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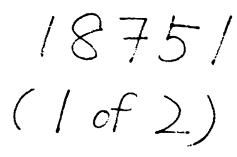
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<u>Volume I</u> (Main Report--Final)

Fertilizer Plant Feasibility Study-Haiti

Prepared for

United Nations Industrial Development Organization (UNIDO)

and

United Nations Development Programme (UNDP)

UNIDO Contract No. 90/028/GYL UNIDO Project No. DP/HAI/89/033

Prepared by

International Fertilizer Development Center (IFDC) Muscle Shoals, Alabama, U.S.A.

IFDC Contract No. 00926/90

October 1990

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Notes

- All weights are expressed in metric units and indicated as "tonnes",
 "t", or "kg". In some very special cases (for example, Table 3-9) short
 tons (2,000 pounds), and pounds "lb" are used but these units are
 clearly indicated.
- All financial calculations are expressed in 1990 U.S. dollars (US \$).
 Where Haitian dollars are used they are indicated as H \$.
- 3. The official exchange rate is H \$1.0 is equal to US \$1.0. However, the current exchange rate (shadow exchange rate) is H \$1.5-to-US \$1.0. The shadow exchange rate is used in all calculations.
- 4. Volume I contains the project rationale, description, and findings. Volume II contains the appendixes referenced in Volume I.

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FERTILIZER PLANT FEASIBILITY STUDY -- HAIT!

EXECUTIVE BRIEF

This study deals with determining the feasibility of establishing a fertilizer mixing (blending) and bagging plant in Haiti. The proposed plant would be owned and operated by a private-sector Haitian company. The objective of the company is to provide a cost-effective package of fertilizer products and related services to the Haitian farmer thus helping to increase food production and generally increase the productivity of the agricultural sector. As Haiti has no commercial fertilizer resources, all fertilizer materials required from the proposed project would have to be imported.

The fixed capital investment required for the project is small by most commercial standards, ranging from about US \$0.7 million to US \$0.9 million depending upon the level of mechanization selected. In either case, the fixed investment has little impact on the total production cost of the proposed fertilizer products or the financial feasibility of the project because the cost of imported fertilizer raw materials represents the overwhelming recurring cost of production. Raw materials alone, account for 80%-90% of the factory-gate cost of production.

The project is not financially feasible according to the assumptions used for this study. Therefore, the project is not recommended for implementation unless the indicated margin between the cost of production and factory-gate selling price can be increased. An increase in the margin of about H \$35/t (about US \$23/t) over and above the expected margin assumed for this study is required to achieve the desired internal rate of return of 15% over the life of the project.

It may be possible to achieve the increased margin through a number of efforts, the two most significant being (1) optimization of raw material procurement and transport to decrease the landed cost of imported raw materials and (2) an increase in the factory-gate selling price through development of a dealer network that would decrease dependence upon the existing importers as dealers, since these importers demand discounts which

amount to about H \$30/t. Of course, the likelihood of increasing the margin by developing a special dealer network is uncertain and will require additional investment and operating costs.

Despite the lack of financial feasibility, the proposed project embodies a number of possible benefits to the Haitian agricultural economy, namely:

- The development of a domestic industry that will create gainful employment for an extremely poor and underutilized workforce.
- An improvement in the security of supply and relative price stability for fertilizer products which are essential to the increased growth and productivity of the Haitian agricultural sector.
- The creation of a responsible agroservice company that, in addition to supplying high-quality (physical and agronomic) fertilizer products and other essential inputs, would provide an urgently needed package of technical services to help ensure that fertilizers and other inputs are used in a cost-effective way, thus increasing agricultural production and improving the economic status of the Haitian farmers and farm workers who account for about 75% of the nation's workforce.
- Stimulate increased competition among the existing importers thus helping to improve product availability, product quality, price stability, and the level of services provided to dealers and farmers.
- Ensure the evailability of a more appropriate line of high-quality fertilizer products designed for specific crops and agroclimatic conditions.
- Create a general improvement in the credibility of the fertilizer supply sector, thus helping in the formulation and implementation of technically sound and responsible government agricultural policies.

In order to provide a more sound basis for taking an investment decision on the proposed fertilizer plant project, the following investigations and evaluations are proposed. These activities will help to strengthen the agricultural sector even if the proposed fertilizer plant project is not implemented.

Raw Material Procurement—Because raw materials represent 80% or more of the cost of production, methods for decreasing the landed cost of raw materials should be confirmed. The most likely method is to exploit the possible economics of raw material procurement and transport that could accrue if participation of the potential partner from the Dominican Republic can be confirmed and some type of cooperative agreement for raw material procurement and ocean transport could be arranged. Such an arrangement would take advantage of the large tonnage procurement and transport procedures practiced by the potential Dominican Republic partner, thus resulting in a lower landed cost of raw materials to the Haitian plant site.

<u>Pricing Structure</u>--Confirm a product pricing structure (f.o.b. factory gate) that is attainable in both the short term and long term, including the dealer incentives and costs that will be required to achieve the required margin between production cost and selling price.

Other Agricultural Projects--Determine the status and confirm the scheduled completion of other agricultural projects, particularly irrigation, to more precisely predict total fertilizer market demand and market share.

Supportive Technical Assistance—Determine scope, cost, and sources of technical input and funding for supportive assistance projects that will enhance the objectives of this project as well as those of the total agricultural sector. The most urgently needed assistance projects include (1) dealer training and development, (2) one or more soil and plant tissue testing laboratories to help determine optimum fertilizer recommendations, (3) short-term credit programs to assist dealers establish warehouse facilities and stock fertilizer products, and (4) an evaluation of the agricultural input-output pricing structure to assist the Government of Haiti in formulating effective policies to promote fertilizer use and increase agricultural productivity. This last activity should be given the highest priority as it will provide valuable input to an urgently needed government agricultural policy.

<u>Note</u>

This study was performed according to the UNIDO Guidelines for Preparation of Industrial Feasibility Studies. The layout of the ensuing report, beginning with Chapter 1.0 Executive Summary and ending with Chapter 10.0 Financial and Economic Evaluation conforms to these Guidelines.

1.0 EXECUTIVE SUMMARY

1.1 Introduction

This project deals with the establishment of a fertilizer mixing (blending) and bagging plant in Haiti. The proposed plant would be owned and operated by a private-sector Haitian company. The objective of the company is to provide a cost-effective package of fertilizer products and related services to the Haitian farmer thereby helping to increase food production and generally increase the productivity of the agricultural sector. Since Haiti has no significant domestic sources of fertilizer raw materials, essentially all materials required from this project will be imported.

In addition to supplying fertilizer products to the Haitian agricultural sector, the project will provide a package of services, particularly technical assistance to dealers and farmers, to ensure that the correct products are used in the most cost-effective way. This technical assistance activity currently is lacking in Haiti and poses a major constraint to increased fertilizer use, improved crop production, and an enhanced quality of life for the resource-poor Haitian farmers and farm workers who currently account for about 75% of the nation's workforce.

The proposed project design takes into consideration a number of practical local factors including:

- 1. An extremely resource-poor population.
- 2. A high level of instability at all levels of government.
- 3. Severe constraints on the availability of foreign exchange.
- 4. A relatively small and unstable market for fertilizer.
- 5. A severe shortage of technical assistance relative to fertilizer use and crop production.
- 6. The potential for strong competition from established importers currently supplying the Haitian fertilizer market.
- 7. The need for reliable supplies of high-quality and agronomically appropriate fertilizer products at stable prices to help stimulate fertilizer use and increased crop production.

1.1.1 Project Promoter/Initiator

The proposed project is being promoted by a Haitian entrepreneur. While the equity participation in the company is not clear at this time, it is quite likely that, in addition to the promoter, private-sector principals of the Dominican Republic fertilizer industry (a major current supplier of imported fertilizers to Haiti) and a group of Haitian investors will be involved. Borrowed funds are likely to be obtained from Société Financière Haïtienne de Développement S.A. (SOFIHDES) and offshore funding sources.

In addition to financial equity, the equity partners are expected to bring to the proposed company (1) managerial and fertilizer marketing skills; (2) technical skills relative to procurement of fertilizer materials, blending plant operation, transport and logistics; and (3) business acumen pertinent to the region.

1.2 Project Background and History

1.2.1 <u>Historical Development</u>

This proposed project is in part an outgrowth of an earlier initiative taken by a Canadian entrepreneur who established a fertilizer blending plant in Haiti in 1981. The blending plant was operated under the corporate name of Agricultural Services S.A. (ASSA). The company flourished for a few years and then, due to a number of internal and external problems ceased operation in May 1987. ²

The promoter of this current project was one of ASSA's major fertilizer dealers for a period of about 3 years and thus is aware of the potential benefits that fertilizers could offer to the Haitian farmer, provided they could be supplied in the correct nutrient mix at a competitive price along with a package of technical services that would ensure their cost-effective use thus leading to farmer acceptance and farmer loyalty.

^{1.} Mr. Jean-Michel Cherubin, P.O. Box 13372, Delmas, Port-Au-Prince, Haiti.

^{2.} International Fertilizer Development Center (IFDC). 1990. "Supplying Quality Multinutrient Fertilizers in the Latin American and Caribbean Region-Emphasizing Bulk Blending and the Complementary Role of Granulation," IN NPK Workshop Proceedings, Special Publication IFDC-SP-14, IFDC, P.O. Box 2040, Muscle Shoals, Alabama, 35660.

With the financial assistance of UNIDO/UNDP, a study to evaluate the feasibility of establishing a new fertilizer-blending and bagging plant in Haiti was solicited by UNIDO/UNDP in February 1990 on behalf of the current promoter. The International Fertilizer Development Center (IFDC) with Headquarters in Muscle Shoals, Alabama, U.S.A., was selected to perform the study. IFDC began field evaluation/data collection work in Haiti June 4, 1990.

1.2.2 Other Studies and Investigations

In 1985 ASSA was contemplating relocation and expansion of their blending plant. This relocation and expansion plan was designed to decrease the cost of production and delivery of fertilizer to the major farming areas and to better facilitate the servicing of a growing market for ASSA fertilizer products. A study, funded by the Canadian International Development Agency, was performed by a Canadian firm--Hatch Associates Limited (Hatch) of Toronto. Hatch subcontracted a portion of the fertilizer plant process design study work to IFDC. The study was completed in January 1986 about the time when ASSA was undergoing a severe financial crises and the Duvalier Government collapsed. Since that time no action has been taken on implementation of the ASSA plant relocation and expansion project, and ASSA closed its business in mid-1987.

The actual commercial experience of ASSA as well as the Hatch Study showed that a significant potential market for fertilizer exists in Haiti. However, in view of the severe technical, financial, and political constraints of the country, the development of this market will require a unique mix of practical, technical, commercial, and financial skills in addition to supportive government policies. The required skills and other unique features of the proposed project are more fully elaborated in this study.

^{3.} UNIDO Contract No. 90/028/GYL; Project No. DP/HAI/89/033; accepted by IFDC May 31, 1990, IFDC Contract No. 00926/90.

^{4.} Hatch Associates Ltd. 1986. Engineering & Financial Analysis, Volume I--The Report, and Volume II--Appendices and Drawings, Toronto, Ontario, Canada.

1.3 Market and Plant Capacity

1.3.1 Current Market Demand for Fertilizer

<u>Data Base</u>--Because of the long-term disturbed economic and political situation in Haiti, little reliable data, relative to the agricultural sector and particularly fertilizer use, are available.

In the absence of reliable secondary data, primary data were collected and analyzed to determine the fertilizer market. The data were generated by examination of records and/or documents available at entry points of supply into the country. The data were cross-checked with the major sources of supply, particularly the Dominican Republic. Consumption areas and market shares of the various importers were determined and evaluated by in-country observations and interviews with importers, dealers, small-holders and plantation farmers, private- and government-sector technicians, and operating personnel.

Agricultural Resource Base--By most economic norms Haiti is one of the poorest countries in the world; its people are the poorest in Latin America. The contrast in wealth is stark. The wealthiest 1% of Haitians account for 44% of national income. Of the 6.5 million population, most live in the rural areas and about 75% earn the equivalent of only one-sixth of the US \$352 national average per capita income; and this continues to decline. Out of a work force of 2.4 million, 80% are unemployed or not working in paying jobs. Women dominate the transport and marketing of farm produce.

About two-thirds of the country is rough, mountainous terrain, unsuitable for cultivation. Out of the total land area of 27,750 $\rm km^2$, only about 40% or 1.1 million ha is arable. The climate is tropical, but generally semiarid.

Agriculture, which is the main economic sector, has steadily declined as a result of severe deforestation, soil erosion, low soil fertility, primitive crop production methods, and the lack of a defined national agricultural policy. Crop production in rice, maize, and sugarcane is inadequate to supply domestic demand. The problems in food production are complex and require a serious and sustained commitment by the Government together with appropriate outside assistance. One positive step to improve agricultural production is the establishment and operation of a local fertilizer supply industry, the subject of this study.

Land Use--The major agricultural areas and the corresponding principal crops are shown in Table 1-1. Accurate data on the irrigated area are not available. The major irrigated area is the Artibonite Valley. The estimated total irrigated area in 1984 was about 74,000 ha. There has been no assessment since then, but it is evident that the total irrigated area has declined considerably during the past 6 years because of poor maintenance, deterioration of the irrigated land structure, and a reduction of the water source as the result of deforestation and silting of the irrigation canals by severe soil erosion. Observation of the irrigated areas shows that efficiency of water use in the systems is below 70%. Since rice farming, the principal irrigated crop, is practically done by hand, the distribution and control of water in the irrigated areas is very inefficient.

Role of Agriculture--As previously indicated, about 40% or 1.1 million ha is utilized for the cultivation of various crops. In 1988, about 75% of the working population was engaged in agriculture, forestry, and farming but they provided only 32% of the country's gross national product. The production of agricultural commodities provided a livelihood for about 70% of the population in 1989. One-third of the peasants have no land, while the remainder own only about 1% of the land. Exclusive of the large farms, there are about 620,000 small-scale farms of which 95% are well below 1-ha size. About 60% of the arable area is cultivated in rice, plantain, maize, sorghum, potatoes, cassava, taro, and yams, which are the principal food crops of the country.

<u>Fertilizer Consumption</u>--Fertilizer consumption in Haiti decreased from about 16,000 t of product in 1985 to about 13,000 t in 1989.

The major factors attributed to the decrease in consumption are:

- 1. Low farm-gate prices for farm produce, particularly rice, where 65% of the fertilizer is consumed.
- Delays in importation of fertilizer thus limiting the timely supply in the marketplace.
- 3. Lack of credit in the marketplace; most transactions are performed on a cash basis.
- 4. Political instability of the country. Since the revolution in February 1986, the country has operated under a provisional government with very unstable political conditions.
- 5. Lack of post-harvest marketing and distribution facilities.
- 6. Very poor crop production practices.

Fertilizer consumption from 1985 to 1989, by product and nutrient, is shown below.

Fertilizer					
Product	1985	1986_	1987	1988_	1989
			(t) -		
Urea	9,623	9,043	7,942	7,853	7,729
Ammonium sulfate	802	754	662	654	644
20-20-10	321	301	265	262	258
12-12-20	4,811	4,521	3,971	3,927	3,221
Composite ^a				•	,
(14-14-20)	481	452	<u>397</u>	393	1,031
Total	16,038	15,071	13,237	13,089	12,883
Nutrients	1985	1986	<u>1987</u>	1988	1989
N	5.304	4.984	4,377	4,328	4,273
P2O5	709	666	585	579	582
K20	1,090	1,025	900	890	<u>876</u>
Total	7,103	6,675	5,862	5,797	5,731

a. 14-14-20 is composite average nutrient analysis of miscellaneous products.

<u>Consumption by Agricultural Area</u>--The 1989 fertilizer consumption pattern by major agricultural area is summarized as follows:

		<u>Fertiliz</u>	er Consumption
		7 of	Total
Consumption Area	Crop	<u>Total</u>	Product
			(t)
Artibonite Valley	Rice/onions	65	8,373
Leocane	Maize/industrial tomatoes	2	258
Kenscoff	Vegetables (all kinds)	12	1,546
Foret des Pins	Vegetables (potatoes/ onions/cabbage)	7	902
Cul de Sac	Tobacco/industrial tomatoes/vegetables	6	773
Les Cayes	Sugarcane/rice/maize/ tobacco	5	645
Cap Haitien/others	Sugarcane/citrus/coffee vegetables/onions	3	386
TOTAL		100	12,883

1.3.2 Fertilizer Market Forecast (Total)

The market data obtained during the field study covered a period of 5 years, 1985-89, and showed that fertilizer consumption in Haiti has declined during the period for the reasons already discussed. A market segmentation method of forecasting was used for projection of fertilizer demand taking into consideration the limited amount of reliable data.

The decline in fertilizer use leveled off in 1988 and 1989. Use data for the first half of 1990 showed more or less the same level as the first half of 1989. This indicates that fertilizer consumption in the country may continue at the same level through 1991 unless significant changes occur in the factors affecting the fertilizer market. Political stability in the country can only start after the scheduled election in November 1990, and 1991 will serve as the transition year for the new government. An increase in stability can be expected to have some positive impact by 1992. Based on this rationale, the fertilizer market in 1991 is assumed to be the same as 1989 and is used as the fertilizer market base year for this study.

