income of cotton exportation by SOFITEX. When fertilizer was imported for cereal production (actually, more "cotton fertilizer" was imported, but it was used for food production), SOFITEX was no longer able to pay for the subsidy with funds derived from cotton exportation. Consequently, the cost of "cereal fertilizer" subsidy was to be financed by the Government budget. In fact, the Government placed SOFITEX in charge of ensuring the fertilizer supply also

for cereal production. Since the Government was not in a position to finance these subsidies from its ordinary budget because of lack of funds, the extraordinary budget was used, particularly the funds of the Caisse de Stabilisation des Prix des Produits Agricoles (CSPPA).

The cost of subsidy for phosphate rock is still very high per unit of product, and it is primarily financed by the West German Government. The main reasons for these high costs are as follows:

1. The pilot character of the milling unit installed.
2. The small quantities used. (The installed milling unit is used only 10%-30% of its capacity, but this is not even regular every year.)

Internal calculations of the Phosphate Project on production costs demonstrate the situation as given in the following table.

Table 6. Burkina Faso: Price Calculation of Phosphate Rock Ex-Warehouse in '000 FCFA, Situation at End of 1983

Activity	Fixed Costs	Variable Cost of Production of			Total Cost of Production of		
		1,000 mt	1,300 mt	1,500 mt	1,000 mt	1,300 mt	1,500 mt
		1	2	3	4	1 + 2	1 + 3
Mining	-	3,520	4,576	5,280	3,520	4,576	5,280
Milling	5,780	22,742	29,565	34,113	28,522	35,345	39,893
Marketing	5,094	-	-	-	5,094	5,094	5,094
Transport	-	10,622	13,808	15,932	10,622	13,808	15,932
Administration	14,841	-	-	-	14,841	14,841	14,841
Total	25,715	36,884	47,949	55,325	62,599	73,664	81,040
Price in FCFA/kg (without depreciation)					62.60	56.66	54.03

Appendix Table 1. Burkina Faso: Cultivated Acreage and Production of Principal Crops, 1978/79-1983/84

Crop	1978/79		1979/80		1980/81		1981/82		1982/83		1983/84	
	'000 ha	'000 mt	'000 ha	'000 mt	'000 ha	'000 mt	'000 ha	'000 mt	'000 ha	'000 mt	'000 ha	'000 mt
<u>Food Crops</u>	1,995	1,130	1,996	1,134	1,803	1,009	2,136	1,225	NA	1,350	NA	1,135
Millet	768	378	768	378	720	351	900	443	NA		NA	NA
Sorghum	1,098	635	1,106	653	957	547	1,084	659	NA	1,027	NA	NA
Maize	116	108	110	99	116	105	143	118	NA	141	NA	NA
Other	13	9	12	4	10	6	9	5	NA	NA	NA	NA
<u>Cash Crops</u>	257	143	277	167	205	124	217	145	NA	198	NA	NA
Groundnuts	152	74	154	78	106	54	128	78	NA	83	NA	NA
Cotton	76	62	84	80	77	64	66	59	NA	76	NA	70
Sesame	29	7	39	9	22	6	23	8	NA	NA	NA	NA
Rice paddy	35	41	31	48	37	45	39	43	NA	39	NA	NA

Source: 1978/79 to 1981/82, Ministère de Développement Rural, Bulletin de Statistiques Agricoles.  
1982/83 and 1983/84, Ministère de Développement Rural, internal papers and information.



## FERTILIZER SUBSIDIES IN CHILE, 1984

by  
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### Current and Historical Fertilizer Use and Fertilizer and Crop Prices

#### Fertilizer Use

Nitrogen consumption has recently reached a level similar to that of phosphorus, which had traditionally been the leading nutrient in Chile's fertilization programs. Potassium remains in a distant third place. Current sources of nitrogen are Chilean nitrates 16-0-0 and 15-0-14, urea, and DAP. Sources of phosphorus are TSP, DAP, and SSP. Potassium is supplied by Chilean nitrate (15-0-14) and potassium sulfate. The yearly amounts of N, P, and K and the main fertilizers used in Chile from 1964 to 1983 are shown in Table 1.

The number of other sources of primary nutrients, as well as the tonnage, has decreased with time.

#### Fertilizer and Crop Prices

Current and historical prices of the main fertilizer products are shown in Table 2, and those of several crops are shown in Table 3. Figures are averages for each year. Fertilizer prices are those of ex-warehouse retailers. Crop prices are wholesale, based on the values paid in Santiago City.

#### Current Status of Subsidies

Fertilizers in Chile are not currently subsidized. Like any other agricultural input, fertilizers may benefit from some special credits given to farmers at lower interest rates and/or longer periods for repayment. These types of credits are given for long-term investment projects (for example, for planting fruit orchards and development of livestock and pastures), and in the case of small farmers also for short-term operation inputs (seeds, fertilizers, pesticides).

1. Marketing, Sociedad Quimica y Minera de Chile, S.A., Santiago, Chile.
2. Oficina de Planification Agricola (ODEPA); Ministerio de Agricultura, Santiago, Chile.

Table 1. Chile: Current and Historical Use of Primary Nutrients and Main Fertilizers, 1964-83

Year	Primary Nutrients			Chilean Nitrate	Chilean Nitrate	Urea	DAP	TSP	Single Super-phosphate	Potassium Sulfate	Others <sup>a</sup>
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	16-0-0	15-0-14						
	----- (mt) -----										
1964	32,800	73,771	16,344	119,400	79,800	-	-	80,300	6,400	5,000	132,515
1965	33,100	73,253	15,720	123,300	79,400	-	-	84,200	10,700	5,100	111,500
1966	37,500	84,809	20,668	138,400	93,700	200	-	115,300	13,100	10,100	91,350
1967	38,200	75,104	12,463	169,830	62,157	600	-	103,400	9,400	4,500	84,750
1968	33,900	96,885	9,836	145,680	34,657	4,000	-	124,600	14,200	5,000	125,973
1969	45,100	98,874	13,645	129,010	34,979	18,500	-	124,900	27,600	4,500	148,400
1970	44,426	98,584	15,065	84,623	71,148	26,885	12,141	142,113	20,651	8,013	91,273
1971	49,695	103,643	16,698	112,044	84,503	23,875	20,867	115,110	18,866	6,656	75,730
1972	54,725	84,658	18,852	158,086	83,330	28,309	11,081	100,841	19,730	10,907	104,759
1973	60,733	121,152	15,588	142,204	48,036	24,645	101,403	93,800	29,245	15,883	75,869
1974	52,967	103,479	16,176	142,818	46,154	24,859	61,776	121,296	23,172	19,207	44,241
1975	37,469	57,545	8,402	140,466	32,930	11,748	22,184	62,849	26,923	6,970	39,684
1976	49,928	64,298	14,794	168,507	39,473	21,583	33,056	79,086	12,659	16,992	36,642
1977	38,116	59,323	9,952	114,526	38,159	22,624	15,978	89,002	28,187	7,523	18,795
1978	50,032	65,950	13,463	123,570	53,634	32,666	37,888	100,381	-	10,872	6,114
1979	56,726	75,844	13,674	100,818	42,767	54,184	45,518	101,903	9,223	13,189	11,592
1980	52,369	70,954	14,417	83,186	41,899	51,566	44,646	100,371	4,873	14,453	11,724
1981	49,253	56,458	13,170	84,546	39,015	48,164	37,110	75,685	8,721	13,149	11,091
1982	48,760	48,500	12,477	165,024	47,478	23,378	22,282	73,797	10,371	9,606	7,102
1983	65,230	62,037	11,935	177,804	39,072	53,461	36,132	91,623	5,515	11,665	5,970

a. Includes: Guanos, until 1977; mixed phosphates, until 1979; dicalcium phosphate, until 1973; basic slag, until 1973; thermal phosphates, until 1972; bone meal, until 1970; and some bulk blends and complex used in 1970, 1971, and 1976-83.

Table 2. Chile: Current and Historical Prices of Main Fertilizer Products, 1965-84<sup>a</sup>

Year	Chilean Nitrate 16-0-0	Chilean Nitrate 15-0-14	Urea	DAP	TSP	Single Super-phosphate	Potassium Sulfate
(US \$/mt)							
1965	26.4	30.9	-	-	31.6	-	43.6
1966	29.2	35.1	-	-	46.4	-	50.3
1967	28.5	34.8	64.2	60.1	43.1	35.6	60.5
1968	29.8	37.1	68.8	49.8	35.0	28.1	47.8
1969	31.9	38.8	58.3	59.2	42.4	33.4	61.3
1970	32.3	45.1	54.3	59.4	42.9	40.1	65.8
1971	26.9	37.6	47.0	51.8	39.2	41.0	54.8
1972	19.0	25.4	39.6	36.4	27.5	29.0	49.5
1973	88.4	110.6	92.5	90.6	87.8	50.0	94.9
1974	124.8	156.9	241.3	282.2	247.5	128.4	155.9
1975	186.6	260.2	559.5	594.5	584.4	223.7	-
1976	131.3	195.8	266.2	303.3	271.2	125.3	-
1977	106.8	143.3	200.0	220.2	163.5	77.5	195.7
1978	124.3	152.1	249.6	216.7	195.0	-	216.0
1979	138.0	173.8	272.4	285.5	240.6	206.9	256.7
1980	131.9	174.3	267.5	323.5	257.2	178.0	253.1
1981	122.8	167.7	251.1	256.0	210.9	146.6	248.7
1982	79.1	131.6	262.0	298.4	247.6	137.7	312.1
1983	100.6	180.5	277.5	329.0	276.7	211.5	341.3
1984 <sup>b</sup>	129.6	191.3	309.7	347.2	265.3	193.0	338.6

a. Prices are expressed in U.S. dollars, at the exchange rate of Chilean \$91.13/US \$1 in June 1984. Prior to this change transformation, prices in Chilean currency were deflated to the value of June 1984, to compensate for inflation.

b. 1984--January to June.

### Fertilizer Subsidy

The fertilizer subsidy was eliminated by the end of 1973 and has not been reestablished. The subsidy was started in 1952 and began at 50% of the value of each fertilizer. As a consequence of inflation, the subsidy had decreased to 10% in 1956. The subsidy was not paid between 1957 and 1960 because of lack of Government resources.

In 1960 the subsidy was reestablished, calculated at 33.3% for Chilean nitrates and at 25% or 50% for phosphates depending on the region of the country. The 50% was applied to the southern agricultural area, where soils require large amounts of phosphorus. In 1962 a higher subsidy was given to a Chilean thermal phosphate fertilizer, but its production ceased a few years later.

Table 3. Chile: Current and Historical Prices of Several Crops, 1965-84<sup>a</sup>

Year	Wheat	Corn	Sugar		Potatoes	Rice	Oats	Rape
			Beet	Barley				
-- -- (US \$/mt) -- --								
1965	69.6	63.5	-	66.8	43.1	57.2	58.0	-
1966	73.1	70.1	-	76.0	42.8	85.3	75.2	-
1967	71.2	69.3	-	68.9	35.4	76.8	71.3	-
1968	70.7	63.5	17.5	53.6	35.8	81.3	45.1	-
1969	74.1	57.3	18.0	67.1	25.5	80.7	45.5	133.4
1970	73.4	58.6	19.0	74.4	27.7	84.7	70.1	124.9
1971	74.4	82.2	20.0	73.3	30.4	88.5	70.3	136.1
1972	68.3	75.5	15.9	69.8	44.9	78.4	74.3	126.8
1973	44.5	236.9	22.3	150.3	171.2	96.4	159.2	109.9
1974	172.9	122.5	28.4	146.4	44.2	178.0	118.9	224.9
1975	230.0	174.4	51.2	157.0	160.4	241.0	102.2	361.3
1976	203.8	175.2	42.2	207.9	179.7	247.3	136.5	330.0
1977	206.0	140.0	32.4	164.0	114.4	213.7	140.8	298.2
1978	192.4	170.5	31.7	156.2	93.5	213.8	167.7	346.2
1979	190.8	164.3	30.5	161.4	158.1	178.0	157.1	338.1
1980	177.0	158.4	44.0	152.6	145.6	149.7	108.7	252.5
1981	164.3	129.5	35.6	139.8	112.9	176.8	153.6	224.5
1982	152.9	130.2	36.2	123.5	146.7	145.5	131.1	156.1
1983 <sup>b</sup>	212.1	176.5	48.4	142.6	183.5	147.3	135.2	181.2
1984 <sup>b</sup>	216.1	177.3	49.3	175.7	116.1	179.7	129.7	309.8

a. Prices are expressed in U.S. dollars at the exchange rate in June 1984 of \$91.13/US \$1. Prior to this change, prices in Chilean currency were deflated to the value of June 1984, to compensate for inflation.

b. 1984--January to June.

The subsidy for Chilean nitrates had been fixed at a nominal value. Because of inflation, in 1965 it had decreased to 13.7% of the current price. In 1965 the cost of the fertilizer subsidy was very high for the Government. After that year, phosphates were subsidized only for the soluble fraction of their total phosphorus content. Subsidy was a nominal value assigned to each kilogram of soluble  $P_2O_5$  at the same rate for the whole territory. At the same time, the nominal value of the subsidy for Chilean nitrate was slightly increased, and the subsidy for potassium fertilizers was eliminated. By the end of the 1960s, urea and DAP were imported by Chile but were not subsidized.

#### Effect of Government Programs on Crop Prices

Government programs guarantee minimum prices for wheat, beginning with the 1983/84 season, as well as for rape and sunflower for the 1984/85 season. Sugar beets also have guaranteed

prices. The sugar industry is owned by the Government and makes contracts with farmers. Minimum prices are related to prices in the international market.

### Wheat

A range, which has a minimum and a maximum value, is established for the price to be paid for wheat. The range, which lasts 1 year, is calculated on the basis of the cost of wheat importation and includes the c.i.f. value plus 20% for customs and other corresponding costs. The reference price is that of No. 2 hard red winter wheat, f.o.b. the U.S. Gulf, in U.S. dollars.

The minimum reference price is the value immediately above the 12 lowest months' average prices observed during the period of the last 60 months ending in February.

The maximum reference price is the value immediately below the 12 highest months' average prices observed in the same 60-month period. If necessary, to keep the lower or the upper limit of the band, modifications to customs can be applied. Prices paid to farmers are about 88% of those determined in the range.

### Rape and Sunflower

These crops are used to produce oil. A price range, lasting 1 year, is established for the cost of importation of oil. The range includes the c.i.f. cost plus the 20% for customs. The reference price is that of crude soybean oil bulk f.o.b. Rotterdam, in U.S. dollars. The upper and lower limits of the range are determined in a similar way to those for wheat.

### Sugar Beet

The sugar industry is owned by the Government and pays a guaranteed price to farmers under contract each season. Price is established in dollars, with payments being made in Chilean currency.

### Crops on Which Fertilizers are Used

There is no published information about the amount of fertilizer used by each of the different crops grown in Chile. The use by crop of the primary nutrients is estimated to have the following general pattern (fruits and vineyards are grouped together, as well as pastures and forage crops).

### Nitrogen

Wheat is the main user. Corn and fruits and vineyards share second place. Sugar beets come next, followed by vegetables, pastures and forage crops, and potatoes. Barley, oats, rape, and rice use smaller amounts.

### Phosphorus

Wheat is the main user, followed by sugar beets. Other users, in decreasing order, are pastures and forage crops, potatoes, corn, barley, oats, rape, and vegetables.

### Potassium

The main users are fruits and vineyards, pastures and forage crops, sugar beets, vegetables, and potatoes.

## FERTILIZER SUBSIDIES IN COLOMBIA

by  
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### Fertilizer Use and Fertilizer and Crop Prices

The types of fertilizers used in Colombia for different crops are shown in Table 1. In general, crops can be classified according to the fertilizer used: (1) crops fertilized mainly with NPK products and (2) crops, such as bananas and sugarcane, fertilized mainly with straight products. Fertilizer prices are shown in Table 2. Fertilizer prices for compound fertilizers are fixed by the Government and revised every 3 months. Straight fertilizers are imported monthly, and therefore prices are derived from imports.

Crop prices are shown in Table 3 for guaranteed prices set by the Government. Prices are revised twice a year for the given crop.

### Current Status of Fertilizer Subsidies

Fertilizers receive subsidies only for coffee grades. These subsidies are set by the "Federacion de Cafeteros" (FEDECAFE), the largest private cooperative-type organization in Colombia. FEDECAFE limits the amount of fertilizers it sells to each farmer according to the size of his farm. In 1982, because of the large international stock of coffee and a depressed price, it reduced the amount of fertilizer sold to each farmer, with the aim of reducing production. Fertilizer prices for coffee are uniform in the country.

Natural gas is also set at a lower price for the ammonia producers. This lower price for natural gas was not reflected in the price of ammonia, and only recently ammonia prices were set under Government control.

Fertilizer prices are set by the Government every 3 months. Prices are revised to reflect changes in inflation or devaluation of the Colombian currency, which leads to increases in the prices of raw materials. Subsidies are set only by FEDECAFE. Subsidies reflect the situation with regard to coffee prices and coffee stocks. The price of natural gas as a feedstock for ammonia is currently set at 60% of that of natural gas for industrial use.

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Table 1. Colombia: Fertilizer Products Used by Crop, 1980

Crops	NPK Products			Straight Products					
	High P <sub>2</sub> O <sub>5</sub> Formulations	Coffee		Urea	AS	AN	TSP/DAP	Basic	
		Formulation 17-6-18/2	1:1:1 Formulation					Slag	KCl
- ('000 mt) -									
Potatoes	122.1		30.0	-	-	-	-	10.0	-
Coffee	-	139.0	35.0	36.0	-	-	-	-	6.0
Rice	11.5	-	16.0	58.0	10.0	-	0.6	17.0	7.0
Sugarcane (sugar)	-	-	-	20.0	-	-	2.0	-	3.5
Sugarcane (panela)	3.0	-	5.0	3.0	-	-	-	-	-
Cotton	1.0	-	1.5	13.0	7.0	-	-	2.0	1.0
Bananas	-	-	-	12.5	-	-	3.0	-	15.0
Corn	6.0	-	14.0	10.0	-	1.0	-	-	-
Pastures	-	-	-	10.0	-	19.4	-	25.0	-
Barley and wheat	8.0	-	6.0	-	-	-	-	2.0	-
Others	5.0	7.0	14.1	12.3	0.6	-	-	-	5.3
TOTAL	156.6	146.0	121.6	174.8	17.6	20.4	5.6	56.0	37.8

Note: AN = ammonium nitrate, KCl = potassium chloride.

Source: MONOMEROS, data supplied to IFDC. "A Fertilizer Study for MONOMEROS," October 1982.

Table 2. Colombia: Price of Fertilizers Wholesale (Col \$/mt f.o.b. Plant) by Date

Product	1981		1982		1983			1984				
	Nov. 27	Dec. 1	July 1	Sept. 26	Oct. 17	Dec. 1	Jan. 2	Feb. 7	Mar. 14	Apr. 3	May 1	June 5
<u>Mixed</u>												
13-26-6	17,524	18,050	20,000	20,000	20,800	20,800	20,800	22,942	22,942	22,942	25,236	25,236
15-15-15	15,590	16,058	17,780	17,780	18,491	18,491	18,491	20,137	20,137	20,137	21,740	21,740
17-6-18-2	16,000	16,480	18,300	18,300	19,032	19,032	19,032	20,345	20,345	20,345	21,973	21,973
8-30-12		18,746	20,400	20,400	21,216	21,216	21,216	23,338	23,338	23,338	25,438	25,438
25-15-0		14,000	15,000	16,000	17,120	17,120	17,120	18,370	18,370	18,370	19,747	19,747
<u>Straight</u>												
Urea	16,200	15,300	16,300	17,100	17,100	17,100	18,500	19,500	21,900	23,900	23,900	24,900
KCl-STD	11,000	10,450	11,500	12,500	12,500	12,500	13,800	13,800	15,000	15,600	17,000	17,000
SOP	19,000	21,850	21,850	23,000	23,000	27,000	28,000	29,200	30,000	31,000	32,500	32,500
AS	11,300	10,850	10,850	11,050	12,000	12,000	12,000	12,900	12,900	12,900	12,900	12,900
MAP/DAP	18,800	19,100	21,800	24,000	27,000	27,000	28,500	29,200	30,000	30,600	30,600	30,600
KCl-GRA		11,400	12,600	13,800	13,800	13,800	15,300	15,500	16,000	16,900	18,500	18,500

Note: KCl-STD and KCl-GRA = potassium chloride--standard grade and granular, SOP = potassium sulfate.

Current exchange rate US \$1.00 = Col \$106.86.

Table 3. Colombia: Minimum Guaranteed Prices Per Semester 1979-84 (Col \$/mt)

Product	1979		1980		1982		1983		1984	
	A <sup>a</sup>	B <sup>b</sup>	A	B <sup>c</sup>	A	B	A	B	A	B
Rapeseed	24,670	29,829	29,820	29,820	32,000	38,200	42,020	42,020	46,220	58,240
Barley	9,000	9,800	10,500	13,000	16,800	20,100	22,500	22,500	24,750	29,500
Maize yellow	7,950	9,540	11,200	13,200	17,000	20,900	22,780	22,780	25,060	26,310
Maize white	8,000	9,627	12,000	14,200	18,500	23,100	25,180	25,180	27,700	29,085
Sorghum	7,100	8,645	9,800	11,500	15,000	17,900	19,240	19,240	20,780	22,440
Soya	13,400	14,930	16,000	21,200	27,600	33,000	35,475	35,475	39,400	43,340
Wheat	10,000	12,000	14,000	15,500	19,000	22,500	24,750	24,750	26,730	29,500
Rice							22,600	22,600	24,180	25,390
Beans							64,130	64,130	69,900	85,000

a. Semester starts January 1.

b. Semester starts July 1.

c. Data for 1981 are not available.

Source: Instituto de Mercadeo Agropecuario (IDEMA).

The purpose of fertilizer subsidies for coffee is to promote exports by encouraging coffee growers to use modern varieties, which produce more coffee per hectare.

### Fertilizer Subsidy

The farm price for each agricultural product in Table 3 reflects the price of products in the Government purchasing agency office. None of the agricultural products use subsidized fertilizer. The price of coffee, which is the only agricultural product with a fertilizer subsidy, is set by a complex procedure that reflects international coffee prices, Government monetary policy, etc. The subsidy is determined for coffee grades by the desire to export coffee and the level of coffee stocks, and it is set by FEDECAFE, a large cooperative with Government ties. The subsidy is changed every time a new fertilizer price is set. This price was last changed in May 1984.

### Effect of Government Programs on Crop Prices

The minimum guaranteed prices are shown in Table 3. FEDECAFE also sets the price for purchase of coffee for export. The price of coffee for internal use is set according to difference in quality with regard to this standard for export. Government-guaranteed prices of crops are set by considering average yields per hectare, production costs, etc. Minimum crop prices change twice during the year. They are usually set before the cropping season. The crops on which fertilizers are used are shown in Table 1.

### Cost of Fertilizer Subsidy

The cost of the natural gas paid by the ammonia producers for use as raw material is lower than the current price for industrial use. This lower price, although it does not show up very much in the ammonia price, represents a decrease in income for the Government of US \$996,000 annually. For coffee, the fertilizer subsidy amounts to approximately US \$8 million annually. The cost of this last subsidy is decreasing in real dollars. The fertilizer subsidy for coffee was 8% of the agricultural budget in 1983.



## FERTILIZER SUBSIDIES IN GAMBIA, 1984

by  
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### Historical Fertilizer Use in Gambia

The Government of Gambia has embarked upon the importation of chemical fertilizers in an effort to improve yields and increase agricultural production in Gambia. Total product consumption has ranged between 5,000 and 10,000 mt in recent years. The fertilizer consumption in Gambia for urea, NPK, and single superphosphate for 1971-83 is shown in Table 1. All fertilizer distribution was carried out by personnel of the Department of Agriculture until 1979. Thereafter, the Gambian Cooperative Union assumed the responsibility of distribution. Sales records are difficult to reconcile since some fertilizer was sold directly by the Gambia Produce Marketing Board (GPMB), certain stocks were still on hand at the departmental stores, and no form of reporting has been introduced. Consumption of single superphosphate increased from 1,500 mt in 1971 and through June 1983 reached 5,676 mt. Given the recommended rate of 120 kg/ha, the application of 3,962 mt in 1982 represented only 39% of the fertilizer requirements of the groundnut crop. Use of compound fertilizers (26-14-0) has been quite erratic during the period. In 1983 1,500 mt had been used through June. Only small quantities of urea are used in Gambia.

Table 1. Gambia: Fertilizer Consumption, 1971-83

<u>Year</u>	<u>SSP</u>	<u>NPK</u>	<u>Urea</u>	<u>Total</u>
	----- (mt) -----			
1971	1,500	-	-	1,500
1972	1,653	240	-	1,893
1973	2,250	627	-	2,877
1974	2,714	1,096	-	3,810
1975	3,228	704	-	3,932
1976	4,913	1,708	507	7,128
1977	5,142	3,118	165	8,128
1978	3,463	2,436	16	5,915
1979	5,600	5,000	110	10,710
1980	4,946	5,154	277	10,377
1981	4,875	2,373	156	7,404
1982	3,962	894	118	4,974
1983 <sup>a</sup>	5,676	1,500	-	7,176

a. January-June.

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## Fertilizer Subsidies

Fertilizers have been made available to the farming community at artificially low prices. Fertilizers in Gambia are sold to the farmers at below the cost of Government imports. Fertilizer has always been heavily subsidized in Gambia. Since groundnuts have been the main foreign exchange earner for many years for Gambia, it has been the policy to promote the use of fertilizer to increase groundnut production. Table 2 shows the subsidized fertilizer prices now in effect in Gambia.

Table 2. Gambia: Fertilizer Prices, 1972/73 to 1983/84

Year	SSP		20-20-0 or 26-14-0	
	c.i.f. Price	Subsidized Farm-Gate Price	c.i.f. Price	Farm-Gate Price
----- (dalasis/mt) -----				
1972/73	137.00	90.00	202.00	110.00
1973/74	150.20	90.00	248.00	110.00
1974/75	357.00	90.00	526.00	110.00
1975/76	284.40	106.00	390.80	134.00
1976/77	260.00	106.00	320.00	134.00
1977/78	247.00	106.00	342.00	134.00
1978/79	229.00	106.00	342.40	134.00
1979/80	266.00	106.00	405.00	134.00
1980/81	249.56	106.00	455.20	134.00
1981/82	344.00	106.00	544.00	134.00
1982/83	No imports	160.00	544.00	200.00
1983/84	485.00	213.20	No imports	266.60

Although the fertilizer subsidy may have been based on a rational foundation in the beginning, its continuation is not. The Government felt that it was necessary to subsidize the cost of fertilizer until the beneficial effects were felt and appreciated by the farmers. This objective has largely been achieved, but the continuation of the subsidy may be doing more harm than good to the economy--especially at a time when the country is experiencing a persistent and growing balance of payments deficit. The Government currently subsidizes 61% of the urea price, 62% of the DAP price, and 96% of the single superphosphate price. The fertilizer subsidy is the same for large and small farmers, and the fertilizer prices are the same for all crops for the same fertilizer product. The fertilizer subsidy is changed annually and was last changed in January 1984.

The fertilizer subsidies were being financed by GPMB from its reserves that were built up over the years when profits were being made. The Board could easily afford this in the years of profit, but the experience in recent years has put the Board in a very unfavorable position because its reserves have disappeared

and it is no longer able to finance fertilizer subsidies. Consequently, on the recommendation of the International Monetary Fund, the Gambia Government has agreed to phase out the subsidy. Prices will be as follows as the subsidy is reduced (Table 3):

Table 3. Gambia: Future Fertilizer Prices Agreed to by Government

	<u>1983/84</u>	<u>1984/85</u>	<u>1985/86</u>
	--(dalasis/50 kg)--		
Single superphosphate	10.66	13.32	15.98
Compound 26-14-0	13.33	16.66	19.99
Urea	16.66	20.76	24.86

### Fertilizer Use By Crop

Listed below are the major crops on which fertilizer is used. The major crop in Gambia is groundnuts, which is cropped on an area of about 100,000 ha. Roughly 66% of all fertilizer used in Gambia is used on groundnuts. Another 20% of the fertilizer is applied to maize. Smaller quantities are used for sorghum, millet, and rice (Table 4).

Table 4. Gambia: Fertilizer Use by Crop

<u>Major Crops</u>	<u>Hectares Grown</u> ( '000)	<u>% of all Fertilizer</u> <u>Used on This Crop</u>
Groundnuts	100	66
Sorghum	12	4
Millet (early and late)	20	6
Maize	12	20
Rice (upland)	5	
(irrigated)	2	4
(swamp)	20	

### Economics of Fertilizer Used in the Past

The decision to apply or not apply fertilizer depends largely on its profitability. Profitable fertilizer use depends on the agronomic response and on the fertilizer cost and the crop:price relationship. In Gambia this relationship is very favorable as a result of the Government's policy to promote fertilizer consumption

by keeping fertilizer prices low. Current farm-level prices of major crops and major fertilizer products are shown in Table 5, and some fertilizer and crop price relationships are shown in Table 6.

Table 5. Gambia: Current Prices for Crops and Fertilizer in US \$  
(Exchange rate 1 US \$ = 3.65 dalasis)

<u>Crop<sup>a</sup></u>	<u>Price/kg</u>	<u>Fertilizer<sup>b</sup></u>	<u>Price/50-kg Bag</u>
Rice	0.14	Urea	4.56
Maize	0.10	SSP	2.92
Groundnuts	0.12	26-14-0	3.65

a. Crop prices have been in effect since October 1983.

b. Fertilizer prices have been in effect since January 1984.

Table 6. Gambia: Relationship Between Prices of Selected Crops and Fertilizer

	<u>1972/73</u>	<u>1975/76</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	<u>1983/84<sup>a</sup></u>
	--(dalasis/mt)--					
<u>Groundnuts</u>						
Farm-gate SSP	90.00	106.00	106.00	106.00	160.00	213.20
Produce price	200.00	370.40	460.00	500.00	520.00	450.00
kg to buy 1 kg SSP	0.45	0.29	0.23	0.21	0.31	0.47
<u>Paddy/Rice</u>						
Farm-gate compound	110.00	134.00	134.00	134.00	200.00	266.60
Produce price	154.00	352.00	463.00	510.00	510.00	510.00
kg to buy 1 kg NPK	0.71	0.38	0.29	0.26	0.39	0.52
<u>Maize</u>						
Farm-gate compound				134.00	200.00	266.60
Produce price				480.00	390.00	390.00
kg to buy 1 kg NPK				0.28	0.51	0.68

a. In January 1984, fertilizer prices were changed. However, this would not be reflected in consumption for the 1983/84 cropping season. Groundnuts show a better return according to this data, but maize has shown the greatest response to fertilizer and is becoming one of the crops preferred by many farmers.

NOTE: Compound relates to 20-20-0 until 1980. Compound relates to 26-14-0 for the 1983/84 season.

### Revised Fertilizer Distribution Margins

In accordance with the decision taken by the Cabinet in 1981, the following fertilizer distribution margins were applicable for the fertilizer retail channel:

Table 7. Gambia: Fertilizer Margins

<u>Retailer's Costs</u>	<u>Single Superphosphate</u>	<u>26-14-0</u>	<u>Urea</u>
	----- (dalasis/mt) -----		
Transportation	15.00	15.00	15.00
Handling charges	4.80	4.80	4.80
Capital/credit costs	3.50	4.00	6.70
Storage	2.50	2.50	2.50
Losses/shortages	0.50	0.50	0.50
Administrative costs	2.00	2.00	2.00
Retailer's net margin	19.95	19.70	18.35
Retailer's gross margin	45.25	48.50	49.85

Cost of the Subsidy

The total amount spent on all fertilizer subsidy in 1983/84 in Gambia was US \$601,111. This represents approximately 2% of the agricultural budget. In addition to this amount in the seasons 1982/83 and 1983/84, single superphosphate was supplied partially without cost to the farmer to encourage farmers to store groundnut seed. Approximately US \$135,778 was spent on 3,055 mt in 1982/83 and US \$286,274 in 1983/84 for 4,834 mt. The expenditure on subsidy is expected to increase in 1984/85 compared with that of 1983/84.



## FERTILIZER SUBSIDIES IN INDIA, 1984

by  
Gopal Sohbt<sup>1</sup>

### Fertilizer and Crop Prices

Fertilizer prices in India have two principal objectives:

1. To make fertilizer available to the farmer at stable and reasonable prices so as to encourage agricultural production.
2. To give fertilizer producers a reasonable return on their investments and to encourage increased production and efficient operations.

Current fertilizer and crop prices are shown in Table 1. At present urea sells for Rs 107.50 for a 50-kg bag. A kilogram of rice sells for Rs 1.37. This means that it takes 1.57 kg of rice to buy a kilogram of urea. These prices have been in effect since June 1983. Crop and fertilizer prices effective in July 1981 are shown in Table 2. These latter figures indicate that a kilogram of urea could then be purchased with 2.24 kg of rice. Urea is thus 30% cheaper now in relation to rice than in July 1981. The drop in price of urea per se is, however, only 8.5%. On the other hand, whereas the urea price remained unchanged from July 11, 1981, to June 28, 1983, the rice price increased from Rs 1.05 to Rs 1.22/kg. In June 1983, it took 1.93 kg of rice to buy a kilogram of urea compared with 2.24 kg in July 1981. The drop in the urea price relative to rice is thus only 18.7% compared with that of the previous year.

Each fertilizer has one maximum selling price that is uniform throughout the country. The prices of all fertilizers, except ammonium chloride, are statutorily controlled under the Fertiliser Control Order (FCO). Overcharging of fertilizers is a serious offense under the law. Every sale of fertilizer in India has to be recorded through a receipt indicating the name and location of the purchaser, the quantity purchased, the crops for which it is purchased, and the price paid by the purchaser.

### Current Status of Subsidies

Fertilizer is subsidized in India to keep its price to the farmer at a level at which he considers fertilizer use profitable. The price of fertilizers per se is in fact not very relevant in agriculture. It is the fertilizer and crop price relationship that is

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Table 1. India: Current Farm-Level Prices of Major Crops and Major Fertilizer Products

Crop	Price/kg (Rs)	Fertilizer	Prices Effective
			Since June 29, 1983 Price/50-kg Bag (Rs)
Rice	1.37	Urea (46% N)	107.50
Wheat	1.52	Ammonium sulfate (20.6% N)	75.00
Cotton	3.80	TSP (powder) (46% P <sub>2</sub> O <sub>5</sub> )	110.00
Maize	1.24	Single Superphosphate (powder) (16% P <sub>2</sub> O <sub>5</sub> )	42.50
Groundnuts	2.95	DAP (18-46-0)	167.50
Sugarcane	0.13	KCl (60% K <sub>2</sub> O)	60.00
Gram	2.40	Nitrophosphate (20-20-0)	110.00
Sorghum	1.24		

Note: US \$1.00 = Rs 10.20.

Table 2. India: Previous Crop and Fertilizer Prices

Crop	1981 Price/kg (Rs)	Fertilizer	Prices Effective
			July 11, 1981- June 28, 1983 Price/50-kg Bag (Rs)
Rice	1.05	Urea (46% N)	117.50
Wheat	1.30	Ammonium sulfate (20.6% N)	75.00
Cotton	3.04	TSP (powder) (46% P <sub>2</sub> O <sub>5</sub> )	120.00
Maize	4.05	Single Superphosphate (powder) (16% P <sub>2</sub> O <sub>5</sub> )	47.00
Groundnuts	2.05	DAP (18-46-0)	180.00
Sugarcane (cane)	0.125	KCl (60% K <sub>2</sub> O)	65.00
Gram	1.45	Nitrophosphate (20-20-0)	120.00
Sorghum	1.05		

Note: US \$1.00 = Rs 10.00.

really relevant. A favorable relationship (to the farmer) can be achieved either by keeping the fertilizer price low or by keeping the crop price high. Both these strategies have been adopted by different countries.

The Government of South Korea, for example, has fixed high crop prices, and there is hardly any subsidy on fertilizers. Malaysia and Burma, on the other hand, have kept a very low price for fertilizers. India has adopted a judicious mix of the two

strategies. Fertilizer prices are not very low in India, and at the same time crop prices are not very high. There is, however, an overall subsidy on both fertilizer and food grains.

There is a subsidy even in Japan and South Korea, but it is on food grains rather than on fertilizers. A realistic comparison of the subsidy can be made only by studying the food production and consumption system in its totality, rather than fertilizers in isolation.

The average cost of fertilizer production in India, as in most other countries, is much higher than the price at which fertilizer is sold to the farmer; thus, there is a payment of subsidy. Regarding imports, the subsidy depends on the price of the import compared with the maximum selling price fixed for the farmer. Usually, the import cost is higher than the farmer price, and imports are also subsidized.

In India the fertilizer industry pays a relatively lower price for raw materials, such as natural gas, than do other consumers. However, the sale price of gas in India, even to fertilizer units, is much higher than the price paid for the same quantity of gas by fertilizer manufacturers in other countries.

The price of fertilizers to the farmer is kept low in an attempt to keep the input/output price relationship at a reasonable level. Likewise, the manufacturer's cost of production is reasonably protected through a mechanism of "Retention Pricing System," which is administered by a high-powered committee called the Fertilizer Industry Coordination Committee (FICC). The retention pricing system has a built-in provision of offering incentives for high capacity utilization and penalizing low capacity utilization. Therefore, it encourages efficiency and production in the system. At the same time, the Government fixes crop procurement prices to ensure a reasonable return to the farmer. The distribution of food grains to the general public through a large number of Government-controlled fair price shops, however, is done at reduced prices at which the ordinary consumer is capable of purchasing his requirements. There is, therefore, a judicious mix of price subsidies on both inputs and outputs.

#### Administration of Subsidy Scheme

The method of administration of the fertilizer subsidy scheme varies from country to country. In India it is administered at the manufacturer level for reasons of administrative convenience and to minimize chances of misuse. The number of manufacturers is relatively small, and they have regular accounting systems that can be easily audited for purposes of necessary check to avoid misuse. There are, however, subsidies even at the farmer level, but the quantum of subsidies involved in such cases is relatively very small.

### Subsidy on Other Costs

Domestic transportation is partially subsidized in India by the Government to ensure fertilizer availability on time and in the right quantities even to the remotest corner of the country. Fertilizer credit is also subsidized through cooperatives. In addition, Government undertakes warehousing of imported fertilizer material as buffer stock, and this is tantamount to subsidizing fertilizer marketing costs.

The fertilizer subsidy is generally the same for all crops. The promotion of the use of fertilizers on a particular crop is done through intensive extension and promotion efforts. The fertilizer subsidy is also generally the same throughout India for large and small farmers. Some states, however, offer additional subsidies of 25% and 33.3% to small and marginal farmers, respectively. In addition, the transport of fertilizer to hilly and difficult terrains is further subsidized.

Table 3. India: Fertilizer Use by Crop

<u>Major Crops</u>	<u>Hectares Grown</u> (million)	<u>Percent of All Fertilizer</u> <u>Used on This Crop</u>		
		<u>N</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>
Paddy	37.79	39.3	37.6	50.5
Wheat	23.15	27.6	29.2	15.4
Cotton	8.07	5.7	5.5	4.4
Maize	5.69	2.1	0.6	0.5
Jowar	16.11	1.6	1.2	1.6
Bajra	10.87	1.3	1.4	0.8
Groundnuts	7.35	1.9	5.0	4.5
Sugarcane	3.37	8.4	7.2	7.6
Other Crops	<u>62.60</u>	<u>12.1</u>	<u>12.3</u>	<u>14.7</u>
	175.00	100.0	100.0	100.0

Data provided by the National Council of Applied Economic Research (NCAER) in a major study conducted by that organization during 1975/76.

### Use of Fertilizer by Crops

As is evident from Table 3, 70% of the fertilizer used in India is consumed by food grains and the remaining 30% by cash crops. Likewise, about 70% of the gross cropped area is covered by food-grain crops. Among the major crops, paddy and wheat account for 34.8% of the gross cropped area and consume 66.8% of fertilizers.

## Determining Fertilizer Subsidies

Current fertilizer prices in India have been in force since June 29, 1983. Crop prices are normally revised once a year, in April for wheat and in September/October for rice.

The amount of fertilizer subsidy is determined as follows:

1. Domestic Production  
If the statutorily controlled maximum selling price to the farmer is lower than the "ex-factory retention price plus equated freight to destination plus distribution margins," the difference is termed as subsidy. The retention price varies from manufacturer to manufacturer.
2. Imports  
If the landed cost of imports plus equated freight to destination plus distribution margin is higher than the statutorily controlled maximum selling price to the farmer, the difference represents the subsidy.

The fertilizer subsidy situation is reviewed at specific intervals, with attention to the norms laid down for each item of cost of production. The retention price is reviewed every 2 years, the equated freight is reviewed every year, and the variations in the cost of raw materials are reviewed whenever the change takes place.

## Cost of Subsidies

The cost of subsidies in India has been increasing each year. Table 4 records the cost of subsidies in India to Government during the past 5 years.

Table 4. India: Subsidy on Indigenous and Imported Fertilizers

Year	Indigenous Fertilizers	Freight	Total (Indigenous)	Imported Fertilizers	Total
	----- (US \$ million) -----				
1978/79	172	Negligible	172	171	343
1979/80	292	29	321	282	603
1980/81	121	49	170	335	505
1981/82	182	93	275	90	365
1982/83	429	121	550	50	600
1983/84 (Estimated)	-	-	900	100	1,000

The reasons for the increase in subsidy on fertilizers are as follows:

1. Increase in quantity of production.
2. Reduction in consumer price.
3. Increased production from high-cost production units recently commissioned.
4. Sharp increase in cost of inputs.
5. Increase in distribution margin.
6. Increase in freight.

Fertilizer subsidies in India in 1983/84 are estimated to total about US \$1 billion, which averages US \$128/tonne of nutrient or approximately US \$55/tonne of fertilizer material.

These levels of subsidies in India should be viewed in the context of the environment in which the domestic production takes place. The cost of gas is relatively high, the advantage of which goes to Government. The capital cost of new units is high, and one of the major factors contributing to this is the excessive customs and excise duties and local levies on imported and indigenously produced plant and equipment. All the taxes, duties, and levies account for around 20% of the capital cost.

There is also the requirement of high capital outlay to provide for nonproductive plant facilities; this includes the development of townships and the establishment of other basic infrastructure such as rail and road, communication facilities, and supply of utilities. The fertilizer industry in many other countries does not have to incur these extra-heavy expenses. The fertilizer manufacturers in India are no doubt compensated to a large extent for such costs through the Retention Pricing System but in the form of price subsidy.

Many developing and developed countries may not have price subsidy on fertilizers, but they do have subsidy in one form or another in the agriculture system. The fertilizer price subsidy in India will compare very favorably with that in any country if it is calculated on the same basis.

## FERTILIZER SUBSIDIES IN INDONESIA, 1984

by  
Dr. Entol Soeparman<sup>1</sup> and Dalil Hasan<sup>2</sup>

### Fertilizer Consumption in Indonesia

Indonesia's fertilizer consumption increased dramatically during the first three 5-year plans (1969-83). The increased consumption can be mainly attributed to the following:

1. Rapid development of the indigenous capacity to produce fertilizers.
2. Parallel development of an effective marketing and distribution system.
3. Government intensification programs known as Mass Guidance for Food Production (Bimbingan Massal Swa Sembada Bahan Makanan [BIMAS], Intensifikasi Massal [INMAS]/Intensifikas Khusus [INSUS]).

In 1969 fertilizer consumption was 432,000 mt. By 1983 consumption increased to 3.4 million mt. The fertilizers used in Indonesia are urea, TSP, KCl, and AS. Fertilizer consumption for the years 1969-83 is shown in Table 1.

Fertilizer is used mainly for food crops and estate crops. In 1982 the Central Bureau of Statistics conducted a survey of fertilizer use by crops for the year 1980. The results are given in Table 2. According to the survey, fertilizer consumption for estate crops was only 18% of the total, whereas rice accounted for 59% of the total use. The balance was used on the other major food crops (11%) and for minor crops, such as mungbeans, sorghum, and horticulture (12%).

### Current Status of Fertilizer Subsidies

The fertilizer subsidy is an important input to Indonesia's successful program to attain self-sufficiency in production and other food crops (BIMAS/INSUS), with corresponding increases in rural incomes. The program includes, among other things, extension of credit to the farmers for purchasing inputs such as fertilizer, seed, pesticides, applicators, etc., and a floor price for paddy.

1. Director, Research and Development, P.T. PUSRI, Palembang, Indonesia.

2. Commercial Director, P.T. PUSRI, Palembang, Indonesia.

Table 1. Indonesia: Fertilizer Consumption, 1969-83

Year <sup>a</sup>	Urea	TSP	AS	KCl	Total
	----- ('000 mt of product)-----				
1969	308	49	61	14	432
1970	342	65	76	14	484
1971	413	55	67	4	538
1972	485	39	157	55	736
1973	669	136	65	21	891
1974	604	193	139	16	952
1975	676	235	94	34	1,039
1976	686	211	122	24	1,043
1977	962	183	140	69	1,355
1978	1,080	205	155	109	1,549
1979	1,240	268	196	122	1,825
1980	1,680	439	330	123	2,572
1981	2,021	644	282	148	3,103
1982	2,181	752	335	125	3,393
1983	2,136	739	359	170	3,404
Average increase the last					
15 years (%)	18	16	30	48	

a. Seasonal (dry season plus wet season).