On the basis of assumptions more fully described in Chapter 3, a summary of the total market forecast for fertilizer use by crop segment follows:

				Fe	rtilizer	Use (proc	iuct ba	S15)				
	1991	(Base)	1	992		993		94	19	195	199	6
Crop Segment	<u> </u>	t_		<u> </u>		t	1	t_	<u>z</u>	t	1	t
Food crops Industrial crops	92 8	11,852 1,031	90 10	12,062	87 13	12,134 	85 15	12,342	85 _15	13.057	85 15	13.932 2,458
TOTAL	100	12,883	100	13,402	0	13,947	100	14,520	100	15,361	100	16,390

1.3.3 Total Projected Sales Forecast and Market Share for Proposed Project

The foregoing evaluation of Haiti's existing fertilizer market was conducted to establish a benchmark for formulating the proposed project's 5-year sales forecast (market share) and marketing plan for 1992-96. The projected sales forecast for the project takes into account (1) the current fertilizer supply scheme, (2) existing marketing channels, and (3) domestic

and foreign competition. The main elements of these three factors are briefly described.

Current Fertilizer Supply--All commercial fertilizer products are currently imported. The complex NPK grades and part of the urea fertilizers are sourced from the Dominican Republic while the balance of the urea is sourced from Trinidad, Venezuela, and Guyana. Among the complex NPK grades, 12-12-20 is preferred, supplying 30% of consumption. Granular urea from Trinidad is preferred over the prilled material from Venezuela and Guyana. The annual Japanese fertilizer donation normally consists of a 60:40 mix of nitrogen fertilizers (urea and ammonium sulfate) and complex NPK grades.

<u>Marketing Channels</u>--The following marketing channels are used for handling imported fertilizers in Haiti:

- Channel A--Fertilizer is channeled from supplier, to importer, to dealer, to small farmer.
- Channel B--Fertilizer is channeled from supplier, to importer, to dealer, to merchant, to small farmer.
- Channel C--Fertilizer is channeled from supplier, to importer, to the branch store of importer, to small farmer.
- Channel D--Fertilizer is channeled from supplier, to importers who are direct users (large farmers and plantations).

Competition--Fertilizer competition in Haiti exists in three forms:

(a) the fertilizer companies from the Dominican Republic that export to Haiti and monopolize the commercial NPK blend market and part of the urea market,

(b) the Haitian fertilizer companies that import all their NPK grades and part of their urea fertilizer needs from the Dominican Republic, (these companies represent 54% of Haiti's yearly fertilizer requirement), and (c) direct imports (by large farmers and plantations) of urea fertilizer from Trinidad, Venezuela, and Guyana. The local companies also participate in the sale of the yearly Japanese fertilizer donation. The donor tonnage currently represents 31% of the supply. The sources of fertilizer supply for 1989 are shown below:

	Quar	ntity
Source (1989)	Share	Volume
	(%)	(t)
Dominican Republic	54	6,957
Trinidad/Venezuela/Guyana	15	1,826
Japan (donation)	_31_	4,100
TOTAL	100	12,883

Sales Forecast for Project--Given the foregoing total Haitian market demand, the market share for the proposed new fertilizer plant project is expected to grow from 30% to 65% during the first 5 years of operation as shown below:

Project Sales Forecast (t product)

	Commercial Ma	irket	Japanese Donation	Total	
Year	2 Project Share	t	20% Project Share (t)	Project <u>Sales</u> (t)	
1992 1993 1994 1995 1996	30 45 55 65	3,271 5,151 6,611 8,360 9,029	500 500 500 500 500	3,771 5,651 7,111 8,860 9,529	

A breakdown of the total projected annual sales by product is shown below:

Product	1992	1993	1994 (t)	1995	1996
Urea Ammonium sulfate	2,451 57	3,560 113	4,409 142	5,316 177	5,527 191
20-20-10 12-12-20 14-14-14	94 980 189	113 1,582 	142 2,062 356	177 2,658 <u>532</u>	191 3,049 572
TOTAL	3,771	5,651	7,111	8,860	9.529

1.3.4 Urgently Needed Support Programs

To bring about the proposed fertilizer plant project sales objectives and accrue the national benefits of an integrated agroservice industry in Haiti (this project and others), the following foreign assistance programs are urgently needed.

- Soil and tissue testing laboratory and staff to support cost-effective fertilizer recommendations.
- Fertilizer and agroservice dealer training and dealer network development.
- 3. Farm-level extension/education programs to promote cost-effective fertilizer use
- 4. On-farm demonstrations and field days to show benefits of fertilizer use.
- 5. Agricultural input/output pricing study to guide government agricultural policymaking.

1.4 Materials and Inputs

1.4.1 Fertilizer Material Terminology

In the context of this fertilizer plant project, the terms materials, raw materials, and products are used interchangeably depending upon the context in which they are discussed. For example, urea, a fertilizer material, is also referred to as a raw material when it is mixed with other materials to prepare a multinutrient-blended product such as 14-14-14, and finally, it is called a product when it is simply bagged and sold as a straight material.

1.4.2 <u>Selection of Fertilizer Materials</u>

Required Fertilizer Material Physical Properties--Since the fertilizer materials used in this project will often be used to prepare blends of two or more individual materials to achieve a number of nutrient ratios and grades required by the market, it is important that the particle (granule) size of the individual materials be reasonably uniform to facilitate uniform mixing (blending) and to minimize the risk of separation of the individual materials (segregation) after the product is mixed and bagged.

The use of granular materials as opposed to nongranular materials (often referred to as standard-grade materials) is also often preferred when the materials are sold as "straights" without first blending. This is because granular materials are generally quite free-flowing and nondusty thus facilitating handling and application. Many standard-grade products, because of their large surface area, have a tendency to cake and form hard !umps during storage making them more difficult for the farmer to handle and apply.

Some products, particularly urea, are also available in a prilled form. Prilled urea is smaller in particle size than granular urea. In most cases, the prilled product is more likely to cake than the granular counterpart. Also because of its smaller particle size (usually about 1-2 mm), prilled urea is not well suited for blending because the other granular materials (for example, phosphate and potash materials) are significantly larger in size.

1.4.3 Sources of Fertilizer Materials

All fertilizer materials for the project must be imported, therefore, it is essential that all specified materials are widely available on the international market to ensure competitive f.o.b pricing and security of supply. Fortunately, the materials required for this project meet this criterion and can be sourced from the U.S. Gulf Coast, Trinidad, Venezuela, and even Europe and the Far East.

1.4.4 Other Material Inputs

In addition to the basic fertilizer nutrient materials, the project will require recurring expenses for the following materials and utilities:

- Nonnutrient granular filler material to adjust the nutrient concentration of the blended NPK products to the guaranteed value. This material will be obtained from local sources.
- Finely powdered clay to provide a conditioning agent for the NPK blends and some of the straight materials to minimize caking. This material will be imported in 25-kg bags.
- 3. Empty 50-kg capacity bags, plastic bag liners, wire ties, and stitching thread for packaging the fertilizer products. These materials will be purchased from local sources.

- 4. Diesel fuel for emergency/standby electric power generator and plant mobile equipment. All fuel and lubricants will be obtained from local sources.
- 5. Electric power for operation of all plant facilities and security lighting will be obtained from the public utility service.

1.4.5 Fertilizer and Other Material Input Quantities

<u>Fertilizer Materials</u>--A determination of the quantity of fertilizer materials required for the project was made on the basis of (1) a product slate consisting of three blended NPK products and two straight nitrogen products and (2) annual projections of market share over a period of 15 years.

The annual material requirements for the 15-year project life are summarized in Table 1-2.

Other Inputs

In addition to fertilizer materials, the project will require electricity, water, fertilizer bags, fuel, and miscellaneous operating supplies as described below.

Electricity--The project will require a total demand of about 100 kW of electric power based on 1.5 times the connected load of about 70 kW. The indicated demand (100 kW) will allow for the future expansion of the warehouse and the gradual replacement of manual operations with mechanized operations.

Electric power for the project will be obtained from the local public utility. Provisions have been made in the investment estimates to bring the public utility supply to the factory site. In addition to the public utility supply, the project is equipped with an emergency 75-kW diesel-driven electric power generator. This generator will be used to power the facility when the public utility supply is interrupted.

Water--Since selection of the project site has not been finalized, the water supply source is uncertain. The plant process operations require essentially no water. However, a significant amount of water will be needed for the worker's washing facilities and for drinking. For the purpose of the project estimates, it is assumed that all water for washing and drinking will be collected from rain and stored in a cistern located on the factory site. Treatment facilities will be provided to ensure that the water is safe for human consumption.

<u>Bags</u>, <u>Fuel</u>, <u>and Other Supplies</u>--Empty 50-kg capacity woven polypropylene fertilizer bags, plastic bag liners, bag stitching (closing) thread, diesel fuel, and miscellaneous operating supplies, such as lubricants and employee safety equipment, will be purchased from local sources.

1.5 Location and Site

1.5.1 General Location Criteria

The location of the proposed fertilizer plant is critical to the success of the project. The essential location criteria include:

- Direct access to deep and calm water to facilitate receipt of all imported raw materials by ship.
- Close proximity to the major agricultural areas to minimize land transport of fertilizer products and thereby maintain a competitive delivered cost structure.
- Close proximity to one or more population centers to benefit from developed infrastructure that is normally associated with such population centers.

1.5.2 Specific Site Features

According to these general location criteria, three potential sites were considered and the site known as Shada was selected as the basis for this study (refer to Figure 5-1).

The Shada site is located directly on the sea about 20 km south of St. Marc. The national highway passes within 1 km of the site. The site was originally developed for a plant that extracted oils from plants and seeds for use in the cosmetic industry. The oil extraction plant has been defunct for several years. At present, the site is being leased by an entrepreneur from the United States and the buildings have been refurbished and are being used for the manufacture of hand-embroidered cloth.

In addition to the space required for the embroidered cloth operation, the Shada site has co-siderable unoccupied space; the site is level and has direct access to sea and land transport. An important feature of the site is a partially completed wharf that could be rehabilitated to complement the proposed raw material unloading scheme.

1.6 Project Engineering

1.6.1 General Layout

The proposed fertilizer blending and bagging project is basically one of solid material handling, mixing, and bagging using 50-kg plastic-lined open-mouth bags. The major elements of the process consist of:

- 1. Unloading of imported fertilizer materials from ocean-going ships which may be moored to an offshore anchorage or shoreside wharf.
- 2. Inloading of the fertilizer materials into a bulk storage warehouse fitted with partitions to prevent cross mixing of the different materials.
- 3. Reclaiming of bulk materials from storage and either weighing and mixing them to achieve the desired grade/nutrient ratio (the blending process) or simply bagging straight materials. In all cases, all blended or straight materials are bagged before dispatch.

Project engineering and financial data are developed for two plant scenarios. One scenario, referred to as the "simple plant," is designed to hold the fixed investment to a minimum level and maximize the use of variable-cost contract labor in an effort to minimize risk with regard to the fixed costs of production; the second scenario, referred to as the "optimum plant," is designed to lower the total cost of production by using a higher level of mechanization and therefore fixed investment, and a lower level of variable-cost contract labor. A more complete analysis of the operational and financial advantages and disadvantages of each of these scenarios will be needed to determine the optimum implementation strategy. Assuming the project is implemented, it is likely that favorable elements of each scenario will be exploited according to a phased investment strategy dictated by the market situation.

1.6.2 Description of Blending and Bagging Process and Equipment

Blending--In the blending process for the optimum plant scenario, raw materials are reclaimed from bulk storage using a motor-driven, front-end loader. The material is dumped into a lump breaker. This unit is used to crush lumps that normally form during storage. The lump breaker is designed to gently crush lumpy material while inflicting only a minimum amount of damage to the granules.

The material from the lump breaker is transferred by a bucket elevator to a multicompartment hopper system (cluster hopper) located above the blending equipment. The capacity of the bucket elevator is much greater than the average capacity of the blending unit since it is usually fed on an intermittent basis and must therefore be designed to accommodate short-term surges.

The raw material proportioning (weighing) and mixing steps are performed on a batch basis. Manually operated discharge gates on the cluster hopper are used to sequentially discharge (by gravity) the various raw materials into a weigh hopper located below the cluster hopper unit. After the total batch is weighed, the batch of materials is discharged into a mixer. After an appropriate period of mixing, the material is discharged and conveyed to one of three manual bagging hoppers.

If only bagging is required, the reclaimed material is fed to the lump breaker as previously described but the batch weighing and mixing equipment is bypassed and the material is fed directly to the manual bagging hoppers. If a conditioning agent must be added to a straight material to minimize caking, this can be done by routing the material through the batch weighing and mixing system as with conventional blending.

In the simple plant scenario, the elevated cluster hopper and gravity-fed batch weighing operation is replaced with a more simple ground-mounted weighing system that is fed directly with the front-end loader. While this simple system is less costly to install, it requires more time and care to properly weigh a batch of material prior to mixing.

Bagging--A manual bagging system is used with both plant designs. The manual bagging system consists of three portable bagging hoppers that are filled by positioning a swivel spout over the appropriate hopper. The hoppers may also be filled directly using the front-end loader. Portable platform scales are located beneath each hopper and the operator fills plastic-lined, open mouth-type 50-kg bags by operating a manual discharge gate (filling spout) while observing the platform scale beam balance indicator. The filled bags are closed by first tying the plastic liner with a rubber band or plastic-coated wire tie. The outer bag (jacket), usually made of woven polypropylene, is stitched closed using a hand-held electric sewing machine.

1.6.3 Civil Engineering Works

The following major civil works will be required:

- Rehabilitation and expansion of existing wharf to facilitate unloading of fertilizer raw materials.
- Construction of a bulk raw material storage building including an area for the process plant (blending and bagging machinery and equipment) and bagged product storage and dispatch (truck loading).
- Construction of a maintenance workshop with space allocated for storage of machinery and equipment and special products (agricultural chemicals and implements).
- 4. Construction of an office and showroom complete with an underground cistern for collection and storage of potable water.
- 5. Installation of plant yard and security lighting.

The most significant civil works cost item is for bulk material storage. In the simple plant scenario, a total bulk product storage area of 1,200 m² is assumed in addition to the space (about 300 m²) required for the blending and bagging system and for bagged product storage and truck loading. The 1,200 m² area dedicated for bulk storage, less 30% to allow for a material reclaiming work aisle, is sufficient to store approximately 3,000 t of material provided divider partitions are used and care is taken to fill the individual bins to capacity. Likewise, with the optimum plant scenario, the 2,000 m² bulk material storage area (2,300 m² total) will be sufficient to store about 5,000 t of bulk material. In all cases the storage building will be designed to facilitate future expansion by adding to its length.

1.7 Plant Organization and Overhead Costs

Due to the relative simplicity of this project and the low level of staffing, the only overhead cost specified is for the recurring annual land lease.

1.8 Manpower

The full-time project staff is divided into two major groups:

(1) general administration and sales and (2) production. A description of the duties and responsibilities of these two staff categories follows.

General Administration and Sales--This staff consists of 12 full-time employees and is headed by the president-general manager, who is responsible for the entire project. This staff carries out the following major functions:

- 1. Procurement and scheduling of all raw material and production inputs.
- Marketing and sales, including technical assistance and services to dealers and farmers.
- 3. Scheduling of plant production program.
- 4. Dispatching of all products to dealers and other approved accounts.
- 5. Accounting, credit, and related financial activities.
- 6. Payroll, insurance, bookkeeping, and general administration.
- 7. Plant security, safety, and public relations.

<u>Production</u>--This staff, consisting of 7 full-time employees, is headed by a plant superintendent, who reports directly to the president-general manager. The production staff is responsible for material unloading, warehousing, blending and bagging, maintenance, and all other production-related activities including the procurement of short-term contract labor and services.

A summary of the full-time project staffing is shown below.

Project Staffing

	Number
Administration and Sales	
President and general manager	1
Technical sales representative	1
Finance manager/accountant	1
Cashier/bookkeeper	1
Secretary	1
Messenger	1
Security (guard)	_6
Subtotal	12
Plant Operations (Direct Labor)	
Plant superintendent	1
Foreman/operator	ī
Mechanic/operator	1
Operator	2
Laborer (bag hauler)	_2
Subtotal	7
TOTAL	19

a. President and general manager also serves as marketing manager.

1.9 Implementation Scheduling

A 1-year timeframe is estimated for the engineering, procurement, and construction of the facilities required for the project. Assuming project approval, including financing, is obtained by late 1991 and the appropriate company structure is formed, the plant will be ready for commercial operation in the beginning of calendar year 1992.

b. Additional short-term contract labor may be needed from time to time to cope with peak periods of fertilizer demand and plant production.

1.10 Financial and Economic Evaluation

1.10.1 Methodology

The financial and economic evaluation described in this study was performed according to UNIDO Guidelines for Preparation of Industrial Feasibility Studies using COMFAR® software (Computer Model for Feasibility Analyses and Reporting). Unless noted otherwise, all values are expressed in 1990 US dollars and an exchange rate of H \$1.5-to-US \$1.0 is used.

1.10.2 Total Fixed Investment Cost

The following is a summary of the total initial fixed capital investment required for the project using a simple and optimum plant scenario.

Summary of Total Initial Fixed Capital Investment

	Optimum	Plant	Simple Plant	
Item	US \$	н \$	US \$	Н\$
Land (leased at H \$6,000/year)	o	0	0	0
Site preparation and development	0	66,000	0	66,000
Structures and civil engineering	207,000	109,000	152,000	84,000
Incorporated fixed assets	50,000	2,000	15,000	1,000
Plant machinery and equipment ^b	326,800	45,000	250,800	30,000
Preproduction expenditures ^c	166,300	0	139,4()	0
Subtotal	750,100	222,000	557,200	181,000

Total Initial Fixed Investment (US \$)^d 898.150 677,880

1.10.3 Project Financing

The project financial package is not final but is expected to consist of 50% equity provided by the project partners (promoters) with the remaining 50% secured from borrowed funds. While it may be possible to secure some donor equity, this source of equity funds is not considered in the analysis.

a. Made up of engineering, project management, and contractor's fee.

b. Includes mobile equipment.

c. Made up of US \$60,000 feasibility study, contingency, and interest during construction.

d. Based on H \$1.5\$-to-US \$1.0 exchange rate. Values may not add due to rounding.

1.10.4 Total Production Cost

Annual Production Cost (Composite of All Products). The total annual cost of production, in U.S. dollars, for each year of the project beginning in 1992 is summarized below. It is important to note that raw materials account for about 70%-90% of the total factory-gate production cost, depending upon the type of plant and year of project life. Thus, anything that can be done to decrease the landed cost of imported raw materials will significantly benefit the overall economics of the project.

Total Production Cost

	Simple Plant		Optimum Plant		
Year of Project	Raw Materials	Total	Raw Mate	rials	Total
	(thousand US	\$ \$)	(th	ousand U	IS \$)
1 (1992)	598.2 (74 7) ^b	808.8	540.1	(69%)b	778.3
2	936.6 (80%)	1,168.5	845.6	(77%)	1,104.2
3	1,200.2 (83%)	1,447.6	1,083.7	(80%)	1,357.0
4	1,512.8 (85%)	1,779.1	1,366.4	(82%)	1,657.4
5 (1996)	1,628.6 (86%)	1,899.6	1,471.3	(83%)	1,765.8
6	1,762.0 (86%)	2,038.0	1,591.8	(84%)	1,889.9
7	1,903.0 (87%)	2,184.0	1,719.2	(85%)	2,020.6
8	2,041.9 (88%)	2,329.8	1,844.7	(86%)	2,151.1
9	2,174.7 (88%)	2,468.1	1,964.6	(86%)	2,274.4
10 (2001)	2,294.1 (89%)	2,587.8	2,072.5	(87%)	2,380.1
11	2,397.6 (89%)	2,689.2	2,166.0	(88%)	2,468.7
12	2,481.3 (89%)	2,778.2	2,241.6	(88%)	2,549.6
13	2,545.9 (89%)	2,846.7	2,300.0	(88%)	2,611.8
14	2,594.4 (90%)	2,897.8	2,343.8	(88%)	2,658.2
15 (2006)	2,638.7 (90%)	2,944.2	2,383.8	(88%)	2,700.3

a. Includes all imported fertilizer materials, filler, and conditioning agent (clay). Does not include empty bags, fuel, and miscellaneous operating materials and supplies.

Production Cost by Product -- A summary of the production cost for each product in the production program for selected years of the project is shown in Table 1-3. The variation in cost from year to year is due to the cost structure which varies, depending upon the amount of working capital and the loan repayment and depreciation schedule.

b. Values in parentheses indicate percentage of total cost attributed to raw materials.

1.10.5 Financial Evaluation

Net Present Value and Internal Rate of Return--The following is a summary of the net present value and internal rate of return for the two project scenarios evaluated (simple and optimum plant) assuming a 15% discount rate and two levels of product selling prices (to importers and dealers) f.o.b. factory gate.

	Simple Plant	Optimum Plant
Discounted Selling Price		
Net present value at 15% discount rate Internal rate of return Maximum Selling Price (No Discount)	(-) US \$1.59 million (-) 12.2%	(-) US \$1.17 million 2.1%
Net present value at 15% discount rate Internal rate of return	(-) US \$547,000 6.7%	(-) US \$131,000 13.7%

<u>Payback Period</u>--In both project scenarios, the payback period exceeds the assumed project life of 15 years.

<u>Cash-Flow Analysis</u>--A summary of the net cash flow for years 1, 6, and 15 of the project for the two plant scenarios using two levels of product selling prices (to importers and dealers) f.o.b. factory gate.

••	Net Cash Flow		
Year	Simple Plant		
Discounted Selling Price	(thousa	nd US \$)	
Year 1	(-) 276.7	(-) 348.1	
Year 6	(-) 139.5	1.74	
Year 15 (end of project)	(·) 121.7	123.6	
Cumulative discounted cash flow (at 15%) for 15-year project life	(-) 1,588.3	(-) 1,172.1	
Maximum Selling Price (No Discount)			
Year 1	(-) 209.0	() 200 5	
Year 6	62.4	(-) 280.5 203.6	
Year 15 (end of project)	108.7	425.9	
Cumulative discounted cash flow (at 15%) for 15-year project life	(-) 547,4	(·) 131.2	

<u>Sensitivity Analysis</u>--Because the overall project cost structure is so highly dependent upon the cost of imported raw materials, there is little scope for decreasing the factory-gate production cost except by optimizing the landed cost of raw materials.

The foregoing analysis already examined the financial impact of
(1) fixed capital investment and (2) the factory-gate selling price according
to the basic assumptions used for the study

The following data show the selling prices to importers and dealers that would be required in the optimum plant scenario at the exchange rate of H \$1.5-to-US \$1.0 to achieve the desired internal rate of return of 15%.

	Values Used fo		
	Discounted	List f.o.b. Selling	Required ^a
	f.o.b. Selling Pri	ce Price (No Discount)	f.o.b. Selling Price
	(H \$/t)	(H \$/t)
Urea	287	318	322 (35) ^b
Ammonium sulfate	221	244	248 (27)
20-20-10	314	347	352 (38)
12-12-20	287	318	322 (35)
14-14-14	307	340	344 (37)
Internal ra	ate		
of return	1, % 2.1	13.7	15.0

a. This price structure would result in an overall internal rate of return for the project of 15% and an accumulated net present value of zero at the end of 15 years.

1.10.6 National Economic Evaluation

The net economic benefit of the proposed project to the country was not determined. However, it is expected to be quite small since the majority (80%-90%) of the major recurring cost of the project is for imported fertilizer raw materials and the in-country value-added component is relatively small. Implementation of the project is more properly justified according to the advantages listed in the following conclusions.

b. Value in brackets indicates the increase in selling price per tonne over the discounted selling price.

1.11 Conclusions

1.11.1 Advantages of Project

The proposed project embodies a number of advantages, namely:

- 1. The development of a domestic industry that will create gainful employment for an extremely poor and underutilized workforce.
- An improvement in the security of supply and relative price stability for fertilizer products which are essential to the increased growth and productivity of the Haitian agricultural sector.
- 3. The provision of a responsible agroservice company that, in addition to supplying fertilizer products and other essential inputs, will provide an urgently needed package of technical services to help ensure that fertilizers and other inputs are used in a cost-effective way, thus increasing agricultural production and improving the economic status of the Haitian farmers and farm workers who account for about 75% of the nation's population.
- 4. Stimulate increased competition among the existing importers thus helping to improve product availability, price stability, and the level of services provided to dealers and farmers.
- 5. Ensure the availability of a more appropriate line of fertilizer products designed for specific crops and agroclimatic conditions.
- 6. Create a general improvement in the credibility of the fertilizer supply sector, thus helping in the formulation and implementation of technically sound and responsible government agricultural policies.

1.11.2 Disadvantages of Project

Financially, the project is not viable according to the assumptions used for the study and it cannot be recommended as a sound investment.

The justification for, and level of, donor participation in, and government support of, the project should be viewed in terms of the previously mentioned benefits of the project and the government's desire to stimulate long-term increased agricultural productivity and self-sufficiency in food production.

To make the project financially sound the margin between the cost of production and the factory-gate selling price would have to be increased about H\$ 35/t (US \$23/t) over and above the discounted selling prices used in this study. The achievement of such an increase will require the combination of a

number of actions including (1) optimiztion of raw material procurement and transportation methods to decrease the landed cost of raw materials, (2) some type of farmer incentive scheme to encourage fertilizer use despite the elevated cost, (3) donor financing to lessen the impact of borrowed capital on the cost of production, and (4) government policy reforms designed to encourage the development of a domestic, value added fertilizer industry.

1.11.3 Recommendations

The following recommendations are proposed for further evaluation before either abandoning or implementing this project:

- 1. Raw Material Procurement--Because raw materials represent 80% or more of the cost of production, methods for decreasing the landed cost of raw materials should be confirmed. The most likely method is to exploit the possible economics of raw material procurement and transport that could accrue if participation of the potential partner from the Dominican Republic can be confirmed and some type of cooperative agreement for raw material procurement and ocean transport could be arranged.
- Project Financing--Confirm project financing alternatives for fixed investment. Also explore ways to secure favorable financing for short-term working capital.
- 3. <u>Pricing Structure</u>--Confirm product pricing structure and incentives that will be required to establish the majority of the existing Haitian importers as the initial buyers for the project's output.
- 4. <u>Allied Products</u>--Determine the scope, sourcing, pricing, and market share that can be expected for such allied products as pesticides, seeds, and farm tools and implements.
- 5. Other Agricultural Projects--Determine the status and confirm the scheduled completion of other agricultural projects, particularly irrigation, to more precisely predict total fertilizer market demand and market share.
- 6. <u>Supportive Technical Assistance</u>—Determine scope, cost, and sources of technical input and funding for supportive assistance projects that will enhance the objectives of this project as well as those of the total agricultural sector. The most urgently needed assistance projects include (1) dealer training and development, (2) soil and plant tissue testing laboratory to help determine optimum fertilizer recommendations,

(3) short-term credit programs to assist dealers establish warehouse facilities and stock fertilizer products, and (4) an evaluation of agricultural input-output pricing structure to assist the Government of Haiti in formulating effective policies to promote fertilizer use and increase agricultural productivity.

Table 1-1. Major Agricultural Areas, 1986

Agricultural Area	Z of Total	Population Density (persons/km²)	Principal Crops
Arid and semiarid plains	45	77-200	Maíze, millet, peas, beans
Mountainous (dry)	25	39-100	Maize, millet
Mountainous (humid)	15	200	Coffee, vegetables, fruits
Plains (humid)	10	300-400	Rice, maize, bananas, fruits, sugarcane
Plains (irrigated)	5	650	Rice, bananas, vegetables, tobacco
	100		

Source: Hatch Associates Ltd. 1986. Engineering & Financial Analysis, Volume I--The Report, and Volume II--Appendices and Drawings, Toronto, Ontario, Canada.

Table 1-2 Annual Fertilizer Raw Material Requirements for 15-Year Project Life

							Annual F	law Materia	1 Requirem	ents a					
Raw Material	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Urea	2,383	3,656	4,636	5,719	6,020	6,514	7,035	7,549	8,039	8,481	8,853	9,173	9,411	9,590	4
Standard amnonium										252		222	***		
sulfate	50	106	136	172	186	201	217	233	248	262	274	283	290	297	302
Diammonium phosphate (DAP)	317	515	678	907	1.028	1,112	1,201	1,288	1,372	1,447	1.513	1,566	1,607	1,637	1,665
Muriate of potash (MOP)	345	574	760	1,009	1,152	1,246	1,346	1,445	1,538	1,623	1,696	1,755	1,801	1,835	1,867
Filler	229	380	502	673	765	828	894	959	1,022	1,078	1,126	1,166	1,196	1,219	1,240
Conditioning agent															
(bagged)	45	74	98	130	148	160	173	186	198	209	218	226	<u>231</u>	236	240
TOTAL	3,369	5,305	6,810	8,610	9 299	10,061	10,866	11,660	12,417	13,100	13,690	14,169	14,536	14,814	15,068

a. Indicated quantities include allowance for an overall shrinkage (loss) of 3.0%.

b. All materials are granular except ammonium sulfate and conditioning agent (clay).

Table 1-3. Total Production Cost by Product for Selected Years of Project

	Product						
		Ammonium	2704460				
		Sulfate	20-20-10	12-12 <u>-</u> 20	14-14-14		
Year of Project	<u>Urea</u>	<u>(Standard)</u> (US	\$/t bagged prod		14 14 14		
Simple Plant							
Year 1 (1992)3,271 t total production							
Raw materials h	192.9	107.8	199.8	164.0	163.8		
Conversion cost	39.6	39.6	39.€	39.6	39.6		
Depreciation	9.3	9.3	9.3	9.3	9.3		
Financial cost	<u> 15.5</u>	<u> 15.5</u>	15.5	<u>15.5</u>	<u>15 5</u>		
TOTAL	257.3	172.2	264.2	228.4	228.2		
Year 6 (1997)9,768 t total production							
Raw materials h	192.9	107.8	199.8	164.0	163.8		
Conversion cost ^D	21.6	21.6	21.6	21.6	21.6		
Depreciation	3.2	3.2	3.2	3.2	3.2		
Financial cost	3.5	<u>3.5</u>	3.5_	_3.5	3.5		
TOTAL	221.2	136.1	228.1	192.3	192.1		
Year 15 (2006)14,629 t total production							
Raw materials a	192.9	107.8	199.8	164.0	163.8		
Conversion cost	18.6	18.6	18.6	18.6	18.6		
Depreciation	2.2	2.2	2.2	2.2	2.2		
Financial cost	0.1	0.1	0.1	0.1	0.1		
TOTAL	213.8	128.7	220.7	184.9	184.7		
Optimum Plant							
Year 1 (1992)3,271 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8		
Conversion cost	39.6	39.6	39.6	39.6	39.6		
Depreciation	12.7	12.7	12.7	12.7	12.7		
Financial cost	20.6	<u> 20.6</u>	20.6	<u>20.6</u>	20.6		
TOLAL	246.6	161.5	256.0	222.3	222.7		
Year 6 (1997)9,768 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8		
Conversion cost	21.6	21.6	21.6	21.6	21.6		
Depreciation	4.3	4.3	4.3	4.3	4.3		
Financial cost	4.6	4.6	4.6	4.6	4.6		
TOTAL	204.2	119.1	213.6	179.9	180.3		
Year 15 (2006)14,629 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8 18.6		
Conversion cost	18.6	18.6	18.6	18.6 3.0	3.0		
Depreciation	3.0	3.0	3.0	0.1	_0.1		
Financial cost	0.1	01	0.1				
TOTAL	195.4	110.3	204.8	171.1	171.5		

a. Indicated cost includes allowance for an overall shrinkage (loss) of 3.0%.b. Includes all direct and indirect costs of production.

2.0 PROJECT BACKGROUND AND HISTORY

2.1 Project Background

This project deals with the establishment of a fertilizer blending and bagging plant in Haiti. The proposed plant would be owned and operated by a private-sector Haitian company. The objective of the company is to provide a cost-effective package of fertilizer products and related services to the Haitian farmer thereby helping to increase food production and generally increase the productivity of the agricultural sector.

With regard to fertilizer, Haiti currently relies totally upon imported bagged fertilizers that are not further processed in Haiti to increase their value or improve their agronomic effectiveness. Since Haiti has no indigenous fertilizer raw material resources of commercial significance, the proposed project will also depend heavily upon imported raw materials. However, the required materials will be imported in a more economical bulk form and will be bagged locally, thus decreasing the landed cost compared with the current cost of imported bagged fertilizers. Some of the nitrogen, phosphate, and potassium (potash) materials will be mixed (blended) prior to bagging to achieve optimum nutrient ratios and concentrations. This local blending and bagging activity will further increase the use of local resources thus improving the Haitian value-added component of each bag of fertilizer.

In addition to supplying fertilizer products, the project will provide a package of services, particularly technical assistance to dealers and farmers, to ensure that the correct products are used in the most cost-effective way. This technical assistance activity currently is lacking in Haiti and poses a major constraint to increased fertilizer use, improved crop production, and an enhanced quality of life for the resource-poor Haitian farmers and farm workers who currently account for about 75% of the population.

The proposed project design takes into consideration a number of practical local factors including:

- 1. An extremely resource-poor population.
- A high level of instability at all levels of government.
- 3. Severe constraints on the availability of foreign exchange.

- 4. A relatively small and unstable market for fertilizer.
- 5. A severe shortage of technical assistance relative to fertilizer use and crop production.
- 6. The potential for strong competition from established importers currently supplying the Haitian fertilizer market.

In view of these and other technical, commercial, and less tangible factors, the envisioned project incorporates the following stabilizing factors to minimize risk and thereby help to ensure success.