Source: Directorate General of Food Crops, Ministry of Agriculture.

Table 2. Indonesia: The Use of Fertilizer by Crops, 1980

Plant	Fertilizer Dosage (kg/ha)	Harvested Area ('000 ha)	Total Fertilizer ('000 mt)	%
Rice	183	9,005	1,650	59
Corn	77	2,735	210	7
Cassava	19	1,412	26	1
Sweet potatoes	49	276	13	1
Groundnuts	51	506	26	1
Soybeans	38	732	28	1
Estates	-	-	490	18
TOTAL				88
Mungbeans, sorghum, horticulture, etc.			332	12
Actual distribution			2,775	100

The basis for calculation of the subsidy is a controlled retail price for the fertilizer. The fertilizer price and paddy floor price are set at values that yield an acceptable benefit:cost ratio (B:C) for the farmers. In this way, increased food production is encouraged, and the complicated procedure of direct payments to individual farmers is avoided.

In the case of fertilizers, the subsidy is paid in the marketing/distribution system. Responsibility for marketing and distribution of all fertilizers produced or imported in Indonesia has been assigned by the Government to P.T. PUSRI, which is also the largest fertilizer producer. This large and important part of PUSRI's business is conducted on a nonprofit basis, thus facilitating indirect payment of the subsidy at this step in the process of getting the fertilizers into the hands of the end-user, the farmer.

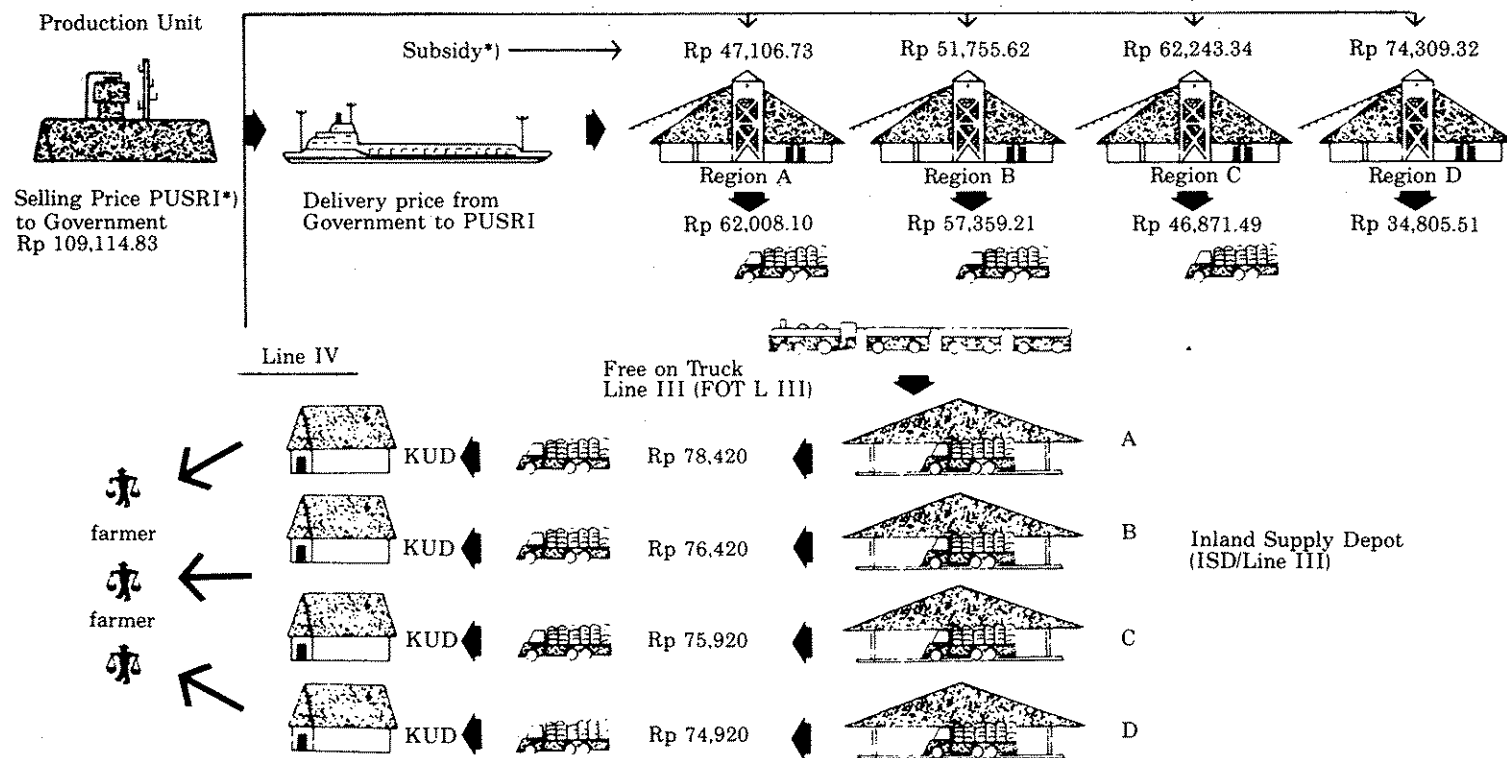
The amount of the subsidy is calculated as the difference between the price of the fertilizers from the producers/importers (selling price to the Government) and the delivery prices from the Government to PUSRI as the sole distributor. Both prices are set by the Minister of Finance.

### The Fertilizer Subsidy

Production/importation, distribution, and marketing of fertilizers in Indonesia constitute essentially a four-level system as shown in Figure 1. The products enter the distribution/marketing system at the provincial level, Line II. At line II, the fertilizers are either bagged for dispatch to Inland Supply Depots (ISDs), Line III, or dispatched directly if already bagged. From here the fertilizers flow to the village retailers, Line IV, who sell directly to the farmers.

To facilitate calculation of the subsidy, the Government divides the country into four regions. The selling price to the Government is determined for each region as the total accumulated costs for production/importation (including margins), handling, shipping, bagging, storage, and loading on conveyance (f.o.t.) at the Line II gate.

The delivery price from the Government to PUSRI f.o.t. at Line II is calculated so that addition of all associated costs for moving the fertilizer from Line II to the farmer will result in the controlled price of Rp 90/kg. The difference between the selling and delivery prices is the subsidy. Table 3 shows a typical example of the subsidy calculation for urea from PUSRI Palembang.



Note \*): Different for each manufacturer or importer.  
 All prices are Rp/metric ton.  
 Current equivalent US \$1 = Rp 1,000.  
 KUD = Koperasi Unit Desa, village cooperative.

Figure 1. Diagram of Indonesia's Fertilizer Distribution and Subsidy Program for Urea (1984).

Table 3. Indonesia: Typical Example of Subsidy Calculation for Urea Ex-PUSRI

Item	Region A <sup>a</sup>	Region B <sup>b</sup>	Region C <sup>c</sup>	Region D <sup>d</sup>
	----- (Rp/mt) -----			
Ex-factory price	109,115	109,115	109,115	109,115
Cost at Line II (delivery price at Line II)	62,008	57,359	46,871	34,806
Subsidy (1 - 2)	47,107	51,756	62,243	74,309
Price to farmers (Rp 90/kg)	90,000	90,000	90,000	90,000
Real retail price	137,107	141,756	152,243	164,309
Percentage (3÷5) of subsidy	34.4%	36.5%	40.9%	45.2%

a. Region A--Java and Bali.

b. Region B--North Sumatra, West Sumatra, Lampung, and Lombok.

c. West Nusa Tenggara (except Lombok), South Sumatra, Aceh, South Sulawesi, North Sulawesi.

d. Region D--Jambi, Bengkulu, Riau, Central Sulawesi, Southeast Sulawesi, Kalimantan, Maluku, East Nusa Tenggara, and Irian Jaya.

Source: Minister of Finance Decree No. 24/KMK.011/1983.

Minister of Finance Decree No. 232/KMK.011/1983.

Calculation of the subsidy for the other domestically produced fertilizers follows the same pattern as for urea, as shown in Table 4.

To maintain the ceiling price for remote locations outside Bali and Java where inland distribution costs are sometimes more than the calculated allowances, the Government further subsidizes the costs from Line III to Line IV.

In November 1982 the Government increased fertilizer prices at the farm level for the first time since 1977 from Rp 70/kg to Rp 90/kg for all types of fertilizers used in the intensification program.

#### Effect of Government Programs on Crop Prices

Minimum crop prices are set by Presidential decree to maintain a B:C ratio of approximately 2.0. In practice, the minimum prices are determined by comparing the increased product (output) with the increased cost (input) if the farmer follows the intensification program. Therefore, the B:C ratio is incremental.

For comparison purposes, controlled prices of urea fertilizer and dried paddy for the years 1975-84 are given in Table 5.

Table 4. Indonesia: Price of Subsidized Fertilizer, 1984

Items	Delivery Price for Distributor at Line II	Cost Line III for Dealer	Cost Line IV for Retailer	Retail Price for Farmer
	----- (Rp/mt) -----			
Urea P.T. PUSRI				
Region A	62,664	78,420	84,000	90,000
Region B	57,991	76,420	84,000	90,000
Region C	47,450	75,920	84,000	90,000
Region D	35,322	74,920	84,000	90,000
Urea P.T. Kujang				
Region A	62,597	78,420	84,000	90,000
TSP P.T. Petrokimia				
Region A	55,188	78,420	84,000	90,000
Region B	58,065	76,420	84,000	90,000
Region C	46,808	75,920	84,000	90,000
Region D	35,225	74,920	84,000	90,000
AS P.T. Petrokimia	60,890	78,420	84,000	90,000

Note:

1. These prices effective as of April 1983.
2. Exchange rate US \$1 = Rp 970.

Source: Minister of Finance Decree No. 24/KMK/011/1983,  
January 11, 1984.

Table 5. Indonesia: Paddy:Urea Price Ratio, 1975-84

Year	Price of Dried Paddy	Price of Urea	Paddy:Urea Ratio
	----- (Rp/kg) -----		
1975	58.5	60	0.98
1976	68.5	80	0.86
1977	71.0	70	1.01
1978	75.0	70	1.07
1979	85.0/95.0	70	1.21/1.36
1980	105.0	70	1.50
1981	120.0	70	1.71
1982	135.0	70	1.93
1983	145.0	90	1.61
1984	165.0	90	1.83

## Cost of Subsidies

Data are not available on the total net cost of the fertilizer subsidies to the Government since they are interrelated to the total BIMAS/INSUS programs.

Simply stated, the overall concept of fertilizer subsidy in Indonesia is to encourage increased agricultural production by delivering fertilizers at a controlled price that is less than the accrued costs of producing the fertilizers and delivering them to the farmers. To accomplish this, the marketing and distribution functions are carried out on a nonprofit basis, and shortfalls in the revenue needed to break even are made up by the Government as a subsidy.

Assuming a constant retail price, it is obvious that the total subsidy will increase from year to year in line with increased consumption and unavoidable increases in the costs of producing and distributing the fertilizers. On the other hand, agricultural production will increase, which has the definite benefit of reducing imports of food and raising farmer incomes (purchasing power) and thereby stimulating growth of Indonesia's entire economy.



## FERTILIZER SUBSIDIES IN IVORY COAST, 1984

by  
D. Collin<sup>1</sup>

### Current and Historical Fertilizer Use and Fertilizer and Crop Prices

During the last 10 years, the general trend of fertilizer consumption in the Ivory Coast has followed the programs of extension for two main cash crops: cotton and sugarcane (Table 1). No future extension is expected on cotton in 1984 because of the suppression of fertilizer subsidies on cotton, even though the buying price has gone up to 100 FCFA/kg (Table 2). The high production cost of sugar has led to the closing of two of the six Government estates in 1984, and we may expect fertilizer consumption to decrease in the near future.

Table 1. Ivory Coast: Historical Trends in Fertilizer Use by  
Main Fertilizer and Crop

	1974/75		1980/81	
	Hectares Grown	Fertilizer Use in Product Tons	Hectares Grown	Fertilizer Use in Product Tons
Cotton	58,676	12,237	126,310	28,165
Sugarcane	3,500	2,975	31,923	19,105
Bananas <sup>a</sup>	-	35,576	-	36,070
Pineapples	-			
Palm trees	69,287	17,945	100,349	16,520
Coconut trees	3,490		30,165	
Total fertilizer <sup>b</sup>		82,769		118,517
Total compound		32,985		64,622
Total urea <sup>c</sup>		10,197		14,406
Total muriate of potash		14,697		16,873

a. Only exported tons are recorded in statistics.

b. Including calciferous fertilizer.

c. The sulfate of ammonia used in 1974 has been "converted" to urea.

1. Société Tropicale d'Engrais et de Produits Chimiques (STEPC), Abidjan, Ivory Coast.

Table 2. Ivory Coast: Change in Farm-Level Crop Prices<sup>a</sup>

<u>Crop</u>	<u>Previous Price (FCFA)</u>	<u>Beginning</u>	<u>End</u>	<u>New Price (FCFA)</u>
Cotton/kg	80	1977	1984	100
Sugarcane	Estate	Production		
Pineapple for cannery/kg	13	1976	1981	15
Pineapple for fresh fruits/kg	- - - - -International Market- - - - -			
Bananas/kg	Supply and Demand Mainly on the French Market			
Palm trees/kg bunch	10	1977	1981	15 <sup>b</sup>
Coconut trees/nut	12		1984	15 <sup>d</sup>
Rubber trees (dry)				160 <sup>d</sup>
Citrus <sup>c</sup>	12	1980	1981	15
Coffee/kg	150	1980	1984	175
Dry berries				
Cocoa/kg	300	1980	1984	350
Dry beans				
Rice (paddy)	50	1980	1982	60
Maize			1984	40

a. Official minimum price started in 1984.

b. Official buying price of copra is 70,000 FCFA/mt to which should be added various bonuses that bring it to 110,000 FCFA/mt.

c. Lemon.

d. Minimum guaranteed price plus a bonus function of the world market price (about 95 FCFA/kg).

Banana and pineapple production has fluctuated according to the climatic conditions and the international market competition.

On palm and coconut trees, in spite of an increase in area during the last 10 years, fertilizer consumption has decreased because of treasury problems. Though cocoa and coffee trees represent a large area and use of fertilizer is highly profitable, their cultivation remains traditional without much use of inputs. During the period considered, there was no change in fertilizer subsidy policy that would explain the production trend.

#### Current Status of Subsidies

Up to the end of 1983, two kinds of subsidies were provided by the Government:

1. By Fertilizer Product--Every compound fertilizer made locally by SIVENG was subsidized for whoever was the buyer. This subsidy was about 60% of the fertilizer price ex-warehouse in Abidjan. Practically, the major crops concerned were (for

technical, sociological... reasons) cotton, food crop, pineapple for cannery and, up to 1982, sugarcane.

2. By Type of Crops--The remaining cost of fertilizer (including storage and transport) was provided by the advisory companies for cotton and irrigated rice growers and indirectly by the Government. The main purpose of this last type of subsidy has been to encourage farmers to use fertilizer on cotton, one of the few possible cash crops in central and northern Ivory Coast and to encourage rice production since rice importation has increased with the migration of population to the towns.

The total amount of subsidies has, of course, increased with the total amount of fertilizer used (Table 3) and with the regularly increasing price of raw materials and urea.

Table 3. Ivory Coast: Total Expenditures on Fertilizer Subsidies

Subsidies ex-factory in Abidjan (million FCFA)

<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
615	658	605	598	660	1,154	2,554	2,489

To these amounts should be added:

The remaining cost and transport for cotton and irrigated rice fertilizers (urea and 10-18-18) which may be estimated at 2,500,000,000 FCFA for 1979/80 agricultural campaign.

The total amount of fertilizer subsidies may thus be estimated at a minimum of 5 billion FCFA or US \$11,900,000 for 1980 (not including single superphosphate), which is about 5% of the agricultural budget (105,332 million FCFA in 1980), including forestry, fishery, and cattle departments.

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US \$1 = 420 FCFA, May 1984.

With the world economic crisis (cocoa and coffee prices on the world market) and also because of the World Bank policy orientation, fertilizer subsidies have been suppressed for the coming agricultural campaign. Meanwhile, the farm-level buying price has been set at 100 FCFA/kg for seed cotton (80 FCFA previously) to maintain the farmer's same average income.

### Government Programs on Crop Prices

The farm-level price is guaranteed for the following: cash crops--cotton, palm bunches, coconuts, pineapples for cannery, latex, citrus, coffee, and cocoa.

A minimum buying price is established for food crops such as maize and rice, whereas prices of bananas and fresh pineapples fluctuate according to the export market.

Appendix Table 1. Ivory Coast: Major Crops or Groups of Crops Produced and Percentage of Total Fertilizer Applied to Each Crop, 1980/81

<u>Major Crops</u>	<u>Hectares Grown</u>	<u>% of All Fertilizer Used on This Crop<sup>a</sup></u>
Cotton	126,310	23.8
Sugarcane	31,923 <sup>b</sup>	22.8
Pineapples for cannery	8,250 <sup>b</sup>	6.2
Pineapples for fresh fruits	7,000 <sup>c</sup>	5.6
Bananas	10,000	18.7
Palm trees and coconut trees	100,349 <sup>d</sup> 30,165 <sup>e</sup>	13.9
Rubber trees	39,877 <sup>f</sup>	1.8
Citrus trees	2,500	1
Coffee and cocoa trees	951,000 1,076,000	1.4
Vegetables	2,800	-
Rice	461,000	2.7
Maize	600,000	1.5
Soybeans	2,000	0.3
		99.7

- 
- a. Including calciferous fertilizers.  
b. Planted area, 2,750 ha harvested.  
c. Planted area, 2,500 ha harvested.  
d. Planted area, 88,134 ha harvested.  
e. Planted area, 11,112 ha harvested.  
f. Planted area, 16,159 ha tapped.

Appendix Table 2. Ivory Coast: Current Farm-Level Prices of Major Crops and Fertilizer Products, 1980/81

Crop	Price/kg (FCFA)	Fertilizers	Fertilizer Price/ 50-kg Bag (FCFA)
Cotton	80	Urea	0
Sugarcane	100 <sup>a</sup>	10-18-18-1 B <sub>2</sub> O <sub>3</sub>	0
	250 <sup>b</sup>	14-7-14	2,850
Pineapples for cannery	13	8-4-20-4MgO <sup>c</sup>	2,275
Pineapples for fresh fruits	80	Urea	3,750
		Potassium sulfate	3,750
		8-4-20-4MgO	2,275
Bananas	54.5 <sup>d</sup>	Urea	3,750
		Potassium chloride	2,950
Palm trees and coconut trees	10 FCFA/bunch	Potassium chloride	0
	7 FCFA/nut	Urea	0
Rice (irrigated)	50	10-18-18	0
Maize	No guaranteed price	Urea	Estimate 4,000 <sup>e</sup>
		10-18-18	

a. World market.

b. Average price fixed for internal consumption.

c. Major fertilizer especially used by small farmers.

d. Average wharf level.

e. Average difficult to estimate for the whole territory.

Appendix Table 3. Ivory Coast: Change in Major Fertilizer Prices (ex-Warehouse Abidjan)

Fertilizer	1978/79	1979/80	1980/81	1981/82
	-(FCFA/mt)-			
Urea	57,900	58,830	73,080	88,200
Phosphate rock		43,560	46,080	55,890
Potassium chloride	35,800	42,750	54,850	60,900
Potassium sulfate	52,050	61,450	71,600	81,860
10-18-18 + B <sub>2</sub> O <sub>3</sub>	- - - -	unchanged since 1974		48,000 <sup>a</sup>
14-7-14	- - - -	unchanged since 1974		42,000 <sup>a</sup>
8-4-20-4MgO	- - - -	unchanged since 1974		41,500 <sup>a</sup>

a. Importation price without subsidy may be between 100,000 and 110,000 FCFA/mt.

## FERTILIZER SUBSIDIES IN NEPAL, 1984

by  
Hera Kaji Shakya<sup>1</sup> and Anil Prasad Pradhan<sup>2</sup>

Chemical fertilizer was not used in Nepal until the mid-1960s. It was first introduced in 1964/65 by some private traders but was officially introduced only in 1965/66 with some 3,169 mt received under an aid program. Total sales that year were 2,096 mt. The use of fertilizer was limited to the Kathmandu Valley until the Agriculture Supply Corporation (now Agriculture Inputs Corporation [AIC]) was begun in February 1965 as a parastatal corporation in the public sector. Since then, the marketing of chemical fertilizer and other related inputs has become the main objective of the Corporation.

Chemical fertilizer has been a major agricultural input in most of the Kingdom, and its distribution is handled primarily through cooperatives and some private dealers. In the fiscal year 1982/83 the annual sales exceeded 73,000 mt; complex fertilizers accounted for 46% of this total and urea and AS for the remainder (Table 1).

Table 1 indicates that consumption of fertilizer has been increasing steadily. In 1971/72, a total of 25,434 mt of fertilizer products was sold in the country. In 1981/82 the consumption increased to 56,447 mt. During this decade the consumption of fertilizer more than doubled. A review of the consumption trend in the past 6 years (1977/78 to 1982/83) as shown in Table 1 indicates that there has been a positive growth in the annual fertilizer offtake.

Until 1973/74 there was no policy decision on fertilizer prices. AIC fixed the prices of fertilizer on the basis of actual cost plus marketing charges before 1973/74, when the Government made certain policy decisions to cope with the soaring prices of fertilizer caused by the energy crisis. Since that time, the price has been fixed by the Government and has become uniform in the kingdom.

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Note: Additional references used include: "Fertilizer Marketing in Asia," C. Y. Lee; "Import and Physical Distribution Management of Fertilizer in Nepal," S. S. Rawal and A. M. Tamrakar; "Fertilizer Price Subsidy and Promotion Policies in Nepal," Dr. T. N. Pant.

Table 1. Nepal: Consumption of Fertilizer by Product From 1965/66 to 1982/83

Fertilizer Fiscal Year	21-0-0	46-0-0	0-48-0	0-22-0	0-0-60	20-20-0	23-23-0	18-46-0	15-15-15	Others	Total	Percent Change
	----- (mt) -----											
1965/66	1,629	-	-	450	17	-	-	-	-	-	2,096	
1966/67	4,000	-	33	155	173	1,150	-	-	-	-	5,511	+163
1967/68	5,664	-	127	36	257	3,042	-	-	-	833	9,959	+ 81
1968/69	7,510	461	27	248	187	2,668	-	-	-	510	11,611	+ 17
1969/70	10,133	547	11	138	214	4,572	-	-	13	270	15,898	+ 37
1970/71	9,929	2,125	10	168	242	4,558	-	-	-	696	17,728	+ 12
1971/72	12,295	2,346	4	155	703	9,203	-	-	-	728	25,434	+ 43
1972/73	17,005	5,080	2	198	1,176	9,024	-	-	-	90	32,575	+ 28
1973/74	16,957	6,541	-	64	983	12,127	-	-	184	23	36,779	+ 43
1974/75	13,440	7,165	-	26	1,323	14,056	-	-	215	136	36,361	- 2
1975/76	6,507	10,060	135	-	889	8,332	-	-	5,054	154	31,131	- 14
1976/77	7,755	13,661	72	-	935	9,423	-	-	5,651	338	37,835	+ 22
1977/78	10,410	16,290	105	-	930	14,253	-	-	3,205	89	45,282	+ 20
1978/79	7,376	19,789	524	-	794	10,649	-	-	6,394	65	45,591	+ 1
1979/80	5,060	22,324	317	-	735	14,718	-	-	4,803	2,211	50,168	+ 10
1980/81	4,079	23,554	61	-	654	23,710	622	-	1,241	79	54,000	+ 8
1981/82	5,217	26,693	201	-	995	19,892	907	1,328	1,153	61	56,447	+ 5
1982/83	3,559	32,201	32	-	1,538	33,747	2,084	438	82	49	73,730	+ 31

The fixed price of 1973/74 was changed in 1975/76. But this price was in effect only 3 months, from September 18 to December 8, 1975, because it was revised by the Government under the twenty-point program. The price was below the cost, which caused AIC a great loss of Rs 142.67 million during 1975/76-1979/80. Thus, the Government made revisions in 1980/81, which to some extent helped AIC even though the loss reached Rs 52.79 million in 1981/82. The Government again revised the price in 1982/83, and it is still in effect. Prices are shown in Table 2.

Table 2. Nepal: Fertilizer Prices, 1972/73-1982/83

Year	Ammonium Sulfate	Urea	Complex (20-20-0)	Potash	Compound (15-15-15)	DAP (18-46-0)
	(Nrs/mt)					
1972/73	1,000	1,535	1,556	895	-	-
1973/74	1,658	2,192	2,214	1,552	-	-
1974/75	1,658	2,192	2,219	1,552	-	-
1975/76 <sup>a</sup>	2,200	3,050	2,670	1,850	-	-
1975/76 <sup>b</sup>	1,870	2,440	2,270	1,572	-	-
1976/77	1,870	2,440	2,270	1,572	-	-
1977/78	1,870	2,440	2,270	1,572	-	-
1978/79	1,870	2,440	2,270	1,572	-	-
1979/80	1,870	2,440	2,270	1,572	-	-
1980/81 <sup>c</sup>	2,400	3,100	2,800	1,572	2,740	4,500
1981/82	2,400	3,100	2,800	1,572	2,740	4,500
1982/83 <sup>d</sup>	2,400	3,500	3,250	1,572	3,200	4,500

a. Effective from September 19, 1975.

b. Effective from December 8, 1975.

c. Effective from November 11, 1980.

d. Effective from April 18, 1983.

Exchange rate October 1984 US \$1 = 17.60 Nrs

Average fertilizer use in Nepal is about 28 kg/ha, which is one of the lowest in the world. The greatest consumption per hectare, or about 25% of total fertilizer sales, is in the Kathmandu Valley, which comprises only 2% of the total cultivated land of the country. The Tarai covers half of the cultivated land and consumes half of the total sales. The hills of Nepal cover nearly 32% of the country's cropped land but consume only one-fourth of the fertilizer (Table 3).

Table 3. Nepal: Cropped Area and the Fertilizer Use in Different Ecological Regions, 1982/83

<u>Ecological Region</u>	<u>Cropped Area</u>	<u>Fertilizer Use</u>
	- - - - - % - - - - -	
Hills	32	25
Kathmandu Valley	2	25
Tarai	<u>66</u>	<u>50</u>
	100	100

Fertilizer in Nepal is mainly used on winter crops; wheat is the major crop, followed by vegetables and such cash crops as sugarcane, mustard seeds, and tobacco. In the summer, paddy is the major crop, and jute, tea, and horticultural crops are some overlapping crops that consume fertilizer sold during the summer. The cropwise consumption of fertilizer in the year 1982/83 is estimated in Table 4.

Table 4. Nepal: Estimated Cropwise Consumption Based on Monthly Sales in 1982/83

<u>Crops</u>	<u>Total Area Under Cultivation</u> ( <u>'000 ha</u> )	<u>Estimated Fertilizer Use</u> ( <u>'000 mt</u> )	<u>Use</u> ( <u>kg/ha</u> )
Paddy	1,265	23	18.2
Wheat	506	27	53.4
Maize	511	6	11.7
Vegetables	59	4	67.8
Cash crops and others	<u>273</u>	<u>13</u>	<u>47.6</u>
TOTAL	2,614	73	27.9

Subsidy is a burden to the Government even if it benefits the farmer in the process of food-grain cultivation. Although the use of chemical fertilizer provides indirect benefits for increased national production, it has been a headache to the corporation because the subsidized money is still due from the Government.

There are two prevailing subsidies in Nepal: price and transportation. The fertilizer cost is higher than the Government-fixed selling price. AIC has to sell below cost to encourage farmers to buy fertilizer. This causes a great loss to AIC, which is refunded by the Government as subsidy.

The purpose of subsidy is to lower the costs to farmers. The import price of fertilizer is high. Because there is no domestic

production, Nepal has to depend totally on grants and loans along with its own procurement. High-cost fertilizer is of no use to the poor farmers of Nepal; thus, it has been subsidized to enable a farmer to afford fertilizer.

More than half of the arable land is in the hills. Because the hills of Nepal lack transportation facilities, transportation costs are high. Thus, the Government has subsidized the transportation cost to remote hill centers to reduce the cost of fertilizer.

The procurement price of urea and complex fertilizer, c.i.f. Calcutta, was NRs 2751/mt each in 1982/83. The clearing and forwarding charges from Calcutta to the Nepal-India border in the same lot was NRs 625, which is to be added to the c.i.f. price. To reach the farmer's door it must be transported to different parts of the country. Thus, the internal transportation and marketing charges of about NRs 1,384/mt must be added to the above charges to reach the total cost of NRs 4,760/mt. The farmer, thus, would have to pay NRs 4.76/kg of urea or complex fertilizer if the selling price equaled cost. However, the Government of Nepal has fixed the price of urea and complex fertilizer at a price of NRs 3.25 and NRs 3.50/kg, respectively. A loss of NRs 1.51 and 1.26/kg to the corporation results. This loss is supposed to be compensated by the Government as price subsidy. Fertilizer subsidy is set on the basis of the differences between the price fixed by the Government and the price fixed on the above basis. Only in fiscal year 1982/83 did the Government make a special budgetary provision for the fertilizer subsidy.

The purpose of fertilizer subsidy is to encourage its use and to assist the farmers in the development of agriculture. The uneducated farmers of Nepal follow a primitive type of cultivation. Until and unless they are shown the economic benefit, they do not follow modern technology. So it becomes very necessary to give them an economic benefit; thus, the Government has to subsidize the fertilizer.

Paddy, wheat, maize, and potatoes are the main agricultural products of Nepal. The contribution of agricultural products to the gross domestic product (GDP) of Nepal has been estimated at 62%. The prices of the above major agricultural products in the months of May and June 1984 are as follows:

Paddy	NRs 2.93/kg
Wheat	NRs 2.84/kg
Maize	NRs 3.06/kg
Potatoes	NRs 2.28/kg

The determination of subsidy is made by the Government on the basis of the agricultural production target and is also fixed by the Government, Planning Commission and Agriculture Ministry. The Government sets the target of all the agricultural products and determines the need for fertilizer subsidy for a particular product. This is what AIC has to fulfill in a particular year.

The subsidy to be received by AIC is on the basis of the Government's target in different districts, which is the decision of District Agriculture Offices, farmer representatives, and AIC.

Subsidy changes every year in accordance with the change in the quantity of sales. In 1972/73 the total subsidy was NRs 1.2 million, which increased to NRs 22.96 million in 1982/83.

The Government also fixes the minimum support prices for important agricultural products such as paddy and wheat on the basis of the cost of production and the prevailing market prices across the border in India. Until the mid-1970s the market price used to be lower than the support price. In recent years the trend has reversed. The scheme of the minimum support price has not been quite effective because the Government does not yet have an extensive procurement network to buy the produce from the interior rural areas. The Nepal Food Corporation is involved in the procurement of food grains, especially for distribution in the deficit areas. Table 5 shows the support price for paddy, the fertilizer prices in previous years, and the paddy:urea price ratio. Only paddy and urea are considered here because of their relative importance. From the table it can be seen that the paddy:urea ratio remained constant at 0.46 through 1981/82. The ratio improved to 0.57 until 1983 because of a rise in support price without a corresponding increase in the price of urea. It subsequently decreased to 0.51 with the increase in the price of urea (Table 5).

Table 5. Nepal: Paddy and Urea Prices

<u>Year</u>	<u>Support Price for Paddy</u>	<u>Retail Price of Urea</u>	<u>Ratio</u>
	- - - - - (NRs/100 kg) - - - - -		
1977/78	112.50	244	0.46
1978/79	112.50	244	0.46
1979/80	-	244	-
1980/81	142.59	310	0.46
1981/82	142.59	310	0.46
1982/83	178.00	310	0.57
1983/84 <sup>a</sup>	178.00	350	0.51

a. Effective April 10, 1983.

The Government of Nepal provides subsidy on fertilizer. The total subsidy on price and transport from 1970/71 to 1982/83 totaled NRs 821.87 million and NRs 59.724 million, respectively (Tables 6 and 7).

The amount of total subsidy increases as the quantity of fertilizer distributed increases. The subsidy on fertilizer in 1970/71 was NRs 6.59 million (Table 6) and rose to NRs 21.90 million in 1972/73 and to NRs 135.13 million in 1974/75. In 1975/76, the

Government increased the price of fertilizer, which reduced the cost of subsidy. But it was a matter of short relief. The subsidy increased again because of the increase in the cost price. It reached NRs 138.50 in 1979/80, and the Government was again compelled to increase the price of fertilizer in 1980/81.

Table 6. Nepal: Total Fertilizer Subsidy and Fertilizer Consumption, 1970/71-1982/83

<u>Fiscal Year</u>	<u>Quantity Consumed</u> ( '000 mt)	<u>Total Subsidy</u> (Million NRs)
1970/71	17.73	6.59
1971/72	25.43	4.85
1972/73	32.05	21.90
1973/74	36.78	90.76
1974/75	36.39	135.13
1975/76	31.13	124.43
1976/77	37.84	41.77
1977/78	45.23	64.46
1978/79	45.59	60.67
1979/80	50.29	138.50
1980/81	54.00	57.06
1981/82	56.45	52.79
1982/83	73.73	22.96
TOTAL		821.87

The hills and mountains of Nepal lack adequate transportation facilities. The main medium of transport is porter, which is very costly. This transportation cost makes fertilizer expensive, and the farmers of Nepal are not able to pay. Thus, transport subsidy is provided by the Government so that the Corporation can supply fertilizer to the different regions of the Kingdom at the Government-fixed price. Table 7 shows the transport subsidy in different regions in different years.

Table 7. Nepal: Transport Subsidy for the Supply of Fertilizers and Seeds in the Hills

<u>Year</u>	<u>Amount</u>	<u>Subsidy in Different Regions</u>			
		<u>Eastern</u>	<u>Central</u>	<u>Western</u>	<u>Far-Western</u>
- - - - - ('000 NRs) - - - - -					
1971/72	1,200	NA	NA	NA	NA
1972/73	1,550	NA	NA	NA	NA
1973/74	1,545	NA	NA	NA	NA
1974/75	2,100	NA	NA	NA	NA
1975/76	2,900	NA	NA	NA	NA
1976/77	3,200	1,088	287	860	954
1977/78	2,600	1,114	423	1,956	1,601
1978/79	5,139	1,199	428	1,715	1,797
1979/80 <sup>a</sup>	5,100	1,130	413	1,956	1,801
1980/81	9,800	1,853	912	3,138	3,897
1981/82	11,250	2,700	1,050	3,450	4,050
1982/83	<u>13,340</u>	<u>3,060</u>	<u>1,185</u>	<u>3,056</u>	<u>6,039</u>
TOTAL	59,724	NA	NA	NA	NA

a. Include NRs 1 million for special wheat production program.

## FERTILIZER SUBSIDIES IN THE PHILIPPINES, 1984

by  
Ma. Teresa D. Ingles<sup>1</sup>

### Current and Historical Fertilizer Use

Over the past 10 years (1974-83), fertilizer consumption has been growing at a relatively steady 3% annual pace with the exception of 1975 when consumption declined by 22% (Table 1). This decline was brought about by drastic increases in the domestic ceiling prices of fertilizer and the overstocking of fertilizer in 1974 due to the oil crisis.

Fertilizer consumption data represent predominantly nitrogenous fertilizers--urea and ammonium sulfate--and complete (NPK) fertilizer since these have been the major grades required for the country's rice program launched in 1973.

Consumption of nitrogen in relation to phosphorus and potassium has been growing through these years. The ratio was 2.9-0.8-1.0 in 1974 and had increased to 3.8-0.8-1.0 by 1983 (Table 2).

The breakdown of fertilizer use by crop is shown below:

Rice	44%
Corn	5%
Sugar	37%
Banana, pineapple	6%
Others	8%

### Fertilizer Supply

Due to the increasingly uncompetitive costs of local manufacturing plants, the country has through the years become largely dependent on imports to supply the bulk of its fertilizer requirements (Table 3). In 1983 imports accounted for 73% of fertilizer supply with the balance covered by the production of only two plants--Planters Products and Atlas Fertilizer--operating at only 50% of their capacity. The country's two other plants have been shut down since 1977.

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Table 1. Philippines: Historical Consumption of Fertilizers by Product

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
	----- ('000 mt) -----									
Urea	212.2	143.8	174.8	229.3	287.1	320.4	329.2	307.3	342.0	371.5
Ammonium sulfate	200.5	167.5	185.4	177.7	171.2	175.4	143.6	126.5	140.3	137.7
NP and P	130.7	105.5	116.0	106.1	125.3	124.2	131.8	124.2	143.1	145.2
NPK	126.9	102.1	108.0	124.1	147.2	159.5	158.2	163.7	161.6	150.5
Potash	<u>68.0</u>	<u>58.7</u>	<u>59.7</u>	<u>48.4</u>	<u>60.8</u>	<u>59.8</u>	<u>56.8</u>	<u>63.7</u>	<u>58.8</u>	<u>73.4</u>
Total consumption	738.3	577.6	643.9	685.6	791.6	848.7	819.6	785.4	845.8	878.0

Table 2. Philippines: Historical Consumption of Fertilizer According to Nutrient

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
	- - - - - ('000 mt) - - - - -									
N	177.5	138.8	152.4	174.2	205.4	276.7	224.8	209.9	233.0	244.2
P	47.7	38.6	38.3	40.4	49.8	51.9	53.4	51.2	56.0	54.8
K	60.0	49.7	55.1	45.9	56.4	63.7	55.8	60.6	57.0	64.5

However, with recent changes in the country's foreign exchange rate, which now averages ₱18.00 to US \$1.00 compared with ₱7.40 to US \$1.00 five years ago, the Government has taken drastic steps to minimize the country's dependence on imported chemical fertilizer. The Philippines' first phosphate fertilizer plant is scheduled to be fully operational by year's end and is designed to effectively compete with prices in the world market. The plant has a capacity of 1 million mt of which 700,000 mt is intended for exports, and the balance of 300,000 is expected to replace about 50% of our fertilizer imports in 1985.

A complementary program using azolla and other organic fertilizers is also under review.

#### Fertilizer and Crop Prices

The price of fertilizer to farmers has been continuously under price controls since 1973 to assure farmers of reasonable input costs. At the same time, a price support program for rice and corn is implemented to assure farmers an equitable return on their investment.

In the case of fertilizer, these controlled prices were embodied in the Fertilizer and Pesticide Authority's list of ex-warehouse prices, which indicated the ceiling prices at which each fertilizer grade should be purchased ex-warehouse. The farm-gate crop prices, on the other hand, were dictated by the Government's support prices, which theoretically through the Government's procurement interventions could increase actual farm-gate prices to levels that were beneficial to farmers.

As shown in Table 4, ex-warehouse prices of fertilizer have been adjusted annually by an average of 8% basically to cover increased input cost arising from escalations in the world market prices. Recently, however, the adjustments were made to cover changes in the country's foreign exchange rate. Actual farm-gate crop prices, on the other hand, have been depressed through these years compared with the Government's support price levels (Table 5).

Table 3. Philippines: Historical Supply of Fertilizer

<u>Supply</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
	- (1000 mt) -									
<u>Production</u>										
Urea	11.4	23.8	14.1	-	-	-	-	-	-	-
Ammonium sulfate	74.7	96.2	104.7	82.6	61.0	5.0	3.9	31.5	1.3	7.4
NP and P	188.9	108.3	88.8	108.1	74.3	114.7	85.8	92.7	24.0	36.4
NPK	22.0	65.4	98.6	62.3	154.4	114.0	140.3	140.1	100.5	120.5
Total production	297.0	293.7	306.2	248.0	289.7	233.7	230.0	264.3	125.8	164.3
<u>Importation</u>										
Urea	327.7	83.9	83.1	257.6	337.4	355.5	386.9	204.2	365.0	320.2
Ammonium sulfate	238.7	24.1	35.3	119.6	103.2	195.4	167.5	45.1	151.5	118.4
NP and P	62.3	22.6	-	-	16.8	23.9	38.5	41.7	94.6	72.9
NPK	231.2	25.4	-	-	3.0	53.9	23.3	18.6	43.6	27.3
Potash	<u>96.6</u>	<u>72.6</u>	<u>74.6</u>	<u>70.9</u>	<u>89.5</u>	<u>105.9</u>	<u>135.8</u>	<u>117.3</u>	<u>110.7</u>	<u>74.6</u>
Total importation	956.5	228.6	193.0	448.1	549.9	734.6	752.0	426.9	765.4	613.4
TOTAL SUPPLY	1,253.5	522.3	499.2	696.1	839.6	968.3	982.0	691.2	891.2	777.7

Table 4. Philippines: Average Fertilizer Prices of Major Grades

	Ammonium				
	Urea	Sulfate	16-20-0 (₱/kg)	14-14-14	0-0-60
1974	5.23	2.78	3.89	3.83	2.14
1975	3.36	1.86	2.65	2.46	2.48
1976	2.98	1.84	2.58	2.38	2.06
1977	2.98	1.84	2.58	2.38	2.06
1978	2.98	1.84	2.58	2.38	2.06
1979	3.53	2.52	3.32	3.06	2.48
1980	3.97	2.92	3.76	3.47	3.70
1981	4.73	3.49	4.43	4.09	4.20
1982	4.61	3.33	4.43	4.49	4.00
1983	5.48	3.90	5.41	5.40	3.54
Average annual growth rate	8.2	7.6	10.3	15.8	17.0

Table 5. Philippines: Average Farm-Gate and Support Price for Paddy Rice and Corn

	Paddy Rice				White Corn			
	Average Farm- Gate	Average Support	Difference	Difference (%)	Average Farm- Gate	Average Support	Difference	Difference (%)
1974	0.94	0.83	0.11	13	0.93	0.63	0.30	48
1975	.98	1.00	-.02	-2	.94	.82	.12	15
1976	1.04	1.06	-.02	-2	.97	.87	.10	11
1977	1.00	1.10	-.10	-9	1.01	.90	.11	12
1978	.98	1.10	-.12	-11	.97	.90	.07	8
1979	1.04	1.30	-.26	-20	.97	1.01	-.04	-4
1980	1.14	1.36	-.22	-16	1.07	1.06	.01	1
1981	1.30	1.51	-.21	-14	1.18	1.25	-.07	-6
1982	1.36	1.65	-.29	-18	1.25	1.32	-.07	-5
1983	1.52	1.78	-.26	-15	1.35	1.42	-.07	-5

### Fertilizer Subsidy

#### Purpose

As a support of the country's agricultural program, the Government through the Fertilizer and Pesticide Authority instituted the fertilizer subsidy to cushion farmers from the full

impact of abnormal increases in fertilizer cost that were closely related to world price changes. As a secondary purpose, this is undertaken to ensure a continuous supply of fertilizer by guaranteeing the viability and continued existence of the fertilizer industry.

### Concept

From 1973 to 1982, fertilizer subsidies were implemented in the form of tax exemptions on imported finished fertilizer and raw materials as well as direct cash subsidies. The tax-exemption privileges, which are enjoyed up to the present, allow for the importation of finished fertilizer and raw materials to be exempt from payment of all custom duties and taxes. Although this has cost the Government P3.5 billion from 1973 up to the present, it has allowed for a saving of about 20%-30% on the landed cost of fertilizer.

The direct cash subsidy, which was started in 1973 and abolished in 1982, was implemented through a reimbursement scheme whereby the Government paid the fertilizer companies for losses incurred in the distribution of fertilizer at the price-controlled levels. The full cost of the company plus a guaranteed markup of 5% and 2% on the cost of local and imported fertilizer, respectively, was allowed under the reimbursement scheme.

For the first 3 years of the subsidy's implementation, a two-tiered pricing scheme was implemented whereby a low subsidized price for fertilizer was provided for Priority I crops, namely, rice, corn, feed grains, and vegetables. A higher price was given to Priority II crops--sugar, bananas, pineapple, fishpond, etc. Through this mechanism, food-crop farmers were cushioned by as much as 40% of the actual cost of fertilizer. But because of rampant blackmarketing (diversion of fertilizer for Priority I crops to Priority II crops), the two-tiered pricing scheme had to be abandoned in 1976.

In 1979 no direct cash subsidies were required because of favorable market prices. However, in 1980 the subsidy had to be reinstated because of spiraling increases in world market prices. By this time, the subsidy had hit a record high of P550 million, and since this was already too costly for the Government the subsidy was abolished in mid-1982. This was timely because world market prices were beginning to return to normal levels.

From 1973 to May 1982, the direct cash subsidy cost the Government over P1.99 billion (Table 6). The subsidy, though, is not obtained from the general budget for agriculture but from the Social Pricing and Development Adjustment Fund.

Table 6. Philippines: Direct  
Cash Subsidies

	<u>₱ Million</u>
1974	68.4
1975	332.7
1976	108.3
1977	55.2
1978	117.0
1979	15.0
1980	270.0
1981	551.0
1982	473.4
1983	0

### Setting of Fertilizer Prices and Corresponding Subsidies

In setting the domestic ceiling prices of fertilizer, the Fertilizer and Pesticide Authority and the Ministry of Agriculture take into account the effects that increases of fertilizer prices would have on the production cost of paddy rice and corn. These increases are analyzed together with adjustment in other input costs such as labor, pesticide, and transport in setting the Government's support price for paddy rice and corn at a level where farmers are guaranteed a reasonable return. The ceiling prices for rice and corn, which are subsequently established, are reviewed to determine their impact on the consumer's budget and their inflationary effect on the economy. If the adjustments are too high, a price level acceptable to the consumer is adopted. The difference between the recommended cost adjustments for fertilizer prices and the approved price ceilings is borne by the Government subsidy.