- 1. Low initial fixed capital investment with a plan for staged expansion to accommodate increased business activity should it occur.
- 2. High equity-to-debt ratio.
- Flexibility with regard to mode of operation, product type, and services offered.
- 4. Maximum utilization of local management and labor and other domestic resources.
- 5. Heavy emphasis on market intelligence and market research designed to identify and meet dealer/farmer needs and ensure competitiveness.

Additionally, the project will seek to strengthen its position in the market and increase its visibility and revenues by promoting the servicing of fertilizer imports supplied by donors which currently amount to about 2,500 tpy. Also, as a basic supplier of fertilizer products and services, the project is well positioned to increase its business activity by marketing allied products such as seeds, pesticides, and farm tools and implements.

2.2 Project Promoter/Initiator

The proposed project is being promoted by a Haitian entrepreneur. 5 While the equity participation in the company is not clear at this time, it is quite likely that, in addition to the promoter, private-sector principals of the Dominican Republic fertilizer industry (a major current supplier of imported fertilizers to Haiti) and a group of Haitian investors will be involved. Borrowed funds are likely to be obtained from Societé Financière Haïtienne de Développement S.A. (SOFIHDES) and offshore funding sources.

^{5.} Mr. Jean-Michel Cherubin, P.O. Box 13372, Delmas, Port-Au-Prince, Haiti.

In addition to financial equity, the equity partners are expected to bring to the proposed company (1) managerial and fertilizer marketing skills; (2) technical skills relative to procurement of fertilizer materials, blending plant operation, transport and logistics; and (3) business acumen pertinent to the region.

Additionally, because the principal promoter has obtained funding from UNIDO/UNDP for performing this preproject study, many of the significant technical, market, and financial parameters are defined and described well in advance of implementation to facilitate sound planning thus minimizing the risks that may be encountered should the project be implemented.

2.3 Project History

2.3.1 <u>Historical Development</u>

This proposed project is in part an outgrowth of an earlier initiative taken by a Canadian entrepreneur who established a fertilizer blending plant in Haiti in 1981. The blending plant was operated under the corporate name of Agricultural Services S.A. (ASSA). The company flourished for a few years and then, due to a number of internal and external problems ceased operation in May 1987.

The promoter of this current project was one of ASSA's major fertilizer dealers for a period of time (about 3 years) and thus is aware of the potential benefits that fertilizers could offer to the Haitian farmer, provided they could be supplied in the correct nutrient mix at a competitive price along with a package of technical services that would ensure their cost-effective use thus leading to farmer acceptance and farmer loyalty.

With the financial assistance of UNIDO/UNDP, a study to evaluate the feasibility of establishing a new fertilizer-blending and bagging plant in Haiti was solicited by UNIDO/UNDP in February 1990 on behalf of the current promoter. The International Fertilizer Development Center (IFDC) with

^{6.} International Fertilizer Development Center (IFDC). 1990. "Supplying Quality Multinutrient Fertilizers in the Latin American and Caribbean Region-Emphasizing Bulk Blending and the Complementary Role of Granulation," IN NPK Workshop Proceedings, Special Publication IFDC-SP-14, IFDC, P.O. Box 2040, Muscle Shoals, Alabama, 35660.

Headquarters in Muscle Shoals, Alabama, U.S.A., was selected to perform the study. TFDC began field evaluation/data collection work in Haiti June 4, 1990.

2.3.2 Other Studies and Investigations

In 1985 ASSA was contemplating relocation and expansion of their blending plant. This relocation and expansion plan was designed to decrease the cost of production and delivery of fertilizer to the major farming areas and to better facilitate the servicing of a growing market for ASSA fertilizer products. A study, funded by the Canadian International Development Agency, was performed by a Canadian firm--Hatch Associates Limited (Hatch) of Toronto. Hatch subcontracted a portion of the fertilizer plant process design study work to IFDC. IFDC also provided market-related consulting services to Hatch. The study was completed in January 1986 about the time when ASSA was undergoing a severe financial crisis and the Duvalier Government collapsed. Since that time no action has been taken on implementation of the ASSA plant relocation and expansion project, and ASSA closed its business in mid-1987.

The actual commercial experience of ASSA as well as the Hatch Study showed that a significant potential market for fertilizer exists in Haiti. However, in view of the severe technical, financial, and political onstraints of the country, the development of this market will require a unique mix of practical, technical, commercial, and financial skills in addition to supportive government policies. The required skills and other unique features of the proposed project are more fully elaborated in this study.

^{7.} UNIDO Contract No. 90/028/GYL; Project No. DP/HAI/89/033; accepted by IFDC May 31, 1990, IFDC Contract No. 00926/90.

^{8.} Hatch Associates Ltd. 1986. Engineering & Financial Analysis, Volume I--The Report, Volume II--Appendices and Drawings, Toronto, Ontario, Canada.

2.4 Feasibility Study

2.4.1 Author

This study was prepared by an IFDC team consisting of the following specialists:

James J. Schultz (Team Leader) -- Fertilizer Plant Engineering and Production/Supply Specialist

Catalino C. Yaptenco, Jr. -- Market Development Specialist

Gene T. Harris--Agricultural Economist

Jorge R. Polo--Industrial Investment/Financial Analyst

C. John Currelly--Market/Commercial Analyst (short-term consultant to IFDC with residence in Haiti)

2.4.2 Study Title: Fertilizer Plant Feasibility Study--Haiti

Although this study is referred to as a feasibility study and the UNIDO Guidelines for performing such a study are followed to the extent possible, additional study and evaluations will be required to achieve a more complete input, especially with regard to the following aspects:

- Selection of the plant site is only preliminary and the detailed civil engineering works and costs related to the selected site, or an alternative site, must be more fully developed.
- Project financing and equity makeup criteria have been assumed based on a very preliminary analysis of the project's needs and potential.
- A more complete evaluation of the national economic value of the project is needed to help obtain favorable government policy support for the project.

Although this study lacks complete elaboration of the above components, a maximum effort, within the scope of the available contract funds (budget), was made to determine the most urgent and critical parameters of the project including:

- 1. Characterizing and quantifying the market for the project's fertilizer products (type, price, and quantity).
- 2. Determination of the possible impact of competition.
- 3. Estimation of the minimum level of investment that could be made consistent with the local market situation.
- 4. Development of a first-year business/marketing plan.

5. Identification of the constraints and recommendations for additional assistance projects that will be needed to allow the project to develop and grow while serving the Haitian farmer with cost-effective fertilizer products and services.

2.4.3 Ordering Party

United Nations Industrial Development Organization (UNIDO) contracts section (M. Kohonen, Acting Chief), Vienna, Austria, May 31, 1990.

3.0 MARKET AND PLANT CAPACITY

3.1 Demand and Market Study

3.1.1 Determination of Fertilizer Consumption and Market, 1985-89

Because of the long-term disturbed economic and political situation in Haiti, little reliable data, relative to the agricultural sector and particularly fertilizer use, are available.

In the absence of reliable secondary data, primary data were collected and analyzed to determine the fertilizer market. The data were generated by examination of records and/or documents available at entry points of supply into the country, either by land or ocean transport. Cross checks were done with the major sources of supply, such as the Dominican Republic. Consumption data by agricultural area, together with market shares and pricing structure of the various importers, were evaluated by in-country trips and interviews with importers, dealers, small and plantation farmers, private and government technicians, and operating personnel.

3.1.2 Data and Alternative Projection Methods

Resource Base--By most economic norms Haiti is one of the poorest countries in the world; its people are the poorest in Latin America. The contrast in wealth between classes is stark. The wealthiest 1% of Haitians account for 44% of national income but pay only 3.5% in taxes. The total population is about 6.5 million with most people living in the rural areas. About 75% earn the equivalent of only one-sixth of the US \$352 national average per capita income and this continues to decline. Out of a work force of 2.4 million, 80% are unemployed or not working in paying jobs. Women dominate the transport and marketing of farm produce. Less than 10% of the population has access to running water.

About two-thirds of the country is comprised of rough, mountainous terrain, unsuitable for cultivation. Out of the total land area of 27,750 km², only about 40% or 1.1 million ha is arable. The climate is tropical, but generally semiarid. This is due to the mountains dividing Haiti from the Dominican Republic which cut off moist trade winds. Agriculture, which is the main economic sector, has steadily declined as a result of severe deforestation, soil erosion, low soil fertility, primitive crop production

methods, and the lack of a defined national agricultural policy. Crop production in rice, maize, and sugarcane is inadequate to keep up with domestic demand. The problems in food production are complex and require a serious and sustained commitment by the Government together with appropriate outside assistance. One positive step to improve agricultural production is the establishment and operation of a local fertilizer industry, the subject of this study.

<u>Land Use</u>--The major agricultural areas and the corresponding principal crops are shown in Table 3-1.

The location of the plains, plateaus, and mountains is shown in Figure 3-1.

Rainfall --Rainfall is bimodal in most parts of the country with maximum precipitation in April and May and October and November. Most of the country receives 1,000 mm of rainfall; substantial parts of the country receive over 1,500 mm and the higher elevations in the southern peninsula and the northern and central plateau receive 1,800-2,000 mm. Monthly precipitation data for the 1984-87 period are given in Table 3-2. At least 1,500 mm of rainfall is required to sustain a normal crop growth in the Haitian tropical environment.

Of the two dry seasons, December through February is usually the most severe, with March, June, and July being moderately dry. Widespread deforestation has caused very serious soil erosion in many areas. Most soils are thin and exhibit poor water absorption and retention properties.

Agriculture—About 1.1 million ha is utilized for the cultivation of various crops. In 1988, 74% of the working population was engaged in agriculture, forestry, and farming but they provided only 32% of the country's gross national product. The production of agricultural commodities provided a livelihood for 70% of the population in 1989. One-third of the peasants have no land, while the remainder owns only about 1% of the land. Exclusive of the large farms, there are about 616,700 small-scale farms of which 95% are well below 1-ha size; about 5% of the farms have a maximum size of 1.25 ha. About 60% (about 0.7 million ha) of the arable area is cultivated in rice, plantain, maize, sorghum, potatoes, cassava, taro, and yams, which are the principal food crops of the country. Data pertaining to the principal crops are shown in Table 3-3.

The planting season for the major crops is spread quite evenly throughout the year as shown in Table 3-4.

Accurate data on the irrigated area are not available. The major irrigated area is the Artibonite Valley. In the agricultural sector assessment report of Haiti by USAID, 9 the estimated total irrigated area in 1984 was 73,720 ha. There has been no assessment since then, and it is evident that the total irrigated area has declined considerably during the past 6 years because of poor maintenance of the irrigation systems, deterioration of the irrigated land structure, and a reduction of the water source as the result of deforestation and silting of the irrigation canals by severe soil erosion. Observation of the irrigated areas shows that efficiency of water use in the systems is below 70%. Since rice farming is practically all done by hand, the distribution and control of water in the "irrigated areas" is very inefficient.

As shown in Figure 3-2, fertilizer consumption in Haiti decreased from 16,030 t product in 1985 to 12,883 t product in 1989, or 20% in a period of 5 years.

The major factors which caused the decrease in consumption can be attributed to:

- 1. Low farm-gate prices for farm produce, particularly rice, where 65% of the fertilizer is consumed.
- 2. Delays in importation of fertilizer thus limiting the supply in the marketplace.
- 3. Severe reduction of credit in the marketplace; most transactions are performed on a cash basis.
- 4. Political instability of the country. Since the revolution in February 1986, the country has operated under a provisional government with very unstable political conditions.
- 5. Lack of post-harvest marketing and distribution facilities.
- 6. Very poor crop production practices.

The fertilizer market of Haiti from 1985 to 1989, by product and nutrient, is shown in Table 3-5.

Out of the 12,883 t of fertilizer products used in 1989, 92% or 11,852 t was consumed in the food crop sector, and the balance (8% or 1,031 t) was consumed in the industrial crop sector. About 55% was used during the first half of the year and 45% in the second half of the year.

^{9.} Agricultural Sector Assessment, Haiti, USAID, 1987.

In 1989 nitrogen fertilizer, principally urea, accounted for 65% of the market, 12-12-20 for 25%, and the remaining 15% was shared by a number of complex grades having an average (composite) analysis of 14-14-20. Fertilizer usage during the same period showed that rice and onions in Artibonite, and potatoes, onions, and cabbage in Kenscoff consumed 65% and 12%, respectively. Maize and sorghum are not usually fertilized, except when planted in large plantations where fertilizer is used. Fertilizer application on sugarcane and coffee has been reduced drastically and often not practiced because of the low export price received for sugar and the disease infestation in coffee. With the domestic demand for sugar, however, it is expected that the area of fertilizer application on sugarcane will increase.

The 1989 fertilizer consumption areas shown in Figure 3-3 are based on the following data:

Consumption Area	Стор	% of Total	Fertilizer Consumption (t product)
∴ctibonite Valley	Rice/onions	65	8,373
Leocane	Corn/industrial tomatoes	2	258
Kenscoff	Vegetables (all kinds)	12	1,546
Foret des Pins	Vegetables (potatoes/ onions/cabbage)	7	902
Cul de Sac	Tobacco/industrial tomatoes/vegetables	6	773
Les Cayes	Sugarcane/rice/maize/ tobacco	5	645
Cap Haitien/others	Sugarcane/citrus/coffee vegetables/onions	3	386
TOTAL		100	12,883

Except for the plantation crops or crops cultivated for industrial markets, crop farming in Haiti is generally primitive, being done by hand using hand implements. Harvesting and processing of crop produce is also completely manual. In irrigated rice, for example, where 65% of the fertilizer is consumed, land preparation, distribution and control of irrigation water, fertilizer use, and other agronomic practices are below acceptable levels. It is estimated that nearly half of the nutrient value of urea fertilizer applied on irrigated rice is lost due to improper timing and

application methods. This could be the reason why farmers apply a 196-12-20 kg nutrients (400 kg of urea plus 100 kg of 12-12-20) when the recommended rate of application is 100-60-60 kg nutrients (N + P2O5 + K2O) per hectare as shown in Table 3-6. The data supplied by farmers and used to determine the economics of yield showed that the value/cost ratios for paddy rice, maize, and tobacco are 3.9, 2.6, and 2.6, respectively.

Except for tobacco and industrial tomatoes (plantation farming), the use of pesticides is far below recommended levels; they are mostly used on rice seed beds, vegetables, and some on sugarcane. The fields are usually weedy and cultivation is not normally practiced after transplanting or planting.

3.1.3 Market Data and Final Results

The market data obtained covered a period of 5 years, 1985-89, show that fertilizer consumption in Haiti has declined during the period for the reasons already discussed. A combination of forecasting methods was used for projection of fertilizer demand taking into consideration the limited amount of reliable data available. The impact of the factors responsible for the reduction of fertilizer use was determined and quantified, while projecting the possible positive realistic changes in these factors and their effects on the market segments. These elements, together with the availability of a local supply of fertilizers and the proposed project's marketing programs, are expected to slowly reverse the declining trend in fertilizer use.

The decline in fertilizer use leveled off in 1988 and 1989. Use data for the first half of 1990 show more or less the same level as the first half of 1989. This indicates that fertilizer consumption in the country may continue at the same level through 1991 unless significant changes occur in the factors affecting the fertilizer market. The return to political stability in the country can only begin after the election tentatively scheduled in December 1990 or early 1991. The year 1991 will serve as the transition year for the new government. An increase in stability can be expected to have some positive impact in 1992. Based on this rationale, the fertilizer market in 1991 is assumed to be the same as 1989 and is used as the fertilizer market base year for this study.

Based on the experience of other developing countries with problems in fertilizer consumption similar to Haiti, a 5% annual increase in the commercial fertilizer market during each of the next 3 years and 7% during the

fourth and 8% during the fifth year are considered realistic projections. It is assumed that the Japanese fertilizer donation of 2,500 tpy will be maintained for the next 5 years.

Less developed countries, whose consumption bases are very small, are certainly capable of increasing growth in fertilizer consumption at a much higher rate than has been projected. However, because of the volatile political situation in Haiti and the absence of a defined agricultural policy, it is assumed that a high growth rate will not occur. Growth in the fertilizer market will most likely be much more erratic than the smooth growth projected, but the growth rates projected are thought to be realistic at this time.

The assumptions factored into the market forecast for the first 5 years of commercial operation of the project (1992-96) are listed. These assumptions evolved from discussions with, and information gathered from, those directly or indirectly involved and concerned with the fertilizer and agricultural sectors of Haiti.

- Political stability in the country will only start to improve if the scheduled elections in November 1990 can be conducted successfully and the elected government takes control. The year 1991 will be a transition period for improving the overall business climate of the country.
- 2. Fertilizer production from the proposed fertilizer plant will definitely increase fertilizer consumption.
- 3. The improved farm-gate price for rice will remain the same as in 1990 and will sustain the incentive for rice farmers to use fertilizers.
- 4. The domestic market for sugar and the export market for Chinese vegetables will offer a strong incentive to implement planned projects that will increase fertilizer use. 10
- 5. The newly elected government will place a priority on the rehabilitation of the country's agriculture where the majority of its population is dependent. The objectives will be to achieve self-sufficiency in rice, maize, and sugar and to reduce and ultimately eliminate food imports.

^{10.} Vegetables for the U.S. oriental market such as bitter melon, hot pepper, and Thai eggplant.