All domestic ceiling prices of fertilizer and support ceiling prices of rice and corn are established by the Government after a series of meetings with the private sector. The adjusted prices are always published in major newspapers.

### Procedure of Reimbursement

Under the subsidy guidelines of the Fertilizer and Pesticide Authority, the fertilizer companies are immediately paid 80% of their claims upon filing with the agency. The balance is withheld until a Government audit is completed on the operations of fertilizer companies to determine whether some expenses are legally chargeable against the subsidy. The remaining 20% is released only after the Government's Commission on Audit endorses the claims. In mid-1981, the portion allowable for release was reduced from 80% to 73% because of disallowances on past subsidy claims.

Because of considerable delays in auditing due to the voluminous accounts of each company, the remaining 20% of subsidy claims has not been paid to this date. Fertilizer companies have therefore had to obtain additional loans to finance their operations.

Effect of Fertilizer Subsidy on Production Cost of Rice

In 1981 when the direct cash subsidy hit a record high of about ₱550.0 million, the subsidies on the five major fertilizer grades were as follows:

<u>Grade</u>	<u>Subsidy/50-kg Bag</u> (₱)	<u>Subsidy as % of</u> <u>Selling Price</u>
Urea	36.00	30
Ammonium sulfate	9.50	10
14-14-14	34.70	34
16-20-0	34.00	31
0-0-60	1.20	1

For the locally manufactured grades of 16-20-0 and 14-14-14, the subsidy per metric ton was about double the subsidy for imported grades particularly in 1982 when world prices of the locally manufactured grades dropped to about \$150/mt.

Table 7 presents a comparative picture of the production cost of paddy rice, assuming the use of subsidized fertilizer versus unsubsidized fertilizer. Assuming all other costs remain constant, the production costs would have been higher by ₱108.00/ha or 4% of total cost. This is a national average cost of paddy rice, which is not indicative of farmers who apply higher fertilizer dosage and in effect enjoy a higher subsidy.

Table 7. Philippines: Average Production Cost of Paddy Rice, 1981

	<u>With Subsidy</u>	<u>Without Subsidy</u>
	- - - - - (₱/ha) - - - - -	
<u>Production Cost</u>	2,698	2,806
Labor	1,372	1,523
Seeds	100	100
Fertilizer	360	468
Chemical	116	116
Land rent	361	361
Irrigation fee	80	80
Interest on loan	84	84
Depreciation	180	180
Others	45	45

## FERTILIZER SUBSIDIES IN SAUDI ARABIA, 1984

by  
Syed Abu Khalid<sup>1</sup>

### Current and Historical Fertilizer Use and Fertilizer and Crop Prices

The use of fertilizers on a significant scale in the Kingdom of Saudi Arabia is only of recent origin. During the last 10 years, the total consumption of fertilizer nutrients (N+P<sub>2</sub>O<sub>5</sub>+K<sub>2</sub>O) increased from a meager 7,457 mt in 1973/74 to 100,780 mt in 1982/83, which was an annual growth rate of 33.6%. The demand for various types of fertilizers has continued to increase. Table 1 shows the product-wise nutrient consumption for the period 1978/79-1982/83.

Table 1. Saudi Arabia: Total Nutrient Consumption, 1978/79-1982/83

	<u>N</u>	<u>P<sub>2</sub>O<sub>5</sub></u>	<u>K<sub>2</sub>O</u>	<u>Total</u>
	----- (mt) -----			-----
1978/79	12,053	5,787	255	18,095
1979/80	16,286	5,559	379	22,224
1980/81	22,799	14,357	1,440	38,596
1981/82	41,473	23,614	2,255	67,342
1982/83	65,414	33,150	2,215	100,779
Average % growth per year	52.6	54.7	71.6	53.6

The prices of fertilizers in the Kingdom are not controlled by the Government. The imported products are sold in the market in line with the international prices prevailing at a certain point in time with markup for the local traders. Similarly, urea price is fixed by the local producer, Saudi Arabian Fertilizer Company. The price of urea was maintained at SR 700/mt (US \$200) on ex-factory basis after 1978. It was reduced to SR 550/mt (US \$157) on August 1, 1983, on ex-factory basis. However, for quantities below 1,000 mt the price was set as high as SR 600/mt. The farm-gate price varies from area to area, depending on the distance that the fertilizer is hauled. Since July 1, 1984, the urea price has again been raised to SR 630/mt. (A quantity discount of SR 20/mt is allowed for purchases above 5,000 mt).

1. Marketing Superintendent, Saudi Arabian Fertilizer Company, Dammam, Saudi Arabia.

Wheat is the major crop (grown on an estimated 300,000 ha or over 30% of total cropped area) and has received more serious attention from the Government than any other crop. The price of wheat is known, as it is fixed by the Government. Historical data on prices of other crops (governed by free market mechanism) are not available.

The current price of wheat, which has prevailed for the last several years, is fixed at SR 3,500 or US \$1,000/mt delivered to the Government silos located at different places in the Kingdom. A religious tax (Ushar) at 5% is deducted from the above price at the time of payment to farmers.

### Current Status of Subsidies

Until recently, subsidies have been provided to the farmers in the form of reduced import prices as well as guaranteed offtake of wheat at an attractive price. The subsidy program was introduced not only to ensure the short/medium and long-term development of a strong, viable agriculture but also to attain a level of self-sufficiency in food that would give Saudi Arabia a greater strategic food security. The Government appears to be committed to the cause of agriculture. For the current 5-year plan (1980-85), the Government had allocated \$21 billion for agriculture, making it the fastest growing sector of the economy. There is every indication that this sector will continue to receive high priority in the future development plans.

### Fertilizer Subsidy

The fertilizer subsidy has been administered by the Ministry of Agriculture and Water, Government of Saudi Arabia, through the Subsidy Department. There seems to have been no a priori guideline or given formula to determine the level of subsidy, except to keep the farm selling price well below the market price to create an incentive for optimum use. All fertilizers were subsidized at 50% of the ex-factory price for locally produced urea and 50% of the c.i.f. price (Saudi Port) for the imported fertilizers.

### Mechanism of Subsidy

To obtain the subsidy for the locally manufactured fertilizer, the dealers were issued an authorization by the Ministry of Agriculture. On completion of the authorized quantities, the merchant/farmer applied for reimbursement of the subsidy amount, which was 50% of the invoice value issued by the supplier.

For imported fertilizers, the above procedure was followed, except that the subsidy was paid on the c.i.f. value of the product. The c.i.f. value was taken from the sales invoice presented by the supplier/international broker to the Saudi importer.

The fertilizer subsidy was withdrawn on August 1, 1983, and no subsidy has been allowed during the current financial year (1984/85). The withdrawal of the subsidy has had little effect on fertilizer consumption during the 1983/84 wheat season.

Fertilizer prices for farmers in the Kingdom change in accordance with the free market mechanism. Therefore, prices fluctuate from time to time depending upon the international prices. The subsidy division attempts to monitor international price levels closely on the basis of international publications. Farm-level urea prices also vary from place to place within the country, increasing with the distance from factory or port. Following are the estimated average farm prices of major fertilizer products prevailing during the last wheat season (1983/84) when there was no subsidy (Table 2):

Table 2. Saudi Arabia: Fertilizer Prices, 1983/84

<u>Product</u>	<u>SR/50-kg Bag</u>
Urea	31
DAP	47
NP/NPKs	44
TSP	35

Table 3 gives the relationship of farm prices to the unsubsidized prices of major fertilizer products. The subsidized farm prices are those that were in effect during the 1982/83 wheat season:

Table 3: Saudi Arabia: Comparison of Subsidized and Unsubsidized Prices

<u>Fertilizer Product</u>	1982/83	1983/84	<u>% Subsidized</u>
	<u>Subsidized Farm-Level Price</u>	<u>Unsubsidized Farm-Level Price</u>	
	- - - - - (SR/50-kg bag) - - - - -		
Urea	22	31	29
TSP	26	35	26
NP	32	44	27
NPKs	33	44	25

Current exchange rate US \$1.00 = SR 3.564.

## Effect of Government Programs on Crop Prices

In order to provide incentive to the farmers, the Government has fixed the wheat price at an attractive level of SR 3,500 (US \$1,000)/mt. The support price program on wheat has been the major factor responsible for increased wheat cultivation, increased fertilizer use, and a harvest that has provided self-sufficiency in wheat. The prices of crops other than wheat are set by a free market system. Whereas the wheat price (delivered to Government silos) remains constant, the prices of other crops fluctuate from time to time.

Although exact data on fertilizer use by crop are not available, it is estimated that 85% of the fertilizer is used on wheat. Vegetables and forage crops grown by dairy farms are also fertilized.

### Cost of Subsidy

The total cost of fertilizer subsidy is estimated at US \$27 million in 1982/83 and US \$21 million in 1981/82.

# FERTILIZER SUBSIDIES IN SIERRA LEONE, 1984

by  
Denis M. Kamara<sup>1</sup>

## Introduction

The Republic of Sierra Leone has a population of about 3 million, which is growing at the rate of 2.3% annually. The country is basically agrarian with over 70% of the population engaged in farming. It has a tropical climate with distinct wet and dry seasons. Land under cultivation is estimated at 387,000 ha, representing 7.1% of the potential arable land of 5.5 million ha.

The main agricultural emphasis is on the cultivation of rice, the nation's staple food. Other important crops include cassava, sweet potatoes, yams, maize, sorghum, millet, sugarcane, legumes, oil palm, citrus, mangoes, coffee, cocoa, ginger, and chillies. Livestock, fisheries, forestry, mining, and manufacturing are also very important sectors of the economy.

## Fertilizer Use

Fertilizer use up to the late 1960s was very limited and was mainly restricted to research and agricultural stations. In 1966 the Sierra Leone Government approached the Federal Republic of Germany with a request for supply of fertilizer under the terms of a Technical Assistance Agreement between the two countries. The request was approved. The German Government donated various types and quantities of fertilizer and provided experts between 1967 and 1973. A Fertilizer Unit was established within the framework of the Ministry of Agriculture and Natural Resources.

The terms of the agreement emphasized that fertilizers donated should be sold to farmers at c.i.f. prices except for single superphosphate, which was initially subsidized by 25%. It was further stated that all funds obtained from the sale of fertilizers would be paid into a special bank account and used for subsequent purchase of fertilizers. The account later became the Ministry's main source of revenue for the importation and distribution of fertilizers.

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1. Fertilizer Officer, Fertilizer Marketing System Project, Freetown, Sierra Leone.

The present fertilizer consumption in Sierra Leone is estimated at 8,000 mtpy. This is far below the annual national requirement of about 20,000 mt. The reasons for the low fertilizer consumption and ineffective use include untimely distribution and poor storage facilities, high cost and inadequate rural credit, lack of extension mobility, and weak information services.

### The Need for Fertilizer Subsidy

The rapid decline of the mining industry (especially diamonds and iron ore) has necessitated Government's action in assigning top priority to agriculture in its development strategy, with the following two specific objectives: (1) to achieve self-sufficiency in the production of the nation's staple foods (especially rice) and (2) to expand the production of export cash crops, which include cocoa, coffee, oil palm, rubber, ginger, and groundnuts.

Agricultural development in Sierra Leone depends to a large extent on the productivity of the small farmer. This is reflected in the design of all Integrated Agricultural Development Projects (IADPs) and extension programs. In this regard the Government encourages farmers by providing incentives in the form of a fertilizer subsidy, good prices for the crops produced, etc.

### Pricing and Subsidy

All chemical fertilizers used in Sierra Leone are imported, and the Government is responsible for all import arrangements, distribution, and storage. Agricultural stations are distributed all over the country, and each station is provided with fertilizer storage facilities. This is intended to reduce the transport cost for the farmer. The IADPs and the Rokel Leaf Tobacco Company have also started importing chemical fertilizers for their farmers.

The pricing of fertilizers is determined by a Cabinet decision. The farm-gate price is usually less than the imported cost. The level of subsidy for any type of fertilizer is the same all over the country and for all crops. Retailing of the fertilizers to the farmer is carried out by the Ministry of Agriculture's extension agents. Unlike the IADPs, which provide credit facilities to their registered farmers, Government fertilizers are sold on a cash basis only. On the other hand, fertilizers imported by the Rokel Leaf Tobacco Company are sold at full commercial prices.

The private sector has not been very active, although it is not excluded from marketing fertilizers. The private sector is profit oriented and therefore cannot compete with the Government because of the inclusion of the subsidy in the Government fertilizer price. Although a few master farmers have been engaged in the

fertilizer trade, they, unlike Government, prefer to advance the fertilizer to the farmers and receive payment in kind rather than in cash because that is the only way they can realize a profit.

The Government policy has been to gradually phase out the fertilizer subsidy. Not only has this been the adopted policy, but strong pressure is being exerted for this to be done by the donor agencies. The loan agreements between the Sierra Leone Government and the World Bank for the IADPs all contain such covenants. There has been a gradual increase in the farm-gate price of fertilizer since 1976 (Table 1). However, this increase has not kept pace with the cost of fertilizer imports.

Table 1. Sierra Leone: Farm-Gate Fertilizer Prices, 1968-84

Fertilizer Type	1968-76	1976/77	1978/79	1979-83	1983/84	1984	
						Small Farmer	Commercial Farmer
20-20-0	-	3.00	4.50	9.00	11.00	15.00	30.00
Single superphosphate	1.00	3.00	4.50	9.00	10.00	12.00	19.00
NPK (15-15-15)	3.00	6.00	9.00	12.00	13.00	15.00	27.00
Ammonium sulfate	2.10	4.00	6.00	10.00	11.00	13.00	17.00
Potassium sulfate	2.50	5.00	7.00	11.00	12.00	14.00	-
Muriate of potash	2.00	5.00	7.50	10.00	11.00	14.00	22.00
Urea 46%	3.00	6.00	9.00	11.00	12.00	15.00	29.00
Kieserite	1.50	3.00	4.50	8.00	10.00	12.00	16.00
NPK 0-20-20	-	-	-	9.00	10.00	14.00	27.00
Basic slag	1.50	3.00	4.50	8.00	10.00	12.00	19.00

Source: Feika, L. M. 1979. "The Fertilizer Situation in Sierra Leone," A paper presented at the Food and Agriculture Organization of the United Nations Seminar on Fertilizer Pricing Policies and Subsidies at Dakar, Senegal, October 8-13.

Very recently, the Government took another bold step in reducing the amount spent on subsidy by eliminating the fertilizer subsidy for commercial farmers (Table 1).

#### Effect on Subsidy Reduction

In 1975/76 fertilizer use totaled 5,100 mt. Table 2 clearly indicates the strong reaction from farmers when the price was substantially increased by 100%. Use plummeted by a corresponding amount.

A survey conducted by the author and an expatriate in May 1981 revealed that the price relationship between fertilizers and the price that can be realized in the sale of the crop produced (in this case, rice) was partly responsible for the strong reaction from farmers. Ten years earlier, before the survey was conducted,

the price of a 50-kg bag of 20-20-0 (commonly known as rice fertilizer) was Le 1.50, and the going price for raw rice was Le 2.50/bushel. In 1981 the price of rice fertilizer was Le 9.00/bag, whereas the price laid down by Sierra Leone Produce Marketing Board was Le 8.00/bushel of rice parboiled by the producer. Hence, the claim existed everywhere that fertilizers were not used because they were too expensive. Many farmers could have used fertilizers provided they were made available on credit.

Table 2. Sierra Leone: Prices of Selected Fertilizer Products

Fertilizer Product	Price			
	1973/74	1974/75	1975/76	1976/77
	(Le/50-kg bag)			
20-20-0	1.50	1.50	1.50	3.00
15-15-15	3.00	3.00	3.00	6.00
Urea	3.00	3.00	3.00	6.00
Muriate of potash	2.50	2.50	2.50	5.00
Annual usage, mt	2,797	3,348	5,100	2,511

Source: Percy, P. F. 1982. "Fertilizer Marketing System; Scope for Alternative Fertilizer Marketing Policies." Prepared for the Sierra Leone Government by the Food and Agriculture Organization of the United Nations and the United Nations Development Program.

In 1982 the prices of farm produce were significantly increased by the Government. A bushel of parboiled rice was increased from Le 8.00 to Le 20.00 while the going price for rice fertilizer was Le 9.00/50-kg bag.<sup>2</sup> However, there have also been two price increases for fertilizer between 1983 and 1984 (Table 1). The current price for rice fertilizer is Le 15.00/50-kg bag for the small farmer and Le 30.00 for the commercial farmer. This means that a small farmer is still able to use one bushel of parboiled rice to buy one bag of rice fertilizer and use the difference (Le 5.00) for transport.

Presently, there is an acute shortage of fertilizers in the country. Moreover, since the price increase is very recent, it is too early to determine what farmers' reaction will be to the new price increase.

2. Exchange rate US \$1.00 = Le 2.51.

## FERTILIZER SUBSIDIES IN SRI LANKA, 1984

by  
C. R. Kuruppu<sup>1</sup>

Fertilizer has been subsidized in Sri Lanka for the past several years to encourage its use in agriculture. At times there were different rates of subsidy for the fertilizers used on different crops, and this led to a leakage of fertilizer meant for one crop to another because of comparative cost advantage. In recent years, the State subsidy on fertilizer has been based on import or ex-factory cost so that it is reflected in the selling prices of straight fertilizer or fertilizer mixtures using different ingredients. Consequently, leakage of fertilizer from one crop to another has been eliminated.

Until recently the fertilizer subsidy was administered by the Treasury. In June 1983, the entire administration of this subsidy, within the overall financial allocation and broad guidelines determined by the Treasury, was transferred to the National Fertilizer Secretariat.<sup>2</sup>

The main fertilizers used in Sri Lanka are urea and AS to satisfy the nitrogen requirements; TSP, imported phosphate rock (PR) and local ground phosphate rock (LPR) for phosphate needs; MOP for potash; and NPK compound fertilizer for paddy cultivation in the ill-drained soils of the low-country wet zone.

With the exception of AS, these important fertilizers are subsidized by the State although the extent of such subsidies varies. No subsidy is given for AS in that it is the Government's policy to encourage the greater use of urea because of both its high nutrient content<sup>3</sup> and the local facilities for urea manufacture.

For a long time the subsidy on imported fertilizers was paid as percentage of c.i.f. cost. However, today these subsidies are paid as fixed sums in terms of U.S. dollars for the different fertilizers. Such a change was effected to avoid the payment of very high subsidies when imported prices were very high.

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1. Director, National Fertilizer Secretariat, and Chairman, Ceylon Fertilizer Corporation, Colombo, Sri Lanka.

2. The National Fertilizer Secretariat was established in February 1979, primarily for the purpose of coordinating all fertilizer affairs in the country and for the formulation and implementation of fertilizer policies at a national level, including pricing and subsidies. Today, it also engages in the general promotion of the use of fertilizer in agriculture; training of fertilizer personnel, both locally and overseas; the administration of the fertilizer subsidy; and the collection, analysis, and dissemination of fertilizer data.

3. The nutrient (N) content of urea is 46%, whereas that of AS is only 21%.

The current subsidy on different subsidized fertilizers is as follows:

Local urea	Rs 3,600/mt
TSP	US \$111/mt
PR	US \$21/mt
MOP	US \$60/mt
NPK compound fertilizer	US \$66/mt

Locally produced fertilizers in Sri Lanka are urea and PR. The latter is not a perfect substitute for the imported PR because of its low solubility; consequently, it is used only on certain soils in the country. No subsidy is given for local PR where the selling price is much less than that of the imported product. The subsidy on local urea at Rs 3,600/mt is 60% of the estimated local cost of production of Rs 6,000/mt.

Since 1981 the Government has provided an annual allocation of Rs 1,000 million in its budget for the fertilizer subsidy. The significance of this subsidy could be appreciated from the fact that the total estimated Government expenditure, both recurrent and capital, for the current year 1984 is Rs 50.7 billion. Thus, 2% of the total Government expenditure has been allocated to finance the fertilizer subsidy.

The impact of the fertilizer subsidies can be measured from the data in Table 1, in which the current retail prices of the more important fertilizers and the probable prices without the subsidy are indicated.

Table 1. Sri Lanka: Retail Prices of Main Fertilizer Ingredients and Probable Price Without Subsidy, September 1984

Type of Fertilizer	Current Price	Estimated Prices Without Subsidy	% Subsidized
		(Rs/mt)	
Urea	2,850	6,450	56
TSP	2,850	5,550	49
PR	2,000	2,530	21
NPK 5-15-15	3,300	5,075	35
MOP	2,750	4,100	33

Source: National Fertilizer Secretariat.

It can be seen that the price of urea would have been Rs 6,450/mt instead of the current level of Rs 2,850/mt. Similarly, TSP and NPK compound fertilizer would have been Rs 5,550/mt and 5,075/mt instead of Rs 2,850/mt and Rs 3,300/mt, respectively.

However, the effect of the fertilizer subsidy on prices was more significant a few years ago, as can be seen from the 1980 data in Table 2.

Table 2. Sri Lanka: Retail Prices of Main Fertilizer Ingredients and Probable Prices Without Subsidy in 1980

Type of Fertilizer	Price in 1980	Estimated Price in 1980 Without Subsidy	% Subsidized
	----- (Rs/mt) -----		
Urea	980	3,838	74
AS	1,490	2,694	61
TSP	1,335	3,074	57
MOP	1,065	2,766	61

Source: National Fertilizer Secretariat.

The intention of the Government in providing fertilizer subsidies is to encourage the use of fertilizer in adequate quantities in agriculture and to inform the people of its importance for efficient cultivation. The Government proposes to progressively reduce these subsidies with the gradual realization of these objectives and to curtail its burden on the finances of the State. Thus, although the annual allocation for the fertilizer subsidy has remained constant at Rs 1,000 million since 1981 and may continue to be so in the immediate years ahead, its significance has declined with inflation and the rising overall expenditure of the Government.

The annual budgetary provision and the actual annual expenditure incurred on the fertilizer subsidy over the years 1979-83 are given in Table 3. While annual budgetary provision has remained stable since 1981, the actual expenditure has varied from Rs 1,200 million in 1981 to Rs 705 million in 1983.

The use of the fertilizer subsidy in 1983 by type of fertilizer is indicated in Table 4, which includes the actual subsidy, the tonnage involved, and each fertilizer's percentage share of the total subsidy. It can be seen from these data that urea with a total subsidy of Rs 494.7 million accounted for 70% of the total expenditure incurred on the fertilizer subsidy during that year. MOP and TSP had each accounted for 10% of the subsidy while NPK was responsible for 9%.

Table 3. Sri Lanka: Fertilizer Subsidy--Annual Budgetary Provision and Actual Expenditure, 1979-83

Year	Annual Budgetary Provision	Actual Expenditure
----- (million Rs) -----		
1979	870	975
1980	870	NA
1981	1,000	1,200
1982	1,000	893
1983	1,000	705

Source: National Fertilizer Secretariat.

Table 4. Sri Lanka: Subsidy Expenditure for Different Fertilizers, 1983

Type of Fertilizer	Total Quantity (mt)	Total Subsidy ('000 Rs)	% of Total Subsidy
Urea	134,330	494,694	70
MOP	47,800	74,002	10
TSP	26,180	68,926	10
NPK	35,060	61,057	9
PR	14,400	6,709	1
TOTAL	257,770	705,388	100

Source: National Fertilizer Secretariat, General Treasury.

The estimated use of the State subsidy on fertilizer by the more important agricultural crops during the year 1983 is given in Table 5. For this exercise, the use by these crops of different fertilizer ingredients during that year was related to the average subsidy applicable for fertilizer ingredients in that year. It will be seen that of the total subsidy on this basis of Rs 775.7 million in 1983, as much as Rs 488 million or 63% was used by the paddy sector. The reason is that the highest levels of subsidy are given to fertilizer ingredients largely used in that sector, such as urea and TSP and to a lesser extent MOP and NPK compound fertilizer that is used in paddy cultivation. On the other hand, in the tea sector the main fertilizer used is AS for which there is no subsidy. The largest quantity of local PR is also used by the tea sector, and for this item there is no subsidy.

Table 5. Sri Lanka: Estimated Utilization of Subsidy by Crops, 1983

	Urea	PR	TSP	MOP	NPK	Total	Share (%)
	(million Rs)						
Paddy	364,527	2,758	60,166	25,455	37,877	488,025	63
Tea	95,928	2,368	-	24,536	-	123,222	16
Rubber	14,086	2,368	-	5,438	-	21,892	3
Coconut	16,157	4,114	647	16,823	-	37,741	5
SFC <sup>a</sup> )							
MEC <sup>b</sup> )							
Tobacco)	43,564	2,530	28,771	16,653	13,653	104,841	13
Others )							
TOTAL	534,262	11,770	89,585	88,905	51,200	775,721 <sup>c</sup>	100
% share	69	2	12	11	6	100	100

a. Subsidiary food crops.

b. Minor export crops.

c. This figure is not the same as the actual expenditure incurred on the subsidy during the year 1983 since it is based on actual consumption of fertilizer by the different crop sectors.

Source: National Fertilizer Secretariat.

Thus, the significance of the fertilizer subsidy on prices has declined in recent years with the freezing of the overall financial provision for the subsidy at Rs 1,000 million/year. Nevertheless, the fertilizer subsidy still has a considerable impact on these prices and is especially important to the paddy sector where most of the fertilizers used are heavily subsidized.

It is necessary to reduce and eventually eliminate these subsidies with the realization of the importance of fertilizer by those involved in agriculture. However, elimination of the subsidy should be undertaken progressively, with caution and circumspection so that it will not adversely affect fertilizer use in the country. Thus, the Government policy of maintaining the financial allocation for the fertilizer subsidy at Rs 1,000 million/year since 1981 in a country with an average annual inflation rate of about 15% could be considered a prudent course of action.



## FERTILIZER SUBSIDIES IN TURKEY, 1984

by  
Esin Gökan<sup>1</sup> and Sezai Bayraktar<sup>2</sup>

### Fertilizer Use and Crop Prices

Turkey's Ministry of Agriculture, with the assistance of FAO, launched an intensive program in the early 1960s to introduce and encourage the use of fertilizers. With intensive agricultural extension efforts and other incentives such as timely distribution of fertilizers, agricultural credit, mechanization, and establishment of irrigation facilities, fertilizer consumption increased sharply. It grew from 87 thousand mt in 1963 to 617.3 thousand mt in 1974 and to 1.6 million mt in 1983. It is estimated that consumption will be 1.7 million mt in 1984 (Table 1). As will be noted from the table, a steady increase can be observed except for 1980. In 1980 after 5 years of constant fertilizer retail price, the Government doubled the retail prices, and this caused a sharp decrease in fertilizer consumption. In 1981 another retail price increase was made, but consumption was not affected severely.

#### Fertilizer Consumption by Product

Fertilizer consumption has increased steadily for all types of products except SSP. The sharpest rise was in compound fertilizer.

#### Fertilizer Consumption by Crops

As an average of the last 10 years, cereals use the largest share of fertilizer (Table 2). Cereals use about 59% of the total amount of fertilizer consumed in Turkey. Wheat alone consumed 43% of Turkey's total fertilizer use.

#### Crop Prices

Prices of different crops are given in Table 3. Prices of main crops are fixed by the Government as base prices each year.

1. Vice President, Toros Fertilizer and Chemical Industry Company, Inc., Istanbul, Turkey.

2. Chief of Agricultural Research Department, Toros Fertilizer and Chemical Industry Company, Inc., Istanbul, Turkey.

Table 1. Turkey: Fertilizer Consumption by Product Type

Product Types	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
	( '000 tons)										
Ammonium sulfate (21-0-0)	359.0	286.4	451.1	481.9	593.2	630.4	517.5	441.2	433.0	451.8	390.0
Ammonium nitrate (21-0-0)	43.5	64.1	61.5	56.6	64.6	66.4	51.7	42.0	50.6	52.2	49.0
Calcium ammonium nitrate (26-0-0)	726.3	645.5	961.6	1,071.3	1,059.9	970.4	707.2	1,091.9	1,290.4	1,493.1	1,470.0
Urea (46-0-0)	207.5	131.7	294.7	243.4	359.1	329.7	369.4	426.3	396.8	505.9	440.0
Single superphosphate (0-17-0)	230.9	190.6	107.2	93.6	90.9	54.7	27.1	27.8	39.7	39.1	38.0
Triple superphosphate (0-43-0)	345.1	419.4	675.2	598.5	610.3	548.6	419.8	374.0	423.2	502.9	445.0
Diammonium phosphate (18-46-0)	137.2	173.9	429.7	500.8	579.3	680.5	493.7	497.3	480.0	472.3	475.0
Compound	223.3	188.1	109.6	379.4	490.6	550.9	394.4	535.9	732.7	911.9	840.0
Potassium sulfate	33.5	31.6	30.8	7.2	5.6	34.3	39.3	44.6	35.8	7.7	17.0
N	382.9	367.6	590.9	665.8	776.7	779.3	638.4	776.7	847.6	991.2	924.4
P <sub>2</sub> O <sub>5</sub>	217.7	324.8	522.1	572.9	635.2	660.0	483.0	495.5	569.9	618.2	578.3
K <sub>2</sub> O	16.7	15.8	31.1	19.6	20.8	37.9	44.5	37.6	33.3	24.6	26.5
TOTAL	617.3	708.2	1,144.1	1,258.3	1,432.7	1,477.2	1,165.9	1,309.8	1,450.8	1,634.0	1,529.2

Table 2. Turkey: Fertilizer Consumption by Crops

Crops	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984 (Preliminary)
	('000 tons plant nutrient)										
Wheat	174.5	241.8	511.7	575.3	656.4	635.6	446.9	572.4	620.7	714.2	669.2
Barley	25.0	31.3	68.1	83.7	107.0	121.6	47.2	130.5	140.5	153.2	135.0
TOTAL CEREALS	241.6	318.8	649.2	732.6	861.0	861.6	611.3	778.5	860.8	968.0	874.2
Cotton	103.0	92.8	87.3	107.8	92.2	98.1	71.5	92.0	99.1	102.5	120.0
Sugar beet	74.2	75.5	88.9	79.7	73.1	89.6	92.0	70.0	92.9	103.9	100.0
Sunflower	34.2	41.3	69.6	57.7	77.7	79.6	82.0	75.1	81.5	99.5	100.0
Fruits	87.4	91.0	127.3	141.5	163.7	177.2	120.4	132.7	137.8	171.3	160.0
Vegetables	34.9	38.8	56.2	64.1	77.0	75.7	80.8	70.5	80.1	79.3	75.0
Others	42.0	50.0	65.6	74.9	88.0	95.4	107.9	91.0	98.6	109.5	100.0
TOTAL	617.3	708.2	1,144.1	1,258.3	1,432.7	1,477.2	1,165.9	1,309.8	1,450.8	1,634.0	1,529.2

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Table 3. Turkey: Crop Prices

Crops	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
	(TL/kg)										
Wheat	2.12	2.34	2.58	2.95	3.61	5.28	10.81	18.54	27.00	32.00	46.00
Barley	1.64	1.76	1.87	2.59	3.41	4.70	9.00	14.00	16.00	22.00	44.00
Corn	2.10	2.32	2.52	3.30	4.36	5.91	9.00	13.00	22.00	26.00	45.00
Rice	7.61	8.00	9.00	9.35	13.98	18.92	26.37	55.45	65.00	80.00	115.00
Cotton	8.00	10.25	13.75	28.49	31.03	49.61	50.00	63.00	78.00	91.00	160.00
Sunflower	3.75	5.50	5.75	7.07	8.21	11.72	30.00	40.00	45.00	62.00	95.00
Sugar beet	0.38	0.55	0.58	0.63	0.74	1.11	1.62	3.99	5.00	6.00	-
Tobacco	23.15	31.29	39.13	45.19	48.98	61.18	79.70	131.95	240.00	295.00	490.00
1 US \$ = TL	13.74	14.31	15.86	17.83	24.07	37.55	76.03	110.24	160.94	224.03	360.00

## Current Status of Fertilizer Subsidies

In Turkey fertilizers are procured (either bought from domestic producers or imported) and distributed by two Government-owned companies.

The Government of Turkey is exercising a dual pricing policy on fertilizer prices. Under this policy, the Government supplies the fertilizers to farmers (by Government-owned companies) at a lower price level than its procurement price including handling and transportation costs. The deficit, the difference between the retail price and the procurement costs, is subsidized by the Government.

The main purpose of the subsidy on fertilizers is to encourage farmers to use more fertilizers. In fact, this dual price policy contributed to a higher consumption of fertilizer. The decrease in consumption in 1980, the year that the retail price was doubled, can be proof of the effectiveness of this dual price policy in increasing fertilizer consumption.

On the other hand, the fertilizer subsidy has increased steadily since its beginning in 1974. The subsidy was about 1.0 billion TL in 1974 and reached 120 billion TL ( $\approx$ 535 million US \$) in 1983 (Table 4).

Table 4. Turkey: Fertilizer Subsidy by Years

<u>Years</u>	<u>Subsidy</u>	
	<u>'000 TL</u>	<u>Million US \$</u>
1974	1,049,000	71
1975	2,554,000	170
1976	3,660,000	229
1977	4,520,000	238
1978	12,083,000	465
1979	28,325,000	674
1980	38,349,000	609
1981	68,491,000	623
1982	73,371,000	506
1983	120,000,000	536
1984 (preliminary)	136,865,000	380

### Fertilizer Subsidy

Wheat is the main food crop in Turkey, and it uses the largest share of fertilizer. Wheat is grown mostly under dryland conditions, and the yields are relatively low. In determining the fertilizer retail prices, wheat is taken as the base crop, and all

of the above factors are taken into account. A wheat price:fertilizer price ratio that encourages dryland wheat farmers to use fertilizer is selected.

A total subsidy amount for fertilizers is allocated by the Government in accordance with general economic trends and intentions. This total is distributed among the different products.

### Effect of Government Programs on Crop Price

The Turkish Government has a pricing policy that guarantees the price of the main crops. Guaranteed prices are calculated by taking into account production costs of crops and also their world market prices.

Generally, at harvesting time guaranteed prices are equal to farm-level prices and tend to rise depending on the supply/demand situation of the domestic market and export situation.

### Cost of Subsidy

The total cost to the Government of fertilizer subsidies by years is given in Table 4. The 1984 figure is a preliminary figure since the year is not over yet. However, increases in cost of fertilizers and probable retail price increases are taken into account in the calculations. The amount of the subsidy has increased steadily (Table 4).

If this expected price increase takes place, fertilizer subsidy would start to decrease for the first time in Turkey.

The percentages of the agricultural and total budgets represented by fertilizer subsidy are given in Table 5. It can be noted from Table 5 that, in general, the fertilizer subsidy represents a huge amount in the agricultural budget; this varies from 21.9% to 112.0% of the agricultural budget. In 1979 the sum of money spent as fertilizer subsidy was more than the agricultural budget.

It is also noted that an average of 4% of the total annual budget is allocated as fertilizer subsidy.

Table 5. Turkey: Percentage of Agricultural and Total Budget  
Represented by Fertilizer Subsidy

<u>Years</u>	<u>Agricultural Budget</u> ------(%)-----	<u>Total Budget</u> -----
1974	21.9	1.5
1975	36.0	2.4
1976	34.8	2.4
1977	27.8	2.0
1978	78.8	4.4
1979	112.0	6.9
1980	94.2	5.1
1981	81.8	4.4
1982	74.1	4.1
1983	80.3	4.7
1984 (preliminary)	71.1	4.3

## FERTILIZER SUBSIDIES IN VENEZUELA, 1984

by  
Carlos F. Sanchez<sup>1</sup> and Luis F. Rivero I.<sup>2</sup>

### Introduction

The petrochemical industry in Venezuela began producing fertilizer in 1958 with the startup of a small plant at Moron in central Venezuela. That year the total production was 11,489 mt of NPK fertilizer in a powdered form. With the increase in local demand, it was necessary to expand the complex for nitrogen and commence producing granular NPK grades; since then Venezuela has been supplementing its own fertilizer production with imported products and raw materials.

The production and marketing of fertilizer were the responsibility of Instituto Venezolano de Petroquímica (IVP), a Government company under the Ministerio de Minas e Hidrocarburos until November 30, 1977. Since December 1, 1977, PEQUIVEN has been responsible for the fertilizer operations. PEQUIVEN is an affiliate of Petroleos de Venezuela, S.A. (PDVSA), a state-owned oil and petrochemical industry. PEQUIVEN increased fertilizer production from 195,000 mt in 1978 to more than 483,000 mt in 1981.

The production of granular NPK started in July 1980. Since 1981 all powdered NPK production has been replaced by granular NPK.

In November 1977, Venezolana de Fertilizantes, C.A. (VENFERCA), was created under the Ministry of Agriculture with the main purpose of marketing fertilizer locally. This function was performed until December 1981, when the Government decided to concentrate all the fertilizer activities (production and marketing) in PEQUIVEN. PALMAVEN was then responsible for the marketing and distribution of fertilizer for all of Venezuela. PALMAVEN is an affiliated company of PEQUIVEN.

### Current and Historical Subsidy

Since 1958 fertilizer has been subsidized by the Government. In 1979 the estimated amount for subsidy was \$84.1 million, which represented 62% of the total cost. Table 1 shows the estimated subsidy cost for 1979 and 1980. Until discontinued in March 1981, the subsidy cost increased significantly because of increases in manufacturing cost, whereas the subsidized prices remained fixed at low levels.

1. Agronomic Engineer, PALMAVEN, Caracas, Venezuela.
2. Coordinacion de Petroquímica, PDVSA, Caracas, Venezuela.

Table 1. Venezuela: Estimated Subsidy Value

	<u>1979</u>	<u>1980</u>
Average sale price/mt of fertilizer, <sup>a</sup> \$	97.9	101.4
Total cost/mt of fertilizer, \$	255.1	336.0
Subsidy/mt of fertilizer, \$	157.2	264.7
Subsidy as a percentage of the total cost, %	61.6	72.0
Fertilizer sold in Venezuela, '000 mt	535.0	554.0
Amount of subsidy, <sup>b</sup> Bs million	361.7	630.5
\$ million	84.1	146.6

a. \$1 = 4.30 Bs.

b. Estimated.

Source: Carlos F. Sánchez calculations.

In 1981 the Government decided to eliminate the subsidy with the purpose of making the fertilizer industry self-supporting. However, the amount of fertilizer sold was not enough to cover production costs. Several actions were taken to compensate the farmers for those crops in which the increase in fertilizer price was most significant.

As a direct consequence of the new price, the consumption of fertilizer dropped to the levels shown in Table 2.

In March 1984 the Government decided to reinstitute the subsidy on fertilizers. This new subsidy amounts to Bs 411 million, or US \$55 million,<sup>3</sup> which includes a reduction of 50% in the sales price of each fertilizer product and an additional adjustment according to the new exchange rate (\$/Bs) for the imported raw materials. The change to a fertilizer subsidy policy has had a tremendous effect. Sales have increased above the predicted demand. This implies additional imports to meet the demand. Farmers are using more fertilizer per hectare as a result of the lower subsidized price.

The 1984 total subsidy cost is US \$55 million which represents 8.2% of the agricultural budget. Next year the Government will probably spend more on subsidies because its plans include increased crop areas, requiring a higher fertilizer demand.

### Fertilizer Subsidy

Government regulates the price of fertilizers through cost studies made by the Ministry of Agriculture and the Ministry of Promotions and Development. The Government takes into account the cost of production of crops, crop prices at farmer and retail levels, and the cost of fertilizer imports.

3. US \$1 = 7.50 Bs.

Table 2. Venezuela: Fertilizer Use by Product (Sales and Imports), 1980-83

Product	1980	1981	1982	1983
	(mt)			
Urea	109,359	71,170	69,778	75,854
AS	49,296	37,731	36,073	35,580
AN	5,450	2,146	111	0
DAP	13,173	8,571	10,337	18,828
TSP	14,393	4,889	5,153	6,490
KCl	6,898	2,902	8,275	5,490
SOP	3,445	334	1,245	2,341
<u>Granulars</u>				
12-12-6 CP	0	0	0	3,530
12-12-6 SP	12,942	6,096	2,673	6,136
12-12-17/2 CP	267	0	148	0
12-12-17/2 SP	49,987	33,455	55,168	67,148
12-24-12 CP	118,618	104,219	89,074	60,753
13-13-21 SP	22,802	4,209	2,022	1,264
13-26-6 SP	20,151	0	0	0
15-15-15 CP	2,595	60,170	63,703	64,605
15-15-15 SP	52,841	5,751	288	19
20-10-5/2 SP	324	0	0	0
12-24-12 SP	0	114	0	0
13-13-21 CP	0	25	0	0
13-26-6 CP	0	108	44	23
12-12-17 CP	0	0	6,124	2,735
<u>Powders</u>				
3-15-15 SP	536	625	0	56
5-20-20/2 NP	325	17	54	10
6-12-18/2 NP	32	1	0	0
6-24-24 NP	1	0	0	0
8-16-24 SP	880	0	0	0
10-10-15 CP	2,026	0	0	3
10-10-15 SP	7,933	19	14	10
10-10-15/2 SP	5,199	21	145	81
12-12-6 CP	22,362	1,026	116	786
12-12-6 SP	31,532	10,157	6,349	5,840
12-12-17/2 SP	115	1,201	0	0
Others	0	0	0	1,307
TOTAL	553,482	354,957	356,894	358,889

Note: The source of potassium is CP = potassium chloride, SP = potassium sulfate, NP = potassium nitrate.

Source: PEQUIVEN/PALMAVEN statistics.

The major agricultural objective of the Government is to emphasize self-sufficiency in food. Therefore, specific objectives will be necessary, such as decreasing crop costs, increasing

fertilizer production, reducing food imports and external inflation, and increasing fertilizer use.

The price of fertilizer is the same for all the crops. No differentiation is made according to the type of crop.

The fertilizer subsidy is the same for large and small farmers. In extensive crops such as cereals, fertilizers represent a large percentage of the production cost. This percentage is relatively low for intensive crops such as vegetables.

### Effect of Government Programs on Crop Prices

The current fertilizer prices have been in effect since March 1984. The current crop price at farm level has been in effect since 1980 except for rice (1982), maize (1981), and some other crops shown in Table 3. The historical fertilizer use and fertilizer and crop prices are indicated in Table 4.

Table 3. Venezuela: Current Farm-Level Prices of Major Crops

Crops	Prices	
	Bs/mt	\$/mt
Rice	1,600	213.33
Maize	1,800	240.00
Sorghum	1,400	186.67
Blackbeans	4,000	533.34
Soybeans	2,000	266.67
Beans	3,000	400.00
Potatoes	1,150	153.34
Sugarcane	4,000	533.34
Peanuts	3,650	486.67
Sesame	3,600	480.00
Plantains	500	66.67
Bananas	270	36.00
Garlic	4,900	653.34
Coffee <sup>a</sup>	430-860	57.34-114.67
Cotton	4,650-5,530	620.0-737.34

a. Each 46-kg bag (1 quintal).

Source: "Informe Anual 1982," Corporación de Mercadeo Agrícola (CMA).

Generally the Government does not use a formula to determine the subsidy because it is a political decision. Technically, the Government strives for a balance between the cost of fertilizer and the price of crops.

Table 4. Venezuela: Historical Fertilizer Use and Fertilizer and Crop Prices

Year	Crop Area ( '000 ha)	Price Index <sup>a</sup> (%)	Price of N <sup>b</sup>	Price of P <sub>2</sub> O <sub>5</sub> <sup>b</sup> (Bs/mt)	Price of K <sub>2</sub> O <sup>b</sup>	Average Crop Prices <sup>c</sup>
1979	1,738	273.0	1,030.02	1,114.90	1,238.04	4,565
1980	1,765	331.4	967.73	1,088.92	1,327.85	5,371
1981	1,669	384.4	2,871.66	2,435.85	4,436.17	6,564
1982	1,637 <sup>d</sup>	401.6	3,540.47	2,991.57	4,294.65	6,560
1983	1,508 <sup>d</sup>	431.9 <sup>c</sup>	2,927.62	2,133.10	4,372.97	NA

a. 1968 = 100.

b. Basic data used in estimation of price per metric ton of nutrient was provided by PEQUIVEN/PALMAVEN.

c. IFDC estimate.

NA = not available.

US \$1 = 4.30 Bs.

Source: "Anuario de Series Estadísticas 1983," Banco Central de Venezuela.

Appendix Table 1. Venezuela: Imports Sold by Farmer Associations in 1982/83

<u>Product</u>	<u>1982</u>	<u>1983</u>
	- - - - - (mt) - - - - -	
15-15-15	5,000	4,000
12-12-17/2	32,495	19,377
12-12-17	2,504	0
KCl	1,076	0
AS	654	0
12-24-12	8,032	0
TOTAL	49,761	23,377

Source: PALMAVEN sales records.