The various agroforestry programs to improve the watershed will also be a government priority and such restoration programs will require fertilizer.

- 6. The Japanese donation of 2,500 tpy will continue at this same approximate level for at least 5 years.
- The total commercial fertilizer market is projected to increase by 5%.

1993

- The program of the new government for rehabilitation of agriculture will continue to receive priority, particularly for much needed improvements in irrigation systems. This should allow two crops annually on 73,/20 ha of irrigated area.
- 2. Parallel with rehabilitation of the irrigation system, there will be a priority rice production program to attain self-sufficiency in the country's staple food. The program will not only increase fertilizer consumption but will adjust the nutrient imbalance from the existing rate of 196-12-20 kg nutrients (N-P2O5-K2O) per hectare to the recommended 100-60-60 kg nutrient dose.
- 3. The change in the nutrient ratios for paddy rice and the supply of custom-blended NPK compounds for the industrial crop market will change the product mix ratio, with more growth in blended NPK compounds than in straight nitrogen fertilizers.
- Continued expansion in the fertilized sugarcane area to meet the domestic demand for sugar.
- A sustained market increase in the commercial sector of 5% is projected for 1993.

- This year will be the turning point for the agricultural economic recovery program. Improved political stability of the country will provide a more positive climate for private investments and for continuation of foreign aid support for the infrastructure projects needed to sustain recovery.
- Rehabilitation of the irrigation systems will be complete. The
 irrigation system improvements will maximize two croppings of rice per
 year and will increase fertilizer consumption.

- 3. The pending plan for a 15,000-ha irrigation project, funded by the Banque Interaméricaine de Dévelopment (BID), will be implemented to help support the new government's food production program.
- 4. The marketing activities of the new fertilizer plant project over the past 3 years will serve as a catalyst in increasing the fertilizer market. The competition is expected to create additional activity to maintain or increase their share of the market.
- 5. The total commercial market increase in 1994 will be similar to 1993 at 5%.

1995

- 1. The country will be working toward attaining self-sufficiency in rice and sugar for its domestic needs.
- 2. The expansion of compound (NPK) fertilizer use in industrial crops (sugarcane, tobacco, and industrial tomatoes) will further change the ratio of straight nitrogen fertilizers-to-NPK blends from 65:35 to 58:42.
- 3. A maize production program will be needed to meet the requirements for poultry and hog feed and reduce or eliminate maize imports. An attractive contract price from feed millers, and government support for production credit, will encourage plantation farmers to produce hybrid maize.
- 4. Commercial vegetable production for export will expand because of the availability of low-cost labor and Haiti's proximity to the United States market. Increased fertilizer consumption per hectare of land will occur.
- 5. Part of the 15,000-ha new BID-funded irrigation system will be operational.
- 6. An increase of 7% in the commercial market is expected for 1995.

- 1. The fertilizer market will continue to grow steadily as a result of the various programs designed to improve the agricultural sector. An even higher growth rate will occur in 1996 if most of the 15,000-ha new irrigation system becomes operational.
- Improvements in the fertilizer marketing system of the proposed fertilizer plant project will continue to contribute to the market growth.

- 3. The ratio of fertilizer consumption between straight nitrogen fertilizer and compound NPK blends will remain at about 58:42.
- 4. The continuity of the food production programs, expansion of irrigation facilities, and increased areas for plantation crops will bring about a fertilizer market recovery to the 1985 consumption level of about 16,000 t.
- 5. A commercial market growth of 8% is projected for 1996.

The total fertilizer market is forecast to increase by 27% from 12,883 t in 1989 to 16,390 t in 1996. This fertilizer market recovery will bring fertilizer consumption to the 1985 level of about 16,000 t product as shown in Figure 3-4.

The fertilizer market forecasts for the period 1992-96 by product and nutrient and by consumption areas are shown in Tables 3-7 and 3-8, respectively.

The ratio of food crop to industrial crop shares in the market forecast will change from 92:8 in 1991, the base year for this study, to about 85:15 in 1996. This change will be due mainly to expansion of sugarcane area in order to achieve self-sufficiency and eliminate the import of sugar. The expansion in fertilized areas for commercially grown tobacco will also increase fertilizer demand for industrial crops.

A summary of the total market forecast for all fertilizer products by consumer crop segment follows:

	Fertilizer Use											
	1991	(Base)		1992	1	.993	19	94	19	95	199	6
Crop Segment	<u> </u>	t	<u>z</u>	t_		<u> </u>		t		t		t
Food crops	92	11,852	90	12,062	87	12,134	85	12,342	85	13,057	85	13,932
Industrial crops	8_	1,031	_10_	1,340	_13	1,813	15	2,178	15	2,304	_15_	2,458
TOTAL	100	12,883	160	13,402	100	13,947	100	14,520	100	15,361	100	16,390

The quarterly fertilizer use pattern for the next 5 years will continue to be dictated by rice and vegetable production. Consumption by quarter will remain at 25%, 30%, 23%, and 22%, respectively.

3.2 Sales Forecasts and Marketing of Products

3.2.1 <u>Data and Alternatives</u>

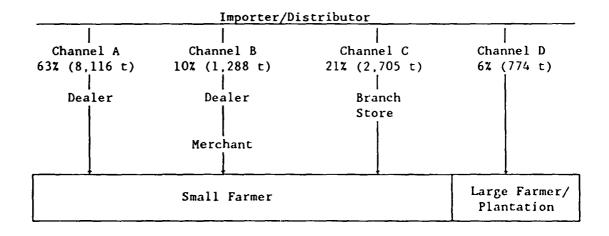
An evaluation of Haiti's existing fertilizer market was conducted (Section 3.1.3) to establish a benchmark for formulating the sales forecast and marketing plan for 1992-96.

- 1. <u>Demand Forecasting</u>.-There is no agency, private or public, forecasting the fertilizer market demand for Haiti. For that matter, there are no public data available on past fertilizer consumption. The market data assembled as a result of this study are needed not only to identify and evaluate the market size and its profile and the factors linking demand to actual consumption, but more importantly to establish a basis for forecasting future requirements. Realistic forecasts of demand are essential as they provide the basis for all planning, including national fertilizer sector policy, as well as procurement and marketing.
- 2. Fertilizer Supply--All commercial fertilizer products are currently imported. The complex NPK grades and part of the urea fertilizers are sourced from the Dominican Republic by truck or sea while the balance of the urea is sourced from Trinidad, Venezuela, and Guyana (Dutch origin) requiring longer delivery leadtime which sometimes results in unscheduled delays in transit. Among the complex NPK grades, 12-12-20 is preferred, supplying 30% of consumption. Granular urea from Trinidad is preferred over the prilled material obtained from Venezuela and Guyana. Japanese fertilizer donation normally consists of nitrogen fertilizer (urea and ammonium sulfate) and complex NPK grades having a 60:40 straight N-to-NPK ratio. The bag sizes used in the Haitian market are 50 kg or 100 lb (45.4 kg). The bags are constructed of woven polypropylene with polyethylene liners. Bags with import markings (brand identification) are preferred and, according to the experience of dealers, command better prices. Only Agri-Supply Co., a local fertilizer company, is starting to use their own brand on imported urea fertilizer bags. The preference for imported brands could be due to the classical colonial mentality that assumes imported products are better than domestic products.

Tendering and procurement from Trinidad, Guyana, and Venezuela are by irrevocable United States bank-confirmed letters of credit (this incurs an additional expense of 1.5% of the f.o.b. price for United States banker's acceptance) or United States bank draft. Importation from the Dominican Republic is normally paid in cash in U.S. dollars.

- Marketing Channels -- There are four existing marketing channels for handling imported fertilizers in Haiti as follows:
 - Channel A--Fertilizer is channeled from supplier, to importer, to dealer, to small farmer.
 - Channel B--Fertilizer is channeled from supplier, to importer, to dealer, to merchant, to small farmer.
 - Channel C--Fertilizer is channeled from supplier, to importer, to the importer's branch store, to small farmer.
 - Channel D--Fertilizer is channeled from supplier, to importers who are direct users (large farmers and plantations).

These channels and their corresponding share of market in 1990 are shown below:



The margins customarily made by the importers, dealers, and merchants are indicated in Table 3-9.

The dealers are independent traders whose business activities include consumer goods, cement, farm supplies, and some pesticides. The service provided to farmers is usually in the form of price discounts, and in a few cases, a very limited amount of credit.

It is important to note that in Channel D (importer/plantation) one account, Haitian American Sugar Company, a very small consumer in 1989, is starting to increase consumption in 1990 and 1991 because of expansion of area to be fertilized.

4. Physical Distribution--As mentioned earlier, the modes of transport for imports are either by truck or by small ocean-going ships, while all distribution in-country is by truck. Trucks with a capacity of 20 t-36 t and ships with a capacity of 500 t-2,000 t are readily available for imports. For in-country transport, 5-t to 10-t capacity trucks are readily available.

The cost of transporting fertilizer by truck from suppliers in the Dominican Republic to major points follows:

DR--Port-au-Prince US \$27.5/t (450 km)
DR--St. Marc US \$33.0/t (550 km)
DR--Les Cayes US \$41.3/t (650 km)

Warehouses varying in capacity are normally available in the fertilizer market centers except in Kenscoff and Foret des Pins where storage space is scarce.

- 5. Fertilizer Prices--Fertilizer retail prices at the dealer will vary from one market place to another depending on the distance from source of supply, amount of handling required, and the level of competition.

 Granular urea has the same retail price per bag as the 12-12-20 NPK grade, while the price of prilled urea is H \$1.00/bag less. The fertilizer retail price buildup by market centers as of June 1990 is shown in Table 3-9.
- 6. Prices of Farm Produce--The farm-gate price of paddy rice is affected by the supply of illegally imported rice sold at low prices. During the first half of 1990, stricter impositions and collection of taxes on imported rice slightly improved the farm-gate prices of rice thus encouraging farmers to increase their rates of fertilizer application.

Domestic prices for maize and sugar are relatively attractive for crop production. These crops, however, are dependent on limited rainfall. The lack of irrigation water and poor agronomic practices limit the production of these crops.

7. <u>Competition</u>—Fertilizer competition in Haiti exists in three forms:
(a) the fertilizer companies from the Dominican Republic that export to Haiti and monopolize the commercial complex NPK blend market and supply

part of the urea market, (b) the Haitian fertilizer companies that import all their complex NPK grades and part of their urea fertilizer needs from the Dominican Republic, representing 54% of Haiti's yearly fertilizer requirement, and (c) direct imports (by large farmers and plantations) of urea fertilizer from Trinidad, Venezuela, and Guyana, which represents 15% of the total market requirement. The local companies also participate in the sale of the annual Japanese fertilizer donation to Haiti. This donor tonnage currently represents 31% of supply requirement. The distribution of the fertilizer supply sources in 1989 is shown below:

	<u>Fertilize</u>	r Supply
Supply Source (1989)	% Share	Volume (t)
Dominican Republic Trinidad/Venezuela/Guyana Japan (donation)	54 15 <u>31</u>	6,957 1,826 4,100
TOTAL	100	12,883

The competition from the Dominican Republic is made up of two fairly large fertilizer companies: Fertilizantes Quimicos Dominicanos, S.A. (FERQUIDO) and Fertilizantes Santo Domingo, C.A. (FERSAN) who produce fertilizer blends from imported raw materials. Their combined domestic and export market is about 450,000 tpy. These two companies share more or less equally in the Haiti export market, which totaled 6,957 t in 1989. These imports accounted for 54% of the Haiti market for that year. Each company is represented in Haiti by an agent/importer, who is part of Haiti's fertilizer marketing channel discussed earlier.

The commitment of FERQUIDO management to Mr. Jean-Michel Cherubin (promoter of this project) to invest in the proposed Haitian fertilizer company has been confirmed by Mr. Marcial M. Najri, Assistant to the President of FERQUIDO. A discussion with Mr. Najri during the in-country study confirmed (a) his commitment to invest in the project as a private person, (b) his strong business relationship with Mr. Cherubin, and (c) his confidence in the future of the proposed project. On behalf of FERQUIDO, he offered assistance in the implementation of the project.

With FERQUIDO an an investor, foreign competition will then be coming mainly from FERSAN.

On the local scene, competition will come from two companies—Agri-Supply Co. and Agrotechnique S.A. These are the major companies in the market with 30% and 16% market share in 1989, respectively. The other importers are small, importing for their own use and perhaps selling a small amount, and large fertilizer users (plantation or industrial crops). Agri-Supply Co. sells its volume through nonexclusive independent dealers who are free to obtain their supply from any sources. Agrotechnique S.A., on the other hand, utilizes its own branch stores/warehouses as sales outlets, and most likely incurs a higher field sales overhead than Agri-Supply Co. Their sales outlets are nicely painted and have attractive "Agroservice" signs. It was observed, however, that despite the signboards, the sales outlets did not supply any credible agronomic services to their customers. It was obvious that the "Agroservice" name was for appearance only.

These two companies were interviewed not only to determine their capabilities but also to obtain their reaction to the existence of a local blending plant. Agri-Supply Co. management was very explicit in its response. They do not intend to purchase their fertilizer supply locally; they will compete in the market by importing their fertilizers. Agri-Supply Company's major strength is its nonagricultural product exports which generate U.S. dollars to sustain their need for foreign currency required for importing fertilizer. Their weakness is their poor relationship with their dealers and they are slowly losing their network. Agrotechnique S.A., on the other hand, is open and will buy its fertilizer supply locally if the prices are less than imports and the products are acceptable. Agrotechnique S.A. will always team up with suppliers that can give them an advantage to compete with Agri-Supply Co. to improve their market share. Agrotechnique S.A. has not yet decided whether to support the proposed project and prefers to leave the door open. As for the other importers, the increasing complexity of ordering from abroad, including the difficulty of obtaining acceptable foreign instruments for payment, mitigates against their staying in the importing business. A number of these small importers indicated interest in joining and investing in the company, depending upon the profitability of the project. In general, the interest of local competition in joining

and investing is an opportunity to decrease the problems that the new project will have in penetrating the market. This situation will have to be considered in the company's marketing strategies.

A summary of the market share by company/importer in 1989 follows:

Company/Importer	Product <u>Volume</u> (t)	Market Share (%)
Japan donation	4,100	32
Agri-Supply Co.	3,871	30
Agrotechnique S.A.	2,072	16
Solange Michel	472	4
Andre Pierre	435	3
Famosa	327	3
Hasco	218	2
Darbouco	36	nil
Others	1,352	_10_
	12,883	100

The trend among company/importers is to increase their sourcing of urea and ammonium sulface from suppliers in Trinidad, Venezuela, and Guyana, with granular urea being preferred over prilled urea. The information obtained from the Japanese Embassy in Haiti indicates that the fertilizer donation in 1990 will be 2,500 t of product and will be maintained yearly thereafter at that level.

8. Japanese Fertilizer Donation--This is a yearly Japanese grant of fertilizer, pesticides, and farm equipment worth the equivalent of 250 million yen. This donation started in 1983. Fertilizer is the major portion of the donation consisting of 1,000 t of urea, 500 t of ammonium sulfate, 500 t of 12-12-20, and 500 t of 16-10-20 or 20-20-10. As a condition to the donation, the Government of Haiti has to recover 60% of the f.o.b. cost and generate funds for projects to improve agriculture. As this donor fertilizer is sold at lower prices, it not only disrupts the free market prices but also creates anomalous transactions. It is common knowledge that funds generated from the fertilizer donations have been "diverted to other projects."

- 9. <u>Credit</u>--Credit availability at the farm level is very limited. Most of the transactions are on a cash basis. Importers and dealers extending credit are very selective; usually not exceeding 10%-15% in credit sales at 2.5% interest per month (30% annual rate). It is of interest to note that the use of postdated checks (normally good checks, because of stiff penalty enforcement for bad checks) to secure credit sales is not maximized. This transaction document could be more fully used to secure credit sales to dealers.
- 10. Technical and Extension Services for Market Development -- Farmers normally seek technical advice from dealers who are not usually capable of giving reliable agronomic information. Government agronomists responsible for extending technical services to farmers are usually either not in the field to do their jobs or are not equipped with skills and facilities to adequately perform their jobs. The few agronomists, who are relatively capable and dedicated, do provide farmers with sound advice on the agronomics of crop production. However, there are no farm demonstrations of fertilizer for educating farmers. Product demonstrations, if any, are mostly on pesticides.

The need for a reliable farm extension service in the farming community is acute. This is a priority area which should be given attention as an important part of Haiti's agricultural food production program. Technical service programs on soil testing to determine fertilizer recommendations, farm demonstrations and field days, farmers' meetings to ask questions and seek advice, and dealer training on agronomic services are the most urgent programs needed.

11. Government Policies—The country has had no stated agricultural policy for the past 4 years because the existing governments were provisional while waiting for a new government to be elected. Because of this instability most bilateral foreign aid projects have been suspended. This includes the agricultural projects funded by BID for the new 15,000-ha irrigation system.

There are no policies to regulate, restrict, or monitor the fertilizer business. Fertilizer business permits or licenses are required but are open to everybody who wants to operate a fertilizer business. On the other hand, the fertilizer importers have no defined role in the country's agricultural programs. Except for a "consular fee"

of 3% of the f.o.b. cost, no duties or sales taxes are imposed on fertilizer transactions.