Appendix Table 2. Venezuela: Fertilizer Prices, September 1984

<u>Product</u>	<u>Bs/50-kg Bag</u>	<u>\$/50-kg Bag</u>
Urea	32.45	4.33
AS	27.50	3.67
KCl	27.50	3.6
SOP	34.25	4.57
TSP	30.80	4.11
DAP	35.30	4.71
CAN	17.90	2.39
<u>Granulars</u>		
12-12-06 CP	30.80	4.11
12-12-06 SP	31.90	4.25
12-24-12 CP	35.00	4.67
12-24-12 SP	36.75	4.90
12-12-17/2 SP	36.55	4.87
13-13-21 CP	34.20	4.56
13-13-21 SP	37.20	4.96
13-26-6 CP	33.60	4.48
20-20-0	19.15	2.55
25-15-0	17.00	2.27
15-15-15 CP	32.95	4.39
15-15-15 SP	35.00	4.67
20-10-5/2	23.40	3.12
12-12-17 CP	29.95	3.99
16-16-08 CP	29.55	3.94

Source: PALMAVEN price list.

Appendix Table 3. Venezuela: Principal Crops Grown and Percentage of Total Fertilizer Consumption

<u>Crops</u>	<u>Number of Hectares Grown</u> ( '000 ha)	<u>Percentage of Total Fertilizer Consumption</u> (%)
Rice	214.1	18.3
Sorghum	216.3	18.6
Maize	374.3	19.5
Sugarcane	75.5	7.6
Coffee	260.0	5.3
Cotton	33.3	2.8
Tobacco	10.0	2.2
Potatoes	16.8	2.7
Fruits	138.3	8.0
Cocoa	68	0.3
Others <sup>a</sup>	<u>210.6</u>	<u>7.4</u>
TOTAL	1,617.0	92.7

a. Others are cassava, beans, sesame, and peanuts.

Source: PALMAVEN.



## FERTILIZER SUBSIDIES IN ZAMBIA, 1984

by  
A. C. Kani<sup>1</sup>

### Current and Historical Fertilizer Use and Fertilizer and Crop Prices

#### Fertilizer Use

The Government of Zambia has realized the importance of fertilizer in improving the standard of living of farmers and in reducing the country's dependence on imported foods. To this end, the Government has adopted a policy aimed at encouraging fertilizer use, particularly by the less privileged rural people.

The consumption of fertilizer has increased by 58.5% over the last 8 years.<sup>2</sup> In the last 5 years consumption has increased by 63%. The consumption of fertilizer in 1982 remained the same as in 1981. Sales in 1983 declined sharply (Table 1).

The increased use of fertilizer in the last 8 years is largely due to the fertilizer subsidy and farmers' awareness of the important role fertilizer plays in crop production. The same consumption of fertilizer in 1982 as in 1981 was due partly to late arrival in the country of urea and "R"<sup>3</sup> compound in 1982.

It has been estimated that more than 95% of fertilizer used in the country is used in the production of maize (Table 1). The remainder is used on sunflowers, soybeans, and wheat. The growth rate of consumption of fertilizer mentioned above is attributed to increased use of fertilizer in maize production. The types of fertilizer used for growing maize are these: D,<sup>4</sup> X,<sup>5</sup> and R compounds, urea, ammonium nitrate, and ammonium sulfate.

1. Manager Fertilizers, Implements Pesticides and Seeds Division, National Agricultural Marketing Board (NAMBOARD), Lusaka, and Acting General Manager, NAMBOARD.

2. Fertilizer consumption is defined as fertilizer sales by NAMBOARD to the Cooperatives and to farmers, although, all fertilizer sold is not used by farmers in the year sales are made.

3. 20-20-0 with 12% sulfur.

4. 10-20-10 with 12% sulfur.

5. 20-10-5 with 12% sulfur.

Table 1. Zambia: Fertilizer Sales to Provinces and Farmers by NAMBOARD

Type	1975	1976	1977	1978	1979	1980	1981	1982	1983
	--(tonnes)--								
"A" <sup>a</sup>	115	-	303	476	151	58	4	17	6
"C" <sup>b</sup>	8,389	3,228	539	5,988	4,298	5,298	6,079	4,164	2,317
"V" <sup>c</sup>	3,732	563	4,117	3,617	1,282	1,509	2,308	1,426	748
"R" <sup>d</sup>	17,483	21,909	23,472	16,709	26,448	38,977	41,819	31,762	17,378
"X" <sup>e</sup>	20,360	22,161	30,121	20,166	19,952	35,534	29,853	37,929	28,761
"D" <sup>f</sup>	24,705	30,411	31,673	30,184	28,005	28,921	35,924	53,163	43,396
Urea	32,043	46,780	47,713	27,536	42,402	57,171	64,793	58,163	52,626
Ammonium sulfate	6,412	715	2,197	2,030	870	1,294	1,898	2,305	261
Ammonium nitrate	17,793	17,284	25,339	20,292	17,842	24,317	26,458	21,191	16,265
Sodium nitrate	708	708	254	563	156	167	297	30	21
Potassium chloride	11	38	134	87	140	141	105	43	110
Potassium sulfate	316	1	35	62	62	78	185	63	61
SSP	1,086	651	130	308	137	517	236	99	151
TSP	386	1,325	1,480	1,588	1,581	2,051	1,919	662	666
Others	156	4,900	-	471	2,035	197	16	0.5	768
Total	133,695	150,774	130,077	130,077	145,368	196,361	211,940	211,863	163,536

a. "A" grade = 2-18-15 with 10% sulfur and 0.1% boron.

b. "C" grade = 6-18-12 with 10% sulfur and 0.1% boron.

c. "V" grade = 4-18-15 with 10% sulfur and 0.1% boron.

d. "R" grade = 20-20-0 with 12% sulfur.

e. "X" grade = 20-10-5 with 12% sulfur.

f. "D" grade = 10-20-10 with 12% sulfur.

The future use of all but ammonium sulfate will continue to increase. The low demand for ammonium sulfate stems from the fact that most soils in the country are of low pH and applying ammonium sulfate to them aggravates soil acidity. This fertilizer is recommended today only for potato production. Potatoes grown under alkaline conditions are prone to attack by potato scab (Actinomyces scabii). An application of ammonium sulfate neutralizes alkaline conditions and checks potato scab.

The consumption of C,<sup>6</sup> V,<sup>7</sup> and A<sup>8</sup> compounds and that of sodium nitrate over the last 8 years has decreased by 54%. The consumption of A compound has decreased sharply because of its low nitrogen content, and this fertilizer type is being phased from the market. These fertilizers are used mainly in the growing of tobacco, and the decline in their use is due to the drop in the production of tobacco. The consumption of these fertilizers will continue to decrease in the coming years until the tobacco trade is revamped. This will call for the introduction of incentives for tobacco growers, improved extension services, availability of credit, and attractive prices.

The use of SSP and TSP has remained low over the last 8 years. These fertilizers are used in the production of oil crops and leguminous crops such as sunflower, groundnuts, soybeans, and sugarbeans. The limited use of SSP and TSP is due to farmers' preference for NPK fertilizers which contain not only phosphates but also other essential plant nutrients. The consumption of SSP and TSP will remain low in the future, and there is a possibility of withdrawing them from the market and replacing them with diammonium phosphate and monoammonium phosphate which have a higher nutritive value.

The consumption of potassium chloride and potassium sulfate which are mostly used in vegetable production has been low in the past and will remain so for many years to come. This is due to farmers' preference for NPK fertilizers.

Insignificant amounts of agricultural lime have been used over the past 10 years. This type of fertilizer is now being promoted, and its use will assume great importance in the years ahead.

- 
6. 6-18-12 with 10% sulfur and 0.1% boron.
  7. 4-18-15 with 10% sulfur and 0.1% boron.
  8. 2-18-15 with 10% sulfur and 0.1% boron.

## Current Status of Subsidies

The National Agricultural Marketing Board of Zambia is the only organization that is vested with the responsibility of importing and buying locally manufactured fertilizers. It acts both as a wholesaler and as a retailer. As a wholesaler it serves the Provincial Cooperative and Marketing Unions, and as a retailer it serves mainly large-scale farmers. The Provincial Cooperative and Marketing Unions serve only as retailers. They buy fertilizer from the Board and resell it to farmers in their Provinces through a network of rural depots. With the exception of the Southern, Central, and Copperbelt Provinces--in each of which NAMBOARD runs two depots--NAMBOARD owns one depot in each Province, and it is located in the Provincial Capital. The farmers are at liberty to obtain their requirements from either the centrally located NAMBOARD depot or from the rural Cooperative Union depots. The price they pay for a bag of a given type of fertilizer at a NAMBOARD depot is fixed by the Government and is the same that they pay for it at any Cooperative depot. The farmer's decision to purchase fertilizer from a particular depot is influenced only by the distance between his farm and the depot and the services he gets. Most small-scale farmers who have no means of transport prefer to obtain their fertilizer requirements from rural depots that are close to their farms. Most large-scale farmers with reliable means of transport, on the other hand, procure their fertilizer requirements from NAMBOARD depots.

The nine Provincial Cooperative and Marketing Unions procure fertilizer from NAMBOARD at the same price that they sell it to farmers. However, the Government pays them K4.00/50-kg bag (or its equivalent) of fertilizer they handle, as a restitution fee. This enables them to meet administrative costs and the cost of distributing and selling fertilizer. This is another form of subsidy given to marketers of fertilizer. During the last 5 years the Provincial Cooperative and Marketing Unions received the following amounts of subsidy from the Government with respect to the fertilizer and grains and other crops they handled:

<u>Year</u>	<u>Subsidy in Zambian Kwacha</u>
1980	K11,558,000
1981	K25,855,600
1982	K29,918,000
1983	K36,880,000
1984	K23,500,000

The accounting system followed by the Provincial Cooperatives is such that no separation is made between subsidy received for fertilizer handling and that which is received for maize handling. So the figures shown above represent subsidies received by the cooperatives in relation to their handling of fertilizers and other

crops. Fertilizer subsidies probably represent 50%-60% of the total subsidies given to cooperatives.

The second source of fertilizer in the country is the Nitrogen Chemicals Limited (NCZ). Fertilizers supplied by NCZ are shown in Table 2. Up until 1982 the nation imported 87.5% of its fertilizer requirements. The rest was obtained from NCZ, a subsidiary of a conglomerate of State-owned companies known as Indeco (Industrial Development Corporation).

Today 21.1% of fertilizer required in the country is manufactured locally. NCZ previously (1968-82) manufactured mainly ammonium nitrate. It is now also capable of manufacturing all NPK fertilizers but is seriously constrained by a shortage of bags for packing fertilizer, storage capacity which is limited to 3 months' production, technical problems associated with the plants, high production costs, and its dependence on imported raw materials for which foreign exchange is needed.

Table 2. Supply of Fertilizer From the Nitrogen Chemicals, Ltd., 1975-83

Type	1975	1976	1977	1978	1979	1980	1981	1982	1983
"X" <sup>a</sup>	Nil	Nil	Nil	Nil	Nil	Nil	2,055.7	Nil	45,000
"R" <sup>b</sup>	Nil	Nil	Nil	Nil	Nil	Nil	3,591	12,109.6	30,000
"D" <sup>c</sup>	Nil	Nil	Nil	Nil	Nil	Nil	Nil	21,762	Nil
"C" <sup>d</sup>	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	3,000
"V" <sup>e</sup>	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Ammonium									
nitrate	11,000	15,356	26,866	23,907	25,339	18,671	14,153.8	21,153	20,000 <sup>f</sup>
TSP	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	2,000 <sup>f</sup>
Total	11,000	15,356	26,866	23,907	25,339	18,671	19,800.5	55,024.6	100,000

a. "X" grade = 20-10-5 with 12% sulfur.

b. "R" grade = 20-20-0 with 12% sulfur.

c. "D" grade = 10-20-10 with 12% sulfur.

d. "C" grade = 6-18-12 with 10% sulfur and 0.1% boron.

e. "V" grade = 4-18-15 with 10% sulfur and 0.1% boron.

f. Nitrogen Chemicals obtained this from abroad.

The production of ammonia is based on coal which is obtained locally from Maamba Coal Mines. All other important raw materials--namely, SSP, TSP, and DAP--are imported. These imports are likely to be replaced in the near future by locally produced phosphatic materials. These will come from the deposits of phosphate rock which the Government intends to begin to mine in the next 5 years.

The local production of fertilizer will continue for many years despite the numerous problems presently being faced by NCZ. There will still, however, be a place for imported fertilizer, particularly urea. The ratio of locally manufactured fertilizer to imported fertilizer is estimated at 60%:40% in the years after 1985.

Nitrogen Chemicals Limited sells fertilizers below its production costs. For the 1983/84 production year, for example, the average cost of fertilizer produced at NCZ is K844/tonne made up as follows:

<u>Type of Costs</u>	<u>Zambian Kwacha per Tonne</u>
Variable costs	K342.00
Fixed costs	<u>K502.00</u>
Total	K844.00

The average selling price is only K600/tonne. Increased capacity utilization, for instance, would reduce the unit cost per tonne.

#### Crop and Fertilizer Prices

The recommendations of crop and fertilizer prices for a particular year are made by NAMBOARD in conjunction with the Ministry of Agriculture; these recommendations must be approved by the cabinet. Fertilizer prices for 1984 are shown in Tables 3 and 4. Crop prices are shown in Table 5. Fertilizer prices have been in effect since May 4, 1984. The old (1983) prices were increased by 11% to arrive at the 1984 prices. A reduction in subsidies in 1983 led to a 61% increase in the prices over the previous year. This reduced fertilizer sales by 22%.

Table 3. Zambia: 1984 Fertilizer Selling Prices in Kwachas<sup>a</sup>

Type of Fertilizer	Per Tonne	Per 50 kg	Per 10 kg	Per 5 kg
Tobacco mixture "A" <sup>b</sup>	499.00	24.95	5.50	2.90
Tobacco mixture "C" <sup>c</sup>	529.00	26.45	5.80	3.05
Tobacco mixture "V" <sup>d</sup>	519.00	25.95	5.70	3.00
Maize mixture "R" <sup>e</sup>	535.00	26.75	5.85	3.05
Maize mixture "D" <sup>f</sup>	535.00	26.75	5.85	3.05
Maize mixture "X" <sup>g</sup>	535.00	26.75	5.85	3.05
Urea	535.00	26.75	5.85	3.05
Ammonium nitrate	517.00	25.05	5.70	3.00
Ammonium sulfate	504.00	25.20	5.55	2.90
Nitrate of soda	563.00	28.15	6.15	3.20
Single superphosphate	503.00	25.15	5.65	2.90
Triple superphosphate	569.00	28.45	6.20	3.25
Potassium chloride	475.00	23.75	5.25	2.80
Potassium sulfate	470.00	23.50	5.20	2.75
Gypsum	414.00	20.70	4.65	2.50
Mixed TSP & SSP	540.00	27.00	5.90	3.10
Lumpies	479.00	23.95	5.30	2.80
Wet	459.00	22.95	5.10	2.70
Sweepings	498.00	24.90	5.50	2.90
Nitrate of soda (25 kg) 14-10	564.00			
FAO fertilizer	487.00	24.38		

a. Effective May 4, 1984.

b. "A" grade = 2-18-15 with 10% sulfur and 0.1% boron.

c. "C" grade = 6-18-12 with 10% sulfur and 0.1% boron.

d. "V" grade = 4-18-15 with 10% sulfur and 0.1% boron.

e. "R" grade = 20-20-0 with 12% sulfur.

f. "D" grade = 10-20-10 with 12% sulfur.

g. "X" grade = 20-10-5 with 12% sulfur.

Table 4. Zambia: Fertilizer Farm Prices

Type of Fertilizer	Farm Price per 50-kg Bag	Farm Price as % of What Price Would be Without Subsidy	Remarks
Ammonium nitrate	K25.85	74.5	Locally produced
Urea	K26.75	99.3	Imported
Ammonium sulfate	K25.20	74.6	Locally produced
"X" <sup>a</sup>	K26.75	71.8	Locally produced
"R" <sup>b</sup>	K26.75	71.4	Locally produced
"D" <sup>c</sup>	K26.75	100.5	Imported
"C" <sup>d</sup>	K26.45	96.2	Imported
"V" <sup>e</sup>	K25.95	96.1	Imported
Triple superphosphate	K28.45	73.3	Obtained by Nitrogen Chemicals and later sold to NAMBOARD
Single superphosphate	K25.15	-	Imported
Potassium chloride	K23.75	-	Imported

- a. "X" grade = 20-10-5 with 12% sulfur.  
 b. "R" grade = 20-20-0 with 12% sulfur.  
 c. "D" grade = 10-20-10 with 12% sulfur.  
 d. "C" grade = 6-18-12 with 10% sulfur and 0.1% boron.  
 e. "V" grade = 4-18-15 with 10% sulfur and 0.1% boron.

Table 5. Zambia: National Agricultural Marketing Board  
Preplanting Producer Prices for 1984/85 Season

Crop	Standard Weight	Current Producer Price	Preplanting Producer Prices for
		1983/84 Season	1984/85 Season
		Grade A	Grade B
		K-	K-
Maize	90-kg bag	24.50	28.32
Sunflower	50-kg bag	21.50	27.88
S/G/Nuts (Chalimbana)	80-kg bag	71.50	91.67
S/G/Nuts (Makulu Red)	80-kg bag	65.00	65.00
U/S/G/Nuts (Chalimbana)	90-kg bag	17.85	22.92
U/S/G/Nuts (Makulu Red)	90-kg bag	17.85	17.85
Soybeans	90-kg bag	52.50	60.90
Paddy rice	80-kg bag	40.00	40.00
Wheat	90-kg bag	42.50	45.20
Sorghum	90-kg bag	18.65	26.90
Malting barley	90-kg bag	42.50	45.20
Millet	90-kg bag	29.50	38.10
Cassava	1 kg	0.20	0.30
Cotton	1 kg	0.58	0.67
Tobacco (Virginia)	1 kg	2.80	3.25
Barley	1 kg	1.80	2.09

Source: Press statement from Ministry of Agricultural and Water Development, May 1984.

The prices of fertilizers are uniform throughout the country. This means the prices charged by the cooperatives and NAMBOARD are uniform in all the depots in the country. Fertilizer use is heavily subsidized by the Government. The subsidy takes into account all the costs incurred by NAMBOARD and the Provincial Cooperative and Marketing Unions pertaining to the transportation of fertilizer and labor.

The subsidy policy has undoubtedly had a great impact on the use of fertilizer in the country. Before it was introduced only commercial farmers could afford fertilizer, but today most farmers can afford fertilizer. This has resulted in increased production of crops.

Fertilizer marketing is a Government monopoly in Zambia, and once prices are fixed they remain in force for 1 year. There are no seasonal rebates or quantity discounts given to farmers as incentives. Fertilizer subsidies range from less than 1% for urea to more than 25% for AS, AN, and TSP (Table 6). The total subsidy received by NAMBOARD has declined from K43 million in 1980 to K20 million in 1984 (Table 7). In 1984 this represents 19% of the agricultural budget compared to 41% in 1980.

Table 6. Zambia: Computation of Subsidies

Product	Handling Cost per 50-kg Bag	Total Costs to NAMBOARD	Farm Gate Prices	Subsidy to NAMBOARD
Ammonium nitrate	K3.83	K34.68	K25.85	25.5%
"C" (6-18-12 + 10% S and 0.1% B)	K3.83	K33.63	K26.45	21.4%
"R" (20-20-0 + 12% S)	K3.83	K37.48	K26.75	28.6%
"X" (20-10-5 + 12% S)	K3.83	K37.28	K26.75	28.3%
"V" (4-18-15 + 10% S and 0.1% B)	K3.83	K33.63	K25.95	22.8%
Ammonium sulfate	K3.83	K33.83	K25.20	25.5%
Triple superphosphate	K3.83	K38.83	K28.45	26.7%
"D" (10-20-10 + 12% B)	K3.83	K26.62	K26.75	-0.5%
Urea	K3.83	K26.94	K26.75	(no subsidy) 0.7%

The Government does not intend to continue this subsidy policy. During the past few years the subsidy has been gradually reduced, and it is expected to be completely eliminated by the year 1990. There are four reasons why the Government is gradually withdrawing subsidy: (a) aid donors are insisting that subsidy be withdrawn; (b) the Government is finding it increasingly expensive and difficult to maintain this policy; (c) it is no longer necessary to have subsidies because farmers recognize the importance of fertilizer; and (d) it is economically sound to have no subsidy and to charge prices as dictated by the prevailing economic climate.

Crop prices are fixed for a year for controlled products such as maize, sunflower, cotton, groundnuts, sugarbeans, and wheat, and are reviewed the following year.

Table 7. Zambia: Subsidies Received by NAMBOARD

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Price differential subsidy received by NAMBOARD, K	27,599,000	27,500,000	9,434,000	11,905,000	11,900,000
Subsidy given for fertilizer handling by NAMBOARD, K	15,821,000	10,400,000	18,691,000	8,020,000	8,200,000
Total subsidy received by NAMBOARD, K	43,420,000	37,900,000	28,125,000	19,925,000	20,100,000
The average exchange rate of Zambian Kwacha to U.S. \$	1.2270	1.1155	1.0545	0.6440	0.4905
Total subsidy received by NAMBOARD as a percentage of the agricultural budget	41.0%	41.6%	22.6%	22.3%	18.8%

## FERTILIZER SUBSIDIES IN ZIMBABWE, 1984

by  
C. D. Gael<sup>1</sup>

Fertilizer is not subsidized in Zimbabwe. Chemical fertilizers are used extensively in Zimbabwe, and a very full range of plant nutrients is available. This paper indicates that adequate economic returns for the major crops produced have eliminated the need for fertilizer subsidies.

### Historical Background

#### Fertilizer Production

The use of inorganic fertilizers in Zimbabwe goes back to the 1920s. A comprehensive range of compound fertilizers (i.e., N, P, and K) was being manufactured in Salisbury (now Harare) certainly by 1925, and by 1926 the factory produced sufficient amounts for the whole country. Special mixtures were available at that time for maize, citrus, cotton, tobacco, potatoes, groundnuts, peas, and vegetables. The cost in those days was about US \$20/short ton. All raw materials, however, were imported. A second factory was blending and packing fertilizer by 1933. A third factory was in commission by 1950.

By 1950 an awareness of the economic value of balanced levels of inorganic fertilizers had been created. The greatest advance probably took place in tobacco culture when Dr. F. A. Stinson was Director of the Tobacco Research Board of Rhodesia and Nyasaland, and the use of fertilizers on this crop soon developed to a similar level as that which is recommended today. Research by the Ministry of Agriculture into the fertilization of other crops, particularly maize, was intensive during the 1950s. In 1951 the first granulating plant was erected in Salisbury, and the other two companies in the market soon followed suit.

By 1960 the analysis of Zimbabwe soils for levels of available nutrients had reached a very sophisticated standard, and optimum levels of applied, inorganic nutrients for maximum yields and quality of crops had been developed. These levels have only changed by marginal degrees since that time, but the use has expanded enormously.

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1. Deputy Sales Manager, ZFC Limited, Harare, Zimbabwe.