12. Other Allied Businesses—Other allied business opportunities that can be developed in the country include complementary products for the farm such as pesticides, seeds, sprayers, farm tools, and implements. The pesticide market in 1989 is estimated to have a gross sales value of US \$375,000. The pesticide market by product and sales participation of importing companies is presented in Tables 3-10 and 3-11, respectively. The pesticide market by major crop is shown in Table 3-12. Pesticides represent the largest allied product line in the agricultural market.

The seed business, the bulk of which is onion seed, is the second biggest allied product with a high potential for expansion. The existing market is estimated at US \$200,000/year. A government food production program supported with farm credit could drastically increase the pesticide and seed markets. Dealers in the pesticide and seed business are few, and they are not performing any sales promotion. Farm supplies together with other farm tools and implements, if given the right sales and promotion effort, should genera'e substantial complementary business. Since harvesting and processing of crops are all done by hand, the availability of simple mechanical rice threshers could provide an important service to help improve the efficiency of processing the harvest for the market. This form of service could improve the collection of crop production loans at harvest time that may be extended to farmers by dealers.

3.2.2 Marketing Plan and Program for Proposed Project

In the foregoing discussion, inadequacies causing problems and constraints in the fertilizer market and marketing system were examined and identified. To bring about the necessary changes in the farmer's practices and to increase fertilizer use and food production, the following critical components need to be developed: (1) timely availability of fertilizer supplies, (2) effective marketing channels and physical distribution systems, (3) increased level of technical extension services, (4) equitable fertilizer and crop prices, and (5) appropriate credit facilities. The status of these critical components must be integrated into a marketing plan.

Period of Marketing Plan--Although a project life of 15 years is assumed for the financial analysis, the life of the initial marketing plan is 5 years. Considering the volatile political situation and the lack of a defined agricultural policy in the country, a marketing plan that goes beyond 5 years is too uncertain.

The plan (1) summarizes the problems and opportunities,

- (2) postulates the assumptions under which the plan will effectively operate,
- (3) defines the sales and program objectives to be accomplished, (4) specifies the strategies that will guide its implementation, (5) defines the key action steps that must be performed, and (6) states the policies and procedures to be followed by the organization in implementing the plan.

<u>Summary of Problems and Opportunities</u>--A summary of the problems and opportunities of the proposed marketing plan follows:

Problem

Opportunity

Fertilizer consumption decreased from 16,038 t in 1985 to 12.883 in 1989, a reduction of 20% in 4 years.

Fertilizer usage on rice, where 65% of country's fertilizer is consumed shows: (1) an unbalanced nutrient ratio of 196-12-20 kg/ha, (2) an estimated 45% of the urea nitrogen is lost due to improper application, (3) poorly maintained irrigation facilities and inefficient use of irrigation water, (4) poor land preparation and cultivation, (5) lack of applied agrotechnology for crop production, and (6) unstable farm-gate prices for rice due to the low price of imported rice.

Heavy soil erosion of vegetable and other crop areas in the mountains.

The factors that caused the reduction in fertilizer consumption have been identified and will serve as a clear basis for formulating the most appropriate programs for recovery.

Treat rice as the priority crop not only because it is the country's staple food but it also offers the highest potential for improved production and the opportunity to achieve self-sufficiency to eliminate imports. It is the major area of concentration to provide the appropriate technical and agronomic services for the proper use of production inputs. The rice crop should also be the priority crop for government and foreign assistance programs designed to rehabilitate the irrigation system, provide farm produce support prices, and production credit.

Technical service on soil conservation and contour farming.

Lack of a reliable network of dealers to efficiently supply crop production inputs, establish an efficient network of inputs, and provide agronomic information and advice (technical assistance) to the farmers. Establish an efficient network of dealers and implement a dealer development program.

Competition; in this area it is clear that (1) the foreign competitor's strength and capabilities can erode fertilizer prices and (2) domestic competitors will aggressively seek to protect their share of market.

Meet foreign competition on the basis of (1) lower production cost to support competitive selling prices, (2) accessibility of fertilizer supplies and formulation of proprietary complex blends according to buyer's specifications, (3) cooperation with one of the foreign fertilizer companies from the Dominican Republic as an equity partner in the proposed project, (4) provide technical assistance to dealers and farmers, and (5) work towards seeking government protection through taxation of imports of finished (NPK) fertilizer products.

Meet domestic competition by
(1) recognizing their market and their
role in the existing marketing and
distribution channels by appointing
them as the company's initial dealer
network base, and (2) inviting
importers, dealers, farmers' associations, and operators of large
plantation farms to join as investors
in the company and become "built-in
buyers" of the company's products.

Severe lack of distribution and production credit.

Offer credit on secured bases as a part of the total sales program package to dealers; encourage dealers to extend selective production credit to farmers.

Technical service programs and dealer training for network development are relatively costly to develop and will require substantial initial funding. Seek funding assistance from foreign dono, and investment organizations whose mission includes this type of technical assistance for agriculture in developing countries.

Japanese-donated fertilizers, which are sold at 60% of f.o.b. cost, disrupt the market.

Make representations to have the fertilizer sold at prevailing commercial prices. Participate in the donor fertilizer sales and distribution business and negotiate to supply locally the complex NPK grades currently offered by donors.

Lack of linkage between the fertilizer industry and agricultural agencies in the government.

Initiate an industry-lobbying organization of fertilizer suppliers and/or importers and establish linkages with government agricultural production programs.

The corporate image of the proposed company as a credible supplier of quality products and reliable services will take time to develop and will require a considerable outlay of funds.

Initiate a yearly corporate public relations project for the agricultural community through joint sponsorship with prestigious organizations, such as civic clubs, Haiti Press Club, and the Ministry of Agriculture, with prizes and awards solicited from donors.

Limited reliability of government agronomists to provide urgently needed extension services.

Hire a highly qualified agronomist to administer the company's field sales and technical services programs; tap the most capable government agronomists to extend and support the work initiated by the company's agronomist.

Lack of current reliable and updated sources of information on competitors' activities and the Haitian fertilizer market in general.

Establish reliable "listening posts" as sources of information at the fertilizer business centers; establish a monitoring system and an evaluation and recording system to monitor results/information on a monthly basis.

The small size of the fertilizer market offers limited business for the company.

Develop the complementary products business to generate additional revenues and to maintain a high profile in the agricultural community.

Lack of foreign currency to import the fertilizer raw materials and complementary products. Explore fertilizer export possibilities to other Caribbean countries for blended complex grades to earn foreign currency. Explore the possibility of bagging bulk material for re-export to small markets on a tolling arrangement.

<u>Information Based Marketing Assumptions</u>--Based on the assessment of the fertilizer market and marketing system, the assumptions specific to the 1992-96 marketing plan follow:

- a. The assumptions postulated in forecasting the fertilizer market from 1992 to 1996 will prevail (refer to 3.1.3).
- b. The proposed blending and bagging plant can produce quality bagged fertilizer grades at costs that can profitably compete in the market against prices offered by an efficient fertilizer importer.
- c. Some local importers, dealers, operators of plantation and industrial crop farms, farmers' associations and cooperatives, and the Assistant to the President of FERQUIDO in the Dominican Republic will fulfill their commitment to join and invest in the project; the local investors will become the "built-in customers" of the company thereby decreasing the strength of foreign and domestic competition.
- d. Most of the existing importers and dealers will be appointed as the company's initial marketing and distribution network.
- e. The company can negotiate with the Ministry of Agriculture (Government of Haiti) and the Government of Japan through its Embassy, to source locally from the proposed project the supply of complex NPK grades for the annual Japanese fertilizer donation.
- f. Foreign assistance funding can be obtained and becomes available in 1992 to support soil and tissue testing, farm demonstrations, and dealer training programs which are necessary to improve farm practices and services.
- g. The company can profitably market proprietary NPK fertilizer blends for custom application on plantation and industrial crops.
- h. The company will have the necessary manpower organization and material resources to support the sales and marketing plan from 1992 to 1996.
- i. The Government of Haiti will not promulgate policies or regulations that will harm the fertilizer business.
- j. The company will be able to obtain an annual market share of 30%, 45%, 55%, 65%, and 55% out of the total commercial fertilizer market; 20% of the sales of the annual Japanese fertilizer donation; and participate in the business of complementary products for the next 5 years.

<u>Sales and Program Objectives</u>--The sales objectives of the company's marketing plan from 1992 through 1996 follow:

 Sales objectives for commercial market and for Japanese donation, 1992-96.

	Commercial Ma	arket	Japan Donation	Total	
<u>Year</u>	% Market Share	t	20% Market Share	Sales	
			(t)	(t)	
1992	30	3,271	500	3,771	
1993	45	5,151	500	5,651	
1994	55	6,611	500	7,111	
1995	65	8,360	500	8,860	
1996	65	9,029	500	9,529	

2. Sales objectives by product and nutrient, 1992-96.

Product	1992	1993	1994 (t)	1995	1996
Urea Ammonium	2,451	3,560	4,409	5,316	5,527
sulfate	57	113	142	177	191
20-20-10	94	113	142	177	191
12-12-20	980	1,582	2,062	2,658	3,049
14-14-14	189_	283	356	<u>532</u>	<u>572</u>
TOTAL	3,771	5,651	7,111	8,860	9,529

Nutrient	1992	1993	1994 - (t)	1995	1996
N	1,302	1,914	2,384	2,911	3,066
P2O5	163	252	326	484	484
K2O	243	384	498	656	<u>743</u>
TOTAL	1,708	2,550	3,207	3,996	4,294

3. Fertilizer sales objectives by consumption area, 1992-96.

		1992								
			Ammonium							
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-14	Total			
					(t)					
Artibonite	Rice, onions	1.593	37	61	637	123	2,451			
Leogane	Maize, industrial tomatoes	49	1	2	20	4	75			
Kenscoff	Vegetables (all kinds)	294	7	11	118	23	452			
Foret des Pins	Potatoes, coffee, onions, cabbage	172	4	7	69	13	264			
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	147	3	6	59	11	226			
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	123	3	5	49	9	189			
Cap Haitien	Cane, citrus, onions, other vegetables		_2	_3		6_	_ 113			
TOTAL		2,451	57	94	980	189	3,771			

		1993								
			Ammontum							
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-14	Total			
					(t)					
Artibonite	Rice, onions	2,314	73	73	1,029	184	3,673			
Leogane	Maize, industrial tomatoes	71	2	2	32	6	113			
Kenscoff	Vegetables (all kinds)	427	14	14	190	34	678			
Foret des Pins	Potatoes, coffee, onions, cabbage	249	8	8	111	20	396			
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	214	7	7	95	17	339			
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	178	6	6	79	14	283			
Cap Haitsen	Cane, citrus, onions, other vegetables	107	_3	3	47	8	170			
TOTAL ·		3,560	113	113	1,582	283	5,651			

		1994					
			Ammontum				
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-14	Total
					(t)		
Artibonite	Rice, onions	2,866	92	92	1,340	231	4.622
Leogane	Maize, industrial tomatoes	88	3	3	41	7	142
Kenscoff	Vegetables (all kinds)	529	17	17	247	43	853
Foret des Pins	Potatoes, coffee, onions, cabbage	309	10	10	144	25	498
Cul de Sac	Tobecco, industrial tomatoes, other vegetables	265	9	9	124	21	427
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	220	7	7	103	18	356
Cap Haitien	Cane, citrus, onions, other vegetables	132			62		213
TOTAL		4,409	142	142	2,062	356	7,111

		1995						
		Ammon: um						
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-14	Total	
					(t)		·	
Artibonite	Rice, onions	3,455	115	115	1,728	346	5.759	
Leogane	Maize, industrial tomatoes	106	4	4	53	11	177	
Kenscoff	Vegetables (all kinds)	638	21	21	319	64	1.063	
Foret des Pins	Potatoes, coffee, onions, cabbage	372	12	12	186	37	620	
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	319	11	11	159	32	532	
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	266	9	9	133	27	443	
Cap Haitien	Cane, citrus, onions, other vegetables	159		5	80		266	
TOTAL		5,316	177	177	2,658	532	8,860	

		1996					
Area	Сгор	Urea 	Ammonium Sulfate	20-20-10	12-12-20 (t)	14-14-14	Total
Artibonite	Rice, onions	3,592	124	124	1,982	372	6,194
Leogane	Maize, industrial tomatoes	111	4	4	61	11	191
Kenscoff	Vegetables (all kinds)	663	23	23	366	69	1,143
Foret des Pins	Potatoes, coffee, onions, cabbage	387	13	13	213	40	667
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	332	11	11	183	34	572
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	276	10	10	152	29	476
Cap Haitien	Cane, citrus, onions, other vegetables	166	_6	6	91		286
TOTAL		5,527	191	191	3,049	572	9,529

4. Fertilizer sales objectives by quarters, 1992-96.

Quarter	1992	1993	(t)	1995	1996
<pre>lst (Jan-Mar) 2nd (Apr-Jun) 3rd (Jul-Sep) 4th (Oct-Dec)</pre>	943 1,131 867 830	1,413 1,695 1,300 1,243	1,778 2,133 1,635 1,564	2,215 2,658 2,038 1,949	2,382 2,859 2,192 2,096
TOTAL	3,771	5,651	7,111	8,860	9,529

5. Complementary product sales objectives, 1992-96.

Products	1992	(thous	1994 and ILS dol	1995	<u>1996</u>
Pesticides					
	75	100	120	150	175
Sprayers	2	5	5	5	5
Seeds	10	30	50	75	100
Farm tools	<u>-</u> :	2	5	5	5
TOTAL	87	137	180	235	285
					

The choice of the appropriate marketing programs takes into account the priority needs of the market and marketing system. The need for reliable marketing channels, which can efficiently service the farmers, and the need for farmers to improve their farming practices are identified as the critical priorities.

To satisfy these needs, the most urgently needed and recommended marketing programs include (1) soil testing, (2) farm demonstrations, (3) dealer training and development, and (4) a strong community relations program. These recommendations are based on the experiences of other developing countries similar to Haiti where such programs have worked successfully.

The program objectives of the marketing plan from 1992 to 1996 follow:

1. Soil testing and fertilizer recommendation program.

		Le	vel of Activ	ity	
Crop/Soil Tests	1992	1993	1994	1995	1996
		(nu	umber of samp	les)	-
Rice/soil samples	None	1,850	1,925	2,092	2,145
•	None	(25)ª	(35) ^a	(45)ª	(65)ª
Vegetable/soil samples	None	100	200	300	300
Other crop/soil samples	None	100	200	300	300
TOTAL	None	2,250	2,325	2,692	2,745

a. Values in parenthesis indicate number of samples per dealer assuming a 50% level of performance.

2. Farm demonstrations and field day programs.

	Le			
1992	1993	1994	1995	1996
		-(number)-		
None	40	50	60	70
None	4	4	6	6
None	10	10	10	10
None	1	2	4	4
None	10	10	10	10
None	2	2	4	4
None	40	70	80	90
None	7	8	14	14
	None None None None None	1992 1993 1993 1993 1992 1993	1992 1993 1994 None 40 50 None 4 4 None 10 10 None 1 2 None 10 10 None 2 2 None 40 70	None 40 50 60 None 4 4 6 None 10 10 10 None 1 2 4 None 10 10 10 None 2 4 None 2 80

Note: Field days are conducted on the basis of selected successful demonstrations to benefit neighboring farmers.

3. Dealer training and network development.

	Level of Activity				
Item/Activity	1992	1993	1994	1995	1996
Annual fertilizer sales objective (t)	3,710	5,540	6,990	8,690	9,950
Number of dealers needed	148	110	93	86	66
Average annual sales per dealer (t)	25	50	75	100	150
Number of quarterly dealer performance evaluations	4	4	4	4	4
Dealer training programs	None	2	2	2	2

Note: Dealer selection starts in 1992; training in 1993. The goal is for dealers to achieve a profitable sales volume for the dealership business.

4. Community relations program.

This is a corporate public relations program (CPRP) for the agricultural community; a "doing something good and talking about it" program. The objective of the CPRP is to establish a credible image of the company, its products and services, and the company's important role in the agricultural development of the country.

A CPRP on "The Outstanding Rice Farmer and Agronomist of the Year" is recommended. This program would be conducted on a joint sponsorship with a prestigious civic organization, the Haiti Press Club, and the Ministry of Agriculture of the Government of Haiti. Prizes donated by companies doing business in agriculture would be awarded. This should be an annual CPRP event for the company.

Marketing Strategies and Action Plans--The strategies provide directions to the operations of the plan, while the action plan outlines the key action steps or activities that must be performed to realize the expected results of the plan. The strategies and the action plan dovetail the sales and program objectives of the plan for the period from 1992 to 1996.

Strategy and action plan for the 5-year period 1992-96:

Strategy

Action Plan/Kev Action Steps

Incorporate a production and marketing company; adopt a company name/logo which can be carried as product brand in packaging, with good product recall.

The company Directors to appoint the executive officers, defining their responsibilities and authorities during the first Board meeting; corporate management to hire the required personnel as needed, and select appropriate company logo design for 1992 operations.