Until 1965 all raw materials were imported into Zimbabwe. However, it had been known for many years that deposits of phosphate rock were situated in the east of the country, and in 1965 Dorowa Phosphates began open-cast mining into the soft phosphate rock. Approximately 125,000 tonnes of raw rock are now mined annually and transported to the Zimphos factory in Harare. The following quantities of phosphate fertilizers are now produced annually:

155,000 tonnes single superphosphate  
35,000 tonnes triple superphosphate

This production supplies all of the country's annual requirements. Because of water shortage at Dorowa over the past 2 years of drought, a certain amount of Foskor rock and triple superphosphate have had to be imported from South Africa.

In 1969 the first nitrogen fertilizer manufacturing plant was installed at Kwekwe to produce ammonium nitrate. This plant is capable of producing some 245,000 tonnes of ammonium nitrate per year, but almost half of the ammonia feedstock has to be imported. This should be rectified in the near future.

All potassium fertilizers are imported. Table 1 gives the prices of fertilizers in 1983/84.

Table 1. Zimbabwe: Fertilizer Prices, 1983

<u>Material</u>	<u>Price/Tonne (2,000 lbs) (US \$)</u>
2-17-15	196.01
4-17-15	205.02
6-17-15	206.89
8-14-7	160.99
15-5-20	179.52
5-18-10	182.07
10-10-10	156.91
10-18-0	174.08
7-21-7	200.26
25-5-5	197.37
4-17-15	198.05
20-10-5	189.55
8-14-7	172.55
Ammonium nitrate	175.78
Urea	234.26
Sodium nitrate	256.87
Double superphosphate (DSP)	227.29
Single superphosphate	122.06
Muriate of potash	164.73
Potassium sulfate	227.29

## Crops

As a subtropical country, Zimbabwe has always grown maize as the main food crop, and maize meal has been the staple diet of the indigenous people for many generations. This crop is grown even today almost entirely to feed the nation, and very little is exported except in years of large overproduction. Other major commercial food crops grown are sorghum, soybeans, groundnuts, and edible beans. These crops are grown mainly on dryland as opposed to irrigated soils. By 1965 there was very little irrigation of winter cereals, and all wheat and barley were imported. Irrigation was limited mainly to growing deciduous fruit, vegetables, and lucerne, and for supplementary summer irrigation of dryland crops during periods of poor rainfall. By 1975 some 31,400 ha of wheat was irrigated during the winter months, from May to October, and the country was self-sufficient. An average yield of 3.85 tonnes/ha was achieved. By 1982, 48,000 ha had been planted, an average of 5 tonnes/ha was obtained, and the country had a surplus of wheat.

Barley, used for malting, rose from 3,000 ha in 1975 to 6,000 ha in 1982, at which level there is an exportable surplus.

With the severe droughts in 1982/83 and 1983/84, the levels of production of these two crops have dropped as a result of a lack of irrigation water. Wheat is being grown on 17,000 ha and barley on 2,000 ha.

The main export-earning crops are Virginia tobacco, cotton, and sugar. Tobacco has been grown for many years, but it was only after the last war that the crop really expanded. In 1931/32 only 8,000 ha was grown. By 1946 this had expanded to around 20,000 ha and to 64,000 ha in 1976. The crop declined to 40,000 ha in 1980/81 but has increased again to 52,000 ha in 1983/84.

Cotton has varied from 60,000-90,000 ha over the last 10 years, depending on world prices. At present the crop is about 80,000 ha.

The sugar crop is grown entirely under irrigation in the dry lowveld region of Zimbabwe. The area was cultivated on a large scale by 1950. Today approximately 34,000 ha is grown by three large estates and some 30 outgrowers (Table 2).

## Effect of Government Programs on Crop Prices

The marketing of most major crops in Zimbabwe is carried out under strict Government control through two parastatal bodies, the Grain Marketing Board and the Cotton Marketing Board. However, tobacco is an exception, and prices are not Government controlled. Please note that all prices quoted are in Zimbabwe dollars unless otherwise indicated (Z \$100 = US \$85).

Table 2. Zimbabwe: Area Planted to Main Crops, Commercial Farms

Crop	1975	1976	1977	1978	1981	1982	1983
	- - - - - (ha) - - - - -						
Virginia tobacco	63,300	64,600	56,000	54,000	38,100	43,800	51,000
Maize	278,000	257,300	264,300	237,100	363,500	316,400	225,000
Barley	3,600	5,400	4,300	3,700	6,000	5,500	3,000
Rice	850	550	450	600	600	400	400
Sorghum	5,000	7,000	6,500	7,500	9,000	8,000	8,000
Wheat	31,000	33,500	42,000	45,000	42,000	48,000	22,000
Coffee	5,000	5,500	5,600	5,600	8,000	10,000	10,000
Cotton	92,500	64,000	82,000	94,000	66,000	58,000	82,000
Groundnuts	20,500	18,000	15,000	13,500	13,000	12,000	12,000
Soybeans	18,000	25,000	25,000	35,000	31,000	48,500	54,000
Sugarcane	23,000	25,000	26,500	27,000	34,000	34,000	34,000
Tea	4,000	4,000	4,500	4,500	5,000	5,000	5,000
Edible beans (dry)	2,500	2,500	2,500	1,500	1,000	1,000	1,000
Potatoes	1,800	1,800	1,500	1,800	1,500	1,500	1,800

Source: Crop Production of Commercial Farms, 1982, Central Statistical Office.

### Virginia Tobacco

This crop is marketed by the Tobacco Marketing Board on a free-auction system, and no Government support is given. Generally, no support is required for growers because prices give an economical return, but this has not always been the case. The growers have a very strong association that has accumulated reserve funds over the years, and these have been used occasionally to purchase growers' (members') tobacco when it fails to receive a fair price. These funds have then been replenished by a levy on tobacco sold by all growers. As a guide to the profitability of Virginia tobacco in Zimbabwe at the present time, please refer to Table 3.

### Maize

Maize is marketed through the Grain Marketing Board. Prices for the crop are announced in April each year after the crop has been grown. Prior to 3 years ago, a minimum preplanting price was announced. The last time this occurred was in 1980 when a price increase of some 40% was given. The result was a very large commercial crop for Zimbabwe of 320,000 ha, producing record yields of over 5.5 tonnes/ha due largely to excellent growing conditions. Since that year the price has only been announced after the crop has been grown, and the hectareage has declined to 190,000 ha mainly because of nonincentive prices. Largely because of drought, the average yield has dropped to 3.5 tonnes/ha, and Zimbabwe has had to import maize for the first time in many years. Prices once fixed for a crop are generally maintained for all of that selling season.

Table 3. Zimbabwe: Flue-Cured Tobacco, 1983/84

	Dryland			Irrigated		
Yield, kg/ha	1,400	1,800	2,200	2,600	3,000	3,400
Approx. 1 lb/acre	1,250	1,600	1,960	2,320	2,680	3,040
<u>Variable Costs (Z\$/ha - Z\$100 = US \$85)</u>						
Labor	735	809	882	980	1,054	1,127
Tractor expenses	239	249	260	270	280	290
Fertilizer	190	190	190	190	190	190
Lime	18	18	18	18	18	18
Herbicides	6	62	62	62	62	62
Insecticides and fungicides	180	180	220	220	287	287
Coal	105	135	165	195	225	255
Irrigation	-	-	-	75	75	75
Insurance	132	137	142	147	152	157
Building maintenance	84	108	132	156	180	204
Selling - levy	130	167	204	241	278	315
Transport	42	54	66	78	90	102
Miscellaneous	40	44	48	52	56	60
Total variable costs/ha	1,901	2,153	2,389	2,684	2,947	3,142
Gross income/ha	2,940	3,780	4,620	5,460	6,300	7,140
Gross margin/ha	1,039	1,627	2,231	2,776	3,353	3,998

Notes:

1. Labor: 300-450 labor days/ha at \$2.45/labor day. \$24/ha added for irrigation labor on yields of 2,600 kg/ha and over.
2. Tractor and machinery expenses: 185-225 liters of fuel/ha at \$1.26/liter.
3. Fertilizer: 750 kg/ha of "V"-grade and 75 kg/ha AN at 1982/83 list prices.
4. Lime: 500 kg/ha lime at \$35/tonne delivered to farm.
5. Herbicide: Trifluralin 1.1 liters/ha at lowest yield, Tillam 7 liters/ha on 1,800 kg/ha and over yields.
6. Insecticides and fungicides: standard recommended rates Methyl Bromide, fungicides, Baytan and Orthene on 72-m<sup>2</sup> seedbed area/ha. On lands: EDB, Dursban, Poutines 1 and 2, and Sukerkil. + 2 sprays Rogor on 1,400 and 1,800 yields, + 2 sprays Rogor + Dyrene on 2,200 and 2,600 yields, + Disyston + Dyrene on 3,000 and 3,400 yields.
7. Coal: coal/tobacco ratio of 1.5/liter. Dry coal at \$50.00/tonne delivered.
8. Irrigation: 500 mm budgeted for. \$15.00/100 mm water (pumping and R + M).
9. Insurances: field to floor 1.25c/kg. Hail \$114/ha.
10. Building maintenance: fire bars, tier pole, flue replacement, etc.
11. Transport: 20c/tonne/km. 150 km.
12. Miscellaneous: includes seed and other minor items.
13. Price: \$2.10/kg anticipated.

Source: J. A. Skinner, Budget Guide, ZFC, 1983.

As can be seen from Table 4, the gross margin on maize during 1983/84 was about US \$68/ha at a yield of 3.5 tonnes, or about 19% of variable costs. For a yield of 5.5 tonnes, the margin was about US \$213 or 48% of variable costs. Thus, it can be seen that on high-management farms a reasonable return can be obtained without Government subsidies.

### Cotton

This crop is also marketed through a parastatal body, the Cotton Marketing Board. Prices are fixed annually once the crop has been grown and is being reaped. Yields on dryland vary from 1.0 tonnes/ha of unginmed cotton to 1.8 tonnes. Irrigated yields vary from 2.2 tonnes/ha to 3.0 tonnes.

Referring to Table 5, it can be seen that on dryland cotton gross margins varied in 1983/84 from a loss of US \$69/ha at a yield of 1.0 tonnes to a margin of US \$220/ha at 1.8 tonnes, or 34% of variable costs.

On irrigated crops, the margin varies from US \$273/ha for a 2.0-tonne yield to US \$561/ha for a 3.0-tonne yield. These represent 34%-63% of variable costs, respectively.

Once again, no fertilizer subsidies are necessary at a high level of management.

### Wheat

All wheat is irrigated and grown only during the subtropical winter months. The crop is marketed through the Grain Marketing Board as is maize. Because wheat is reliant on irrigation water, the yield variations are less noticeable from one year to the other, but weather factors such as frost and rain at the wrong periods of growth and harvest do affect the final yields and grain quality.

The crop hectareage built up to a maximum of 45,000 ha in 1978 and can be maintained at that level if prices remain high enough and water is available. Wheat is the one crop for which prices are regularly announced before the crop is planted. In the past 2 years, water for irrigation has been very low because of drought, and in 1983 only 22,000 ha was planted. This has dropped further to 17,000 ha in 1984.

The crop yield can vary from 4.5 tonnes to 7.5 tonnes/ha, and national yields increased from 3.8 tonnes in 1975 to 5.0 tonnes in 1983 (Table 6). At 3.8 tonnes, the gross margin is US \$321 or 62% of variable costs, and at 7.5 tonnes the margin is US \$801 or 133% of costs. The crop is generally profitable under fair management despite lack of fertilizer subsidies; it is limited by land and water.

Table 4. Zimbabwe: Dryland Maize, Hand Harvested, Costs, and Returns With Alternative Yields, 1983/84

Yield, kg/ha	3,500	4,500	5,500	6,500	7,500	8,500
Approx. bag/acre	16	20	24	29	33	38
<u>Variable Costs (Z\$/ha - Z\$100 = US \$85)</u>						
Labor	89	97	104	111	119	126
Tractor expenses	95	99	103	106	110	114
Seed	10	20	20	20	20	20
Fertilizer	103	119	139	158	178	198
Lime	14	14	18	18	21	21
Herbicides	20	20	20	29	29	29
Insecticides	10	10	10	10	10	10
Transport	53	68	83	98	113	128
Miscellaneous/levy, etc.	17	21	22	24	26	28
Total variable costs/ha	411	468	519	574	626	674
Gross income/ha	490	630	770	910	1,050	1,190
Gross margin/ha	79	162	251	336	424	516

Notes:

1. Labor: 26 labor days to harvest + 3 labor days/tonne at \$2.45/day.
2. Tractor and machinery expenses: 65 liters of fuel to harvest + 3 liters/tonne at \$1.26/liter.
3. Seed: 3-way hybrid \$19.50/pocket used at 3,500 kg/ha yield. SR 52 at \$39.50/pocket used at other yields (1 pocket seed - 2 ha).

4. Fertilizer:	<u>Yield</u>	<u>Fertilizer Rate</u>	<u>Lime</u>
	-- (kg/ha) --		
	3,500	300 D + 225 AN	400
	4,500	300 D + 300 AN	400
	5,500	350 D + 350 AN	500
	6,500	400 D + 400 AN	500
	7,500	450 D + 450 AN	600
	8,500	500 D + 500 AN	600

Fertilizer prices at 1982/83 list prices.

5. Lime: \$35/tonne delivered on farm.
6. Herbicide: (a) Atrazine 50 FW - 4.5 liters/ha on 3,500-5,500 kg/ha yields, and (b) Atrazine 50 FW - 2.3 liters/ha + Lasso EC - 2.8 liters/ha on higher yields.
7. Insecticides: Cymbush - 0.125 liters/ha + Thiodan 1G - 4 kg/ha.
8. Transport: \$15/tonne.
9. Price: \$140/tonne.

Source: J. A. Skinner, Budget Guide, ZFC, 1983.

Table 5. Zimbabwe: Cotton, Costs, and Returns With Alternative Yields, 1983/84

	Dryland			Irrigated		
	1,000	1,400	1,800	2,200	2,600	3,000
Yield, kg/ha						
Approx. lb/acre	900	1,250	1,600	1,960	2,320	2,680
<u>Variable Costs (Z\$/ha - Z\$100 = US \$85)</u>						
Labor:						
preceding picking	88	88	88	88	88	88
picking, galing	110	154	198	243	287	331
irrigating	-	-	-	24	24	24
Tractor expenses	91	92	93	94	95	96
Seed	4	4	4	4	4	4
Fertilizer	74	74	74	106	106	106
Lime	7	7	7	7	7	7
Herbicides	85	85	85	85	85	85
Insecticides	65	65	65	65	65	65
Aircraft sprays	70	70	70	70	70	70
Irrigation	-	-	-	45	45	45
Transport	20	28	36	44	52	60
Miscellaneous	37	43	48	57	63	69
Total variable costs/ha	651	717	767	932	991	1,050
Gross income/ha	570	798	1,026	1,254	1,482	1,710
Gross margin/ha	-81	81	259	322	491	660

Notes:

1. Labor: 36 labor days preceding harvest, 45 labor days/tonne to pick, sort and bale at \$2.45/labor day. 10 labor days for irrigation.

2. Tractor and machinery expenses: 70 liters of fuel/ha + 2 liters/1,000 kg at \$1.26/liter.

3. Fertilizer: 250 kg of L grade and 100 kg of AN on dryland crop, 350 "L" and 150 AN on irrigated crop, at 1982/83 list prices.

4. Lime: 200 kg/ha at \$35/tonne delivered to farm.

5. Herbicides: Trifluralin at 1.6 liters/ha, Cotoran at 2.8 kg/ha, Gramoxone at 2 liters/ha, and Bladex at 2 liters/ha.

6. Insecticides: Carbaryl 85 WP - 2 sprays - 1.75 kg, Thionex 35 EC - 2 sprays - 2 liters, Cymbush 20 EC - 4 sprays - 600 ml, and Acaricide - 4 sprays.

7. Aircraft sprays: 10 sprays at \$7/spray.

8. Irrigation: 300 mm of irrigation at \$15.00/100 mm applied (pumping and R + M).

9. Transport: \$20/tonne.

10. Miscellaneous: sundries, packs, levy.

11. Price: 57 c/kg for Grade "A."

Source: J. A. Skinner, Budget Guide, ZFC, 1983.

Table 6. Zimbabwe: Wheat--Costs and Returns With Alternative Yields, 1983

Yield, kg/ha	4,500	5,500	6,500	7,500
Yield bags/acre	20	24.5	29	33.5
<u>Variable Costs (Z\$/ha - Z\$100 = US \$85)</u>				
Labor	55	55	55	55
Tractor expenses	82	82	82	82
Combine hire	60	60	60	60
Seed	43	43	43	43
Fertilizer	165	186	215	236
Lime	19	19	19	19
Herbicides	14	14	14	14
Insecticides	3	3	3	3
Aircraft spray	10	10	10	10
Irrigation	105	105	105	105
Transport	30	44	52	60
Miscellaneous/levy etc.	20	20	20	20
Total variable costs/ha	612	641	678	707
Gross income/ha	990	1,210	1,430	1,650
Gross margin/ha	378	569	752	943

Notes:

1. Labor: 25 labor days/ha at \$1.26/day (minimum wage \$50/month).
2. Tractor expenses: 65 liters of fuel at \$1.26/liter (excluding combine).
3. Contract Combining: estimated at \$60/ha.
4. Seed: \$21.60 per 50-kg pocket. 100 kg/ha.
5. Fertilizer (according to yield):

Yield	Fertilizer Rates (kg/ha)
4,500 kg/ha	600 D grade + 250 AN
5,500 kg/ha	600 D grade + 350 AN
6,500 kg/ha	700 D grade + 400 AN
7,500 kg/ha	700 D grade + 500 AN

6. Lime: 500 kg/ha at \$37/tonne delivered to farm.
7. Herbicides: MCPA at 3.5 liters/ha at estimated cost.
8. Insecticide: One spray of Rogor CE at 500 ml/ha.
9. Aircraft spray: One spray at \$10.00/ha.
10. Irrigation: 700 mm water used (includes top up irrigation) at \$15.00/100 mm water (pumping costs and R + M).
11. Transport: \$8.00/tonne.
12. Packing materials: Costs returned, not costed.
13. Miscellaneous: \$20/ha. Includes levy.
14. Price: \$220/tonne.

Source: J. A. Skinner, Budget Guide, ZFC, 1983.

## Sugarcane

The pricing structure for sugar is complex; sugar is sold through a private organization. Three large estates grow 85% of the total crop of 34,000 ha. Costs of production and margins are not generally known.

## Use of Fertilizers

Fertilizers are applied to all crops grown commercially in Zimbabwe. This is not true of crops grown in the peasant sector where application rates vary from nil to those applied on commercial farms. Table 7 gives the application rates on the major crops grown in Zimbabwe. Table 8 illustrates the usage of all fertilizers by product in Zimbabwe during the past 2 years.

Table 7. Zimbabwe: Fertilizer Application Rates for Main Crops

Crop	Compound or Straight P & K Products	Nitrogen Products	Total			
			N	P	K	S
----- (kg/ha) -----						
Virginia tobacco	700	75	60	120	105	50
Maize	360	375	160	50	36	23
Cotton	300	125	58	54	30	24
Sorghum	300	200	93	42	21	20
Groundnuts	300 + 300 CaSO <sub>4</sub>	-	20	40	20	75
Wheat	650	400	190	91	45	42
Barley	700	200	125	98	49	45
Edible beans	200	100	45	28	14	13
Soybeans	300	50	35	50	45	27
Potatoes	1,800	200	195	378	150	160
Coffee	1,100	300	268	55	220	37
Sugarcane	300	475	165	60	100	36
Tea	600	220	205	41	41	41
Vegetables	1,200	1,000	420	250	84	108

Table 8. Zimbabwe: Fertilizer Supply/Demand Statistics (March-February)

Nutrient, tonnes	1982/83				1983/84			
	Production	Imports	Consumption	Exports	Production	Imports	Consumption	Exports
N	82,275	17,740 <sup>a</sup>	88,017	-	50,850	28,780 <sup>a</sup>	81,460	-
P <sub>2</sub> O <sub>5</sub>	39,200	8,100	40,845	-	35,886	8,640	44,466 <sup>b</sup>	-
K <sub>2</sub> O	-	26,250	26,082	-	-	26,990	29,671 <sup>b</sup>	-
<u>Product, tonnes</u>								
Urea	-	31,200	22,690	-	-	30,000	22,850	-
Ammonium sulfate	-	12,300	306 <sup>c</sup>	-	-	7,400	371 <sup>c</sup>	-
Ammonium nitrate	238,477	-	168,476 <sup>c</sup>	-	185,985	-	145,415 <sup>c</sup>	-
Sodium nitrate	-	1,200	1,052	-	-	900	1,489 <sup>b</sup>	-
SSP, 18.5% P <sub>2</sub> O <sub>5</sub>	162,200	-	10,313 <sup>c</sup>	-	152,465	-	12,594 <sup>c</sup>	-
DSP, 37.0% P <sub>2</sub> O <sub>5</sub>	5,852	-	5,852	-	6,200	-	6,191	-
TSP, 47% P <sub>2</sub> O <sub>5</sub>	17,000	17,235	- <sup>c</sup>	-	34,723 <sup>d</sup>	-	- <sup>c</sup>	-
Potassium chloride	-	35,000	5,858 <sup>c</sup>	-	-	33,850	6,746 <sup>c</sup>	-
Potassium sulfate	-	10,500	526 <sup>c</sup>	-	-	13,357	720 <sup>c</sup>	-
Potassium nitrate	-	-	-	-	-	-	-	-
10-18-0	7,334	-	7,334	-	3,718	-	3,718	-
7-21-7 (replaced 6-17-6)	14,916	-	14,916	-	18,003	-	18,003	-
25-5-5	1,676	-	1,676	-	4,138	-	4,138	-
20-10-5	3,227	-	3,227	-	1,931	-	1,931	-
2-17-5	3,899	-	3,899	-	3,170	-	3,170	-
4-17-5	11,529	-	11,529	-	13,355	-	13,355	-
6-17-5	26,529	-	26,529	-	36,729	-	36,729	-
8-14-7	117,074	-	117,074	-	118,645	-	118,645	-
15-5-20	5,068	-	5,068	-	7,535	-	7,535	-
5-18-10	28,081	-	28,081	-	38,209	-	38,209	-
10-10-10	28,540	-	28,540	-	20,792	-	20,792	-

a. Reflects imports of ammonia for use in local ammonium nitrate plant. Not accurately reflected in 1982/83 figures.

b. Anomalies created by carryover stocks from 1981/82 year.

c. Indicates sales of straights only and excludes consumption in manufacture of mixtures.

d. Indicates effect of importing raw rock and H<sub>2</sub>SO<sub>4</sub> rather than triple superphosphate.





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