Competitive selling prices.

Corporate management to establish the break-even cost of products; competitive selling prices by market center location; set up a pricing mechanism to handle direct sales; have product price list ready 1 month before plant production begins and 2 months before executing supply agreement with customers/dealers.

Respect the existing markets of importers and dealers by initially channeling sales through them in 1992.

Marketing management to appoint the required number of dealers sufficient to support the attainment of the sales objectives in 1992; execute supply contract agreements with dealers/accounts; secure the major sales volume commitments of accounts by offering credit lines secured by cash bonds (treat cash advance for purchases as cash bonds) to earn interest; all action steps to be completed 2 months before plant production begins.

Establish a reliable dealer network.

Marketing management to develop and implement a dealer network development program on a sustained effort starting in 1992 through 1996; provide for a quarterly performance review, dealer classification and upgrading, semestral dealer training, and year-end sales performance incentive system.

Product and sales development.

Marketing management to concentrate on the sales development of proprietary complex NPK blends for custom application on sugarcane, tobacco, industrial tomatoes, and chinese vegetables.

Concentration of sales effort/ support to the rice and vegetable crop markets. Marketing management to establish field warehouses (dealer operated) strategically located in the major market centers of Artibonite Valley. Kenscoff, and Les Cayes starting in 1993; utilize these field warehouses as sales outlets to service dealer or direct customers whenever or wherever applicable to maximize sales; require dealers to conduct farm demonstrations and field days and soil sampling for soil testing services as part of dealer development according to yearly program objectives for period of 5 years subject to availability of funding assistance.

Package credit with sales program on secured basis.

Marketing management to forward fertilizer stocks with selected dealers in high market volume areas utilizing the dealer's warehouse with scheduled invoicing at delivered prices (to dealer's warehouse), secured with post-dated checks, and renewable quarterly; similar arrangement to be pursued with plantation accounts and large farm accounts.

Supply locally the yearly requirement for complex NPK grades for the Japanese fertilizer donation.

Marketing management to negotiate with Ministry of Agriculture/
Government of Haiti and Japanese
Embassy to supply the complex (NPK)
fertilizer donation from local
production each year starting in 1993.

Seek foreign funding assistance to implement soil and tissue testing, farm demonstrations, and dealer training development programs.

Corporate management to prepare and submit proposal to the Special Industrial Service (UNIDO) for funding assistance with the technical service and dealer training programs; to be completed 1 month after the plant starts production; implementation of the technical service and dealer training programs will be dependent upon availability of funding assistance.

Linkage with Government of Haiti crop production programs.

Corporate management to establish relationship with government crop production agencies and participate whenever possible in agricultural council activities after the company is organized.

Initiate a yearly corporate public relations project (CPRP).

Corporate management will develop and implement a CPRP project on "The Outstanding Rice Farmer and Agronomist of the Year" starting in 1993 through 1996; project should be cosponsored by a civic club, Haiti Press Club, and Ministry of Agriculture of the Government of Haiti with prizes donated by agricultural product suppliers.

Obtain services of highly qualified technical sales representative.

Marketing management to hire a highly qualified agronomist who can handle both the field extension services and sales programs within the dealer network. Should also function as technical sales representative and liaison with government agronomists.

Maintain up-to-date data and information on competition and the Haitian fertilizer market.

Marketing management to establish "listening posts" to monitor competition and markets; maintain an updated monthly fertilizer market data, sales, and program results report.

Regular monitoring of competition.

Marketing management to keep track of competitors' sales activities monthly, and neutralize their efforts.

Develop the allied products business to generate additional revenues using fertilizer products as the primary sales vehicle. Marketing management to source and negotiate supply contracts with supplies of pesticides, sprayers, seeds. and farm tools at the best price and terms possible starting in 1992 on a sustained annual effort to improve and complete the company's product line; complete in 2nd quarter of 1992.

To further guide the first year marketing operation, the 1992 marketing plan and program is presented in more detail.

3.3 The 1992 Marketing Plan

This plan covers only the first year of the proposed 5-year marketing plan. It is presented in detail so it can serve as the operating guide (manual) for the marketing function.

The foregoing listing of facts about the Haitian fertilizer market and marketing system identified problems and opportunities which were summarized in the 5-year marketing plan. Most of these problems and opportunities are expected to occur in the first year and since these have already been discussed, they will not be repeated. It is enough to state, however, that these problems and opportunities were taken into careful consideration in the development of the plan.

There is no one time solution to a problem; problems "solved" in the first year will most likely produce new problems later on. Solutions to problems must be therefore evaluated carefully before they are applied to ensure that larger and more complicated problems are not created.

What is most important is to understand that problems also create opportunities; if these are identified and properly exploited, there is most likely something to be gained.

3.3.1 <u>1992 Assumptions</u>

The following assumptions are the postulated conditions under which the marketing plan will successfully operate in 1992. These are categorized into internal and external assumptions. The internal assumptions are those which concern and/or relate to the internal affairs of the company and its management, while the external assumptions are those which relate to the external environment of the market.

Internal Assumptions

- That the company can produce quality fertilizer products at production costs which can profitably compete with competition from efficient fertilizer importers.
- 2. That the Assistant to the President of FERQUIDO will make good his personal commitment to join Mr. Jean-Michel Cherubin (the project's promoter) and invest in the project thereby reducing the threat of foreign competition from the Dominican Republic.
- 3. That some importers, dealers, farmers' associations and cooperatives, and operators of plantations and industrial crop farms invited to join and invest in the blending plant will make good their intentions and will become "built-in customers" of the company for its products.
- 4. That a good number of existing importers and dealers can be appointed as the company's initial marketing and distribution channels.
- 5. That the company will have the necessary manpower organization and material resources to implement the marketing plan for 1992.
- 6. That the company will be able to obtain a 30% share of the fertilizer market in 1992.

External Assumptions

- 1. That the assumptions postulated in forecasting the fertilizer market in 1992 will prevail.
- 2. That the Ministry of Agriculture of the Government of Haiti and the Government of Japan through its Embassy will agree to source the supply of complex NPK grades locally for the annual Japanese fertilizer donation.

- 3. That a foreign organization will be willing to provide funding assistance to support soil testing, farm demonstrations, and dealer development/training programs.
- 4. That production of rice will be a priority program for the newly elected Government of Haiti.
- 5. That the Government of Haiti, through its ministries, will not promulgate policies or regulations that will harm the fertilizer business.

3.3.2 1992 Sales and Program Objectives

The sales and program objectives, directed to the opportunities of the fertilizer market and the market forecast assumptions for 1992, follow.

1992 Total Fertilizer Market Forecast

Product	Commercial Market	Japan Donation (t)	Total <u>Market</u>
Urea	6,541	1,000	7,541
Ammonium sulfate	545	500	1,045
20-20 - 10	218	0	218
12-12-20	3,271	500	3,771
14-14-20 ^a	327	500	827
TOTAL	10,902	2,500	13,402

a. 14-14-20 is composite average nutrient analysis of miscellaneous products.

The company's sales forecast will be 30% (3,271 t) of the commercial market and 20% (500 t) of Japanese fertilizer donation for a total of 3,771 t. The company's fertilizer sales objective by product and quarter for 1992 follows.

1992 Fertilizer Sales Objective by Product and Quarter

	Quarter					
Product	First	Second	Third	Fourth	<u>Total</u>	
			(t)			
Urea	613	735	564	539	2,451	
Ammonium sulfate	14	17	13	13	57	
20-20-10	24	28	22	20	94	
12-12-20	245	294	225	216	980	
14-14-14	<u>47</u>	57	_43	42	189	
TOTAL	943	1,131	867	830	3,771	
% of total	25	30	23	22	100	

In addition to urea and ammonium sulfate, the company will produce the standard complex NPK blends plus 14-14-14 to replace the nutrients contained in the 14-14-20 composite.

About 65% or about 2,450 t of the fertilizer sales objective will be consumed in the Artibonite Valley where the major crops are rice and onions. The company's sales objective by consumption area is presented below.

1992 Fertilizer Sales Objective by Consumption Area

Area	Crop	Urea	Ammonium Sulfate	20-20-10 (t)-	12-12-20	14-14-14	Total
Artibonite	Rice, onions	1,593	37	61	637	123	2,451
Leogane	Maize, industrial tomatoes	49	1	2	20	4	75
Kenscoff	Vegetables (all kinds)	294	7	11	118	23	452
Foret des Pins	Potatoes, coffee, onions, cabbage	172	,	7	69	13	264
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	147	3	6	59	11	226
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	123	3	5	49	9	189
Cap Haitien	Cane, citrus, onions, other vegetables	74	_2.	_3_	29	6	113
TOTAL		2,451	57	94	980	189	3,771

The proposed fertilizer price list in Haitian dollars (H \$) closely matches the June 1990 prices of fertilizer importers to dealers as follows:

	Proposed Fertiliz	er Selling
	Prices to Curren	
	(f.o.b. factor	y gate)
Product	Per 50-kg Bag	Per t
	(H \$)	· -
Urea	16.0	318
Ammonium sulfate	12.5	244
20-20-10	17.5	347
12-12-20	16.0	318
14-14-14 ^a	17.0	340

a. 14-14-14 is not currently imported.

The above selling prices will have a discounting provision of less 5%, less 5%. This discount will be used to service importers and meet any price reduction of the foreign competition. With this discounting, the net selling prices (factory gate, not including delivery) in Haitian dollars (H \$) will be as follows:

	Net (Discounted) <u>Selling Prices</u> t	
Product	Per 50-kg Bag	Per t
	(H \$)	
Urea	14.4	287
Ammonium	11.1	221
sulfate		
20-20-10	15.8	314
12-12-20	14.4	287
14-14-14	15.4	307

Based con the commercial market sales objective of 3,271 t (not including the Japanese donation) and the net (discounted) selling prices, the sales revenue for 1992 will be as follows:

1992 Fertilizer Sales Revenue Objective for the Commercial Market

Product	Market Share (%)	Sales Volume	Net Price (H \$/t)	Sales Revenue (H \$)
Urea	65.0	2,126	287	610,162
Ammonium sulfate	1.5	49	221	10,829
20-20-10	2.5	82	314	25,748
12-12-20	26.0	850	287	243,950
14-14-14	5.0	<u>164</u>	307	50,348
TOTAL	100	3,271	_ 444	941,037

There is a strong potential business for allied products, not only to complete the company's product line but also to generate additional revenues. These products include pesticides, seeds, sprayers, and farm tools. It is normal to obtain a 25%-45% margin from these products. Sourcing and negotiating the supply, price, and other terms of these products should be completed within the first quarter of 1992. Marketing will start in the second quarter of 1992. The 1992 gross sales objective for these allied products is presented below. Assuming a 25% margin, the projected gross sales revenue of US \$148,000 would amount to a net revenue of about US \$37,000 for 1992.

1992 Allied Product Gross Sales Objective

Quarters						
Product	First	Second	Third	Fourth	Total	
		·	(thousand US	\$)		
Pesticides	0	40	30	30	100	
Seeds	0	15	12	13	40	
Sprayers	0	2	2	2	6	
Farm tools	$\overline{0}$	<u>. :</u>	_1	_1	2	
TOTAL	0	57	45	46	148	
% of total	0	39	30	31	100	

The program objectives of the 1992 marketing plan follow:

Dealer Network Development

- Appoint 148 dealer/accounts in January 1992 to support the quarterly sales forecast at an average sales volume of 25 t/dealer or account for the year.
- Conduct quarterly sales performance evaluations of the 148 appointed dealers and accounts as the basis for selection for further upgrading.

Sales Fromotion/Advertising

- Implement the recommended sales promotion programs focused on the rice market in Artibonite Valley and on vegetables in Kenscoff.
- 2. Implement 30-second fertilizer radio spot commercials before and during the rice planting months of the year.
- Implement, with selected dealers and accounts, a forward stocking program, tying secured credit sales with the dealer's warehousing facilities.
- 4. Establish fertilizer credit lines with dealers and other accounts secured by cash bonds providing an attractive interest earning.

Soil Testing, Farm Demonstrations, and Dealer Training

- Obtain foreign funding assistance to support these programs in 1993 by submitting funding proposals in the second quarter of 1992.
- Develop and prepare the programs of implementation for 1993, including dealer participation.

3.3.3 1992 Marketing Strategies

Taking into account the problems and opportunities of the fertilizer market in 1992, the strategies which will give direction to the implementation of the marketing plan follow.

Product

- 1. Attractive packaging with good brand recall and "imported image."
- Confine initial production to standard NPK blends already accepted in the market.
- 3. Negotiate to supply complex NPK grade requirements of the Japanese fertilizer donation.

- Develop the allied product business to complete the line of products offered.
- Develop sales of proprietary fertilizer NPK blends for custom crop applications.

<u>Price</u>

- Provide competitive product selling price to (a) importers,
 (b) dealers, and (c) direct user (large farms and plantations) accounts.
- 2. Regularly monitor prices and activities of the competition.
- Package fertilizer prices together with credit and sales programs.
- 4. Establish a pricing mechanism to meet prices of legitimate competition.

<u>Place</u>

- Respect existing markets of importers and dealers by channeling sales through them.
- 2. Start the development of a reliable dealer network.
- 3. Utilize dealers' warehouses to implement forward stocking and secured credit.
- 4. Encourage large volume dealers to establish their own sales outlets.

Promotion

- Concentrate sales promotion and sales services programs in the rice and vegetable markets primarily in Artibonite Valley and Kenscoff regions.
- 2. Package secured credit with sales programs to secure sales.
- Seek foreign funding assistance to support soil testing, farm demonstrations, and dealer training programs.
- 4. Hire a highly qualified agronomist to handle field technical assistance and sales service programs.

3.3.4 <u>1992 Action Plan</u>

The action plan specifies the key action steps to be performed within a definite timeframe by the person(s) responsible in order to realize the results of the sales objectives set forth for 1992. A summary of the key action items follows.

	Timeframe, 1992		Key Action Step		Responsibility
1.	Before January 1992	1.	Hire highly qualified agronomist to function as technical sales representative and be responsible for field technical assistance, and sales services	1.	Marketing Management
2.	Ready before January	2.	Confidential fertilizer price list for importers, dealers, and direct accounts	2.	Marketing Management/Technical Sales Representative
3.	Before January	3.	Appoint marketing network and execute supply agreement	3.	Marketing Management/Technical Sales Representative
4.	January and monthly thereafter	4.	Monitor prices and activities of foreign and local competition to establish basis for managing the actions necessary	4.	Technical Sales Representative
5.	January and monthly thereafter	5.	Monitor and actively participate in government agricultural production program; establish liaison with government decisionmakers in agriculture	5.	Marketing Management/Technical Sales Representative
6.	January and monthly thereafter	6.	Concentrate sales promotional activities in Artibonite Valley for rice and Kenscoff for vegetables (refer to Appendix I for sales promotion mechanics)	6.	Technical Sales Representative
7.	January and monthly thereafter	7.	Concentrate on sales service to operators of plantation and industrial crops for premium custom NPK blend formulations on a delivered price basis	7.	Technical Sales Representative
8.	April-June	8.	Select reputable performing dealers with warehouses to implement forward stocking programs (Refer to Appendix II for program mechanics)	8.	Marketing Management/Technical Sales Representative
9.	April-June	9.	Establish account credit line by implementing cash bond program to generate credit sales on secured basis (Refer to Appendix III for program machanics)	9.	Marketing Management/Technical Sales Representar; re
10.	April-June	10.	Negotiate with Ministry of Agriculture/Government of Haiti and Japanese Embassy to source complex NPK grades locally for annual Japanese fertilizer donation	10.	Marketing Management
Ι.	April-June	11.	Prepare and submit proposal to the Special Industrial Service Division (UNIDO) for funding assistance to support soil testing, farm demonstrations, and dealer training programs	11.	Corporate Management

	Timeframe, 1992		imeframe, 1892 Key Action Step		Responsibility		
12.	September	12.	Assist dealer training program, prepare action plan of dealer-assisted soil testing and farm demonstration program for 1993 (Refer to Appendixes IV and V for mechanics)	12.	Marketing Management/Technical Sales Representative		
13.	October-December	13.	Select dealers for dealer training; dealer training for network development	13.	Marketing Management/Technical Sales Representative		
14.	January-June	14.	Source and negotiate supply contracts for pesticides, sprayers, seeds, and farm tools	14.	Corporate Management		
15.	April	15.	Start promotional sales of complementary products with dealers and other accounts	15.	Technical Sales Representative		
16.	November	16.	Prepare marketing plan for 1993	16.	Marketing Management		

3.3.5 Sales Program Support

Refer to Appendixes I through V for sales program support materials for the following programs.

- 1. Sales promotion (Appendix I).
- 2. Forward stocking program (Appendix II).
- 3. Cash bond program (Appendix III).
- 4. Technical services program (Appendix IV).
- 5. Dealer training (Appendix V).

3.3.6 Marketing Plan Evaluation

The marketing plan should be evaluated quarterly to measure its performance and to possibly update and modify to improve its effectiveness during the year. The results and experience gained from the operations of the marketing plan will provide useful information for formulating an improved marketing plan for 1993.

Table 3-1. Major Agricultural Areas and Crops, 1986

Agricultural Area	7 of Total	Population <u>Density</u> (persons/km²)	Principal Crops
Arid and semiarid plains	45	77-200	Maize, millet, peas, beans
Mountainous (dry)	25	39-100	Maize, millet
Mountainous (humid)	15	200	Coffee, vegetables, fruits
Plains (humid)	10	300-400	Rice, maize, bananas, fruits, sugarcane
Plains (irrigated)	5	650	Rice, bananas, vegetables, tobacco
	100		LODACCO

Source: Hatch Associates Ltd. 1986. Engineering & Financial Analysis, Volume I--The Report, and Volume II--Appendices and Drawings, Toronto, Ontario, Canada.

Table 3-2. Monthly Precipitation, 1984-87

							Mo	nth							
Region	<u>Year</u>	Jan.	Feb.	Mar.	Apr.	May	Juna	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Average
								(m	n)		. .				
Cap Haitien	1984	109.1	173.4	49.8	190.0	24.5	122.2	32.3	26.0	120.0					
	1985	175.8	203.9	261.0	140.7	46.8	38.4	34.3 84.2	26.0 54.3	139.0 104.6	115.0	184.1	52.4	1,217.8	101.5
	1986	155.7	18.0	136.5	168.5	112.8	23.8	4.5	40.5	20.2	80.2 148.5	94.2	17.5	1,301.6	108.5
	1987	233.2	49.1	202.5	501.Σ	241.9	43.8	17.1	73.3			13.2	53.1	898.3	74.9
				202.3	301.5	444.0	43.0	17.1	73.3	79.5	289.3	153.0	247.5	2,132.1	177.7
Artibonite Valley															
 Gonaives 	1984	60.9	21.5	33.5	39.6	23,3	134.0	43.2	38,2	151.8	20.4	37.5	6.7	610.6	50.9
	1985	0.5	8.7	0.3	62.0	44.0	77.0	64.6	78.8	20,7	74.6	83.4	0	514.5	42.5
	1986	14.6	3.5	60.5	36.6	110.2	74.9	65.1	78.2	33,4	15.2	0	0	492,2	41.0
	1937	19.8	52.5	65.9	56.7	104.0	149,2	43,5	56.6	171.6	53,2	2.5	36.0	718.9	59.9
b. St. Marc	1984	32.5	58.3	14.5	117.5	81.3	230.6	102,8	185.9	249.5	220,9	14.0	1.0	1,308.8	100 1
	1985	0.0	26.5	0.0	114.5	150.0	58.0	279.5	163.2	159.7	103.1	79.4	0.0	1,300.0	109.1 94.5
	1936	50.5	16.0	228.5	40.5	86.0	145.3	162.0	265.5	131.5	54.5	12.5	0.0	1,192.5	99.4
	1987	15.0	8.0	58.0	47.0	30.0	79.0	101.4	144.6	104.1	61.1	45.8	49.0	743.0	61.9
c. Maisiada	1984	45.8	113.9	30.0											
C. Maistada	1985	10.5	129.1	70.9 55.6	73.7	480.5	573.6	111.2	126.1	742.3	467.9	15.4	9,4	2,830.7	235.9
	1935	12.8	66.2		60.8	219.0	159.5	150.4	129.8	230,6	382.0	178.6	8,6	1,714.5	142.9
	1987	18.2	71.5	259.4 41.2	245.8	388.4	214.0	261.4	102.2	114.6	307.8	9.2	21.0	2,002.8	166,9
	1957	10.2	71.5	41.2	145.0	358.0	230.8	216.2	178.8	121.2	379.0	112.6	40.0	1,912.5	159.4
d. Mizebolais	1984	113.7	63.1	53.0	45.6	140.5	260.0	214.7	252.2	332.4	257.7	23,3	19.0	1,775.2	147.9
	1935	3.0	36.4	62.2	141.6	151.9	72.3	237.6	329,2	376.4	279.8	174.4	32.0	1,895.8	157.9
	1936	58.6	10.0	214.8	180,0	294.8	138.0	167.8	129.6	148.0	192.4	76.8	28.4	1,639.2	136,6
	1937	6.0	21.0	29.8	201,0	411.0	116.2	220.2	336.4	294.0	295.2	48.0	51.4	2,031.2	169.3
Leogane	1934	40.2	88.3	23.8	28.5	200.5	224.7	102.8	61.4	251.0	158.9	12.4	36.9	1,234,4	102.9
	1955	84.6	29.1	171.1	120.6	85.4	49.4	75.9	116.7	216.0	133.3	150.9	0	1,233.0	102.8
	1986	105.1	20.8	168.1	184.9	228.7	174.4	142.1	139.1	70.9	136.3	97.7	ŏ	1,468.1	122.3
	1957	5.3	38.2	17.8	153.6	142.0	193.8	110.7	75.9	97.9	141.3	86.2	108.2	1,170.9	97.6
Furcy	1984	50.8	100.0	69.6	132.4	400.2	483.6	246.0	106,6	259.4	292.4	43.4			
	1985	15.8	32.2	62.6	136.6	196.8	105.6	281.8	150.0	130.6	201.4	57.4 172.2	17.8	2,216.2	184 7
	1935	107.4	10.8	139.8	149.6	347.0	223.0	152.2	184.6	181.0	201.4	45,2	8.4 30.5	1,494.0	124.5
	1987	43.4	47.8	22.8	75.8	149.4	446.2	182.4	134.2	239.4	351.8	50.6	88.0	1,774.8	142.9
							110.2	.02.4	207,2	255.4	331.0	30,0	80.0	1,831.8	152.6
Foret des Pins	1984	51.0	45.4	53.2	81.4	209.4	0	39.0	109.2	258.2	305.6	13.2	0	1,155.6	97.2
	1935	9.4	16.4	4.2	112.7	137.0	142.1	97.6	130.0	128,6	274.6	31.0	9.4	1,143.0	95.3
	1936	42.2	26.4	66.2	203.6	254.2	108.2	79.2	139.0	111.6	44.8	94.0	31,4	1,200.8	100.1
	1987	34.8	42.4	28.8	47.9	321.0	169.0	99.0	148.2	93.0	257.0	27.0	184.0	1,452.1	121.0
Les Cayes	1984	64.5	162.9	108.5	151.8	170.3	71.6	177.5	76.6	409.3	116.1	46.7	2.0	1,557.8	129.8
	1985	47.8	136,3	91.9	174.4	175.6	20,2	48.3	180.4	183.4	314.6	29.3	45.9	1,448.1	120.7
	1986	55.4	19.2	61.3	128.2	262.8	677.9	41.4	39.8	85.9	195.6	165.2	68.7	1,801.4	150.1
	1937	85.8	96.7	64.4	102.6	110.9	84.4	73.4	77.0	135.2	421.2	103.9	147.1	1,502.6	125.2
Ganthier	1994	3.4	2,9	7.0	27.7	146.4	36.1	42.1	11.7	114.7	60 1	•	•	•	
	1985	11.0	5.6	2.1	99.6	1.7	0	17.6	86.4	138.6	69.1 164.8	0 98.1	0	461.1	38.4
	1986	28.7	11.5	17.6	138.1	153.5	17.8	6.4	4.3	79.4	96.8			625.5	52.1
	1987	0	1.4	3,6	136.2	152,4	48.1	0.4	0.7	131.7	241.2	145.0 23.4	2.1 31.3	701.2 770.0	58.4
		-	• • •	•.•		, '		•	٠.,	201.7	471.4	43,7	31.3	770.0	64.2

Source: Republique d'Haiti, Departement de l'Agriculture des Ressources Naturelles et du Developpement.

Table 3-3. Average Yields, Area Cultivated, and Production of Principal Crops, 1980-86

Crop	% of Total	Area	Average Yield		
		(ha)	(t/ha)		
Maize	22.0	231,250	0.8		
Sorghum	14.9	156,250	0.8		
Coffee	12.5	132,000	0.3		
Beans	8.5	89,655	0.6		
Sugarcane	10.8	114,000	50.0		
Banana (plantain)	7.7	80,645	0.7		
Cassava	2.7	28,000	4.0		
Sweet potatoes	5.9	61,905	0.5		
Rice (paddy)	5.6	59,250	2.3		
Peanuts	4.3	45,355	0.8		
Cocoa	1.0	10,400	0.3		
Cotton	1.2	12,445	0.5		
Taro	0.8	8,665	4.5		
Yams	2.1	22,000	5.0		
TOTAL	100	1,051,820			

Source: Service de Statistics Agricoles (MARNDR); 1987.

Note: The area cultivated to other vegetables (tomatoes, onions, cabbage, etc.) and other crops (tobacco, citrus, etc.) is about 35,000 ha; the total area cultivated to agricultural crops is estimated at 1,086,820 ha which is about 40% of total land area.

Table 3-4. Planting Seasons for Major Crops, 1988

Crop	Region	Months
Beans	Northern Plain	April-NovDec.
	Gonaives Plain	April-Dec.
	Artibonite Valley	NovDec.
	Cul de Sac Plain	FebMarch-Dec.
	Leogane Plain	December
	Cayes Plain	October-November
	North East Hillside	February
	North West Hillside	April-May
	South East Hillside	FebMarch-AugSept.
	Artibonite River Basin	March-April-AugSept.
	South West Hillside	FebMarch-July-Aug.
Maize	Northern Plain	April-May
	Gonaives Plain	FebMarch-Aug.
	Cul de Sac Plain	FebMarch-August
	Leogane Plain	JanFebMarch
	Cayes Plain	FebMarch-AugSept.
	North East Hillside	January
	North West Hillside	May-June
	Artibonite River Basin	March-April-May-June
	South East Hillside	March-April-NovDec.
	South West Hillside	March-April
Sugarcane	Northern Plain	OctNov.
	Cul de Sac Plain	March-April-May-June
	Leogane Plain	March-April-May
	Cayes Plain	March-April
Plantain	Northern Plain	March-April
	Cul de Sac Plain	March-April-AugSeptOct.
	Leogane Plain	March-April-May-AugSept Oct.
Vegetables	Northern Plain	SeptOct.
8-1-1-1	Artibonite Valley	NovDec.
	Cul de Sac Plain	AugSeptOct.
	Leogane Plain	OctNov.
	Cayes Plain	SeptOct.
	North West Hillside	OctNov.
	Artibonite River Basin	AugSeptOct.
	South East Hillside	March-April-May-Aug.
	South West Hillside	April-May-June
Rice	Northern Plain	AugOctNov.
	Artibonite Valley	January-July
	Cayes Plain	February-Aug.
	South West Hillside	July

Source: Agri News USAID/Haiti.

Table 3-5. Fertilizer Market, 1985-89

A. Product

Fertilizer

1985	1986	1987	1988_	1989
	• • • • • •	(t)		
9,623	9,043	7,942	7.853	7,729
802	754	662	•	644
321	301	265		258
4,811	4.521			3,221
	,	-,	2,,22,	3,221
<u>481</u>	452	397	393	1,031
16,038	15,071	13,237	13,089	12,883
	9,623 802 321 4,811	9,623 9,043 802 754 321 301 4,811 4,521 481 452	9,623 9,043 7,942 802 754 662 321 301 265 4,811 4,521 3,971 481 452 397	9,623 9,043 7,942 7,853 802 754 662 654 321 301 265 262 4,811 4,521 3,971 3,927 481 452 397 393

B. Nutrient

Nutrient	1985	1986	1987 - (t)	1988	1989
N P2O5 K2O	5,304 709 <u>1,090</u>	4,984 666 1,025	4,377 585 900	4,328 579 890	4,273 582 876
Total	7,103	6,675	5,862	5,797	5,731

a. 14-14-20 is composite average nutrient analysis of miscellaneous products.

Table 3-6. Fertilizer Recommendations for Major Crops

Стор	Fertilizer Recommendation (kg nutrient/ha) ^a
Rice (irrigated)	100-60-60
Maize (irrigated)	102-54-72
Maize (nonirrigated)	70-36-48
Beans	100-167-167
Cabbage	170-120-120
Sugarcane	100-82-224
Plantain/banana	140-30-270
Onion	85-60-160
Potatoes	80-83-171
Tomatoes (industrial)	148-76-184
Coffee (first and second years)	36-36-18
Coffee (succeeding years)	54-54-27

a. N-P2O5-K2O.

Source: Agricultural Services S.A. (ASSA) 1983 Calendar.

Table 3-7. 1992-96 Fertilizer Market Forecast by Product and Nutrient

A. Product

								Year							
		1992			1993			1994			1995			1996	
Product	Commercial Market	Japan Donation	Total Market	Commercial Market	Japan Donation	Total Market	Commercial Market	Japan Donation (t)	Total Market	Commercial Market	Japan <u>Donation</u>	Total Market	Commercial Market	Japan <u>Donation</u>	Total Market
Urea Ammonium sulfate	7,086 164	1,000 500	8,086 664	7,212 229	1,000 500	8,212 729	7,452 240	1,000 500	8,452 740	7,717 257	1,000 500	8,717 757	8,056 278	1,000 500	9,056 778
20-20-10	273	0	273	229	0	229	240	0	240	257	0	257	278	0	278
12-12-20	2,835	500	3,335	3,205	500	3,705	3,486	500	3,986	3,858	500	4,358	4,445	500	4,945
14-14-20 ^a (composite		500	1,045	572	500	1,072	601	500	1,101	772	500	1,272	833	500	1,333
Total	10,902	2,500	13,402	11,447	2,500	13,947	12,020	2,500	14,520	12,861	2,500	15,361	13,890	2,500	16,390

B. Nutrient

Nutrient	1992	1993	1994 (t)	1995	1996
N	4,450	4,571	4,724	4,921	5,165
P2O5	601	641	680	752	836
κ ₂ ο	903	978	1,041	1,152	1,283
Total	5,964	6,190	6,446	6,825	7,284

a. 14-14-20 is composite average nutrient analysis of miscellaneous products.

Table 3-8. 1992-96 Fertilizer Market Forecast by Consumption Areas

		1992							
			Armon 1 um		(Composite) a				
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-20	<u>Total</u>		
			- -		-(t)				
Artibonite	Rice, onions	5,256	431	177	2,167	679	8,711		
Leogane	Maize, industrial tomatoes	162	13	5	67	21	268		
Kenscoff	Vegetables (all kinds)	970	80	33	400	125	1,608		
Foret des Pins	Potatoes, coffee, onions, cabbage	566	46	19	233	73	938		
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	485	40	16	200	63	804		
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	404	33	14	167	52	670		
Cap Haitien	Cane, citrus, onions, other vegetables	243	20	8 —-	100	31 ———	402		
TOTAL		8,086	564	273	3,335	1,045	13,402		

		1993							
			Ammonium	-	(Composite)				
Area	Crop	Urea	Sulfate	20-20-10	12-12-20	14-14-20	Total		
					-(t)				
Artibonite	Rice, onions	5,338	474	149	2,408	697	3,065		
Leogane	Maize, industrial tomatoes	164	15	5	74	21	279		
Kenscoff	Vegetables (all kinds)	985	87	27	445	129	1,674		
Foret des Fins	Potatoes, coffee, onions, cabbage	575	51	16	259	75	976		
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	493	44	14	222	64	837		
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	411	36	1.5	185	54	697		
Cap Haitien	Cane, citrus, onions, other vegetables	246	22	7	111	32	418		
TOTAL		8,212	729	223	3,705	1,072	13,947		

(Continued)

Table 3-8. 1992-96 Fertilizer Market Forecast by Consumption Areas (Continued)

		1994							
Area	Crop	Urea	Ammonium Sulfate	20-20-10	12-12-20 -(t)	(Composite) 14-14-20	Total		
Artibonite	Rice, onions	5,494	481	156	2,591	716	9,438		
Leogane	Maize, industrial tomatoes	169	15	5	80	22	290		
Kenscoff	Vegetables (all kinds)	1.014	89	29	478	132	1,742		
Foret des Pins	Potatoes, coffee, onions, cabbage	592	52	17	279	77	1,016		
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	507	44	14	239	66	871		
Les Cayes	Sugarcame, rice, beans, maire, tobacco, sorghum	423	37	12	199	55	726		
Cap Haitien	Came, citrus, onions, other vegetables	254	22	, —	120	33	436		
TOTAL		8,452	740	240	3,986	1,101	14,520		

					1995		
			Ammonium			(Composite)	
Area	Сгор	Urea	Sulfate	20-20-10	12-12-20	14-14-20	<u>Total</u>
					-(t)		
Artibonite	Rice, onions	5,666	492	167	2,833	827	9,985
Leogane	Maize, industrial tomatoes	174	15	5	87	25	307
Kenscoff	Vegetables (all kinds)	1.046	91	31	523	153	1,843
Foret des Pins	Potatoes, coffee, onions, cabbage	610	53	18	305	89	1,075
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	523	45	15	261	76	922
Les Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	436	38	13	218	64	768
Cap Haitien	Cane, citrus, onions, other vegetables	261	23	8 —	131	38 ———	461
TOTAL		8,717	757	257	4,358	1,272	15,361

		1996							
			Ammonium		(Composite)				
Area	Сгор	Urea	Sulfate	20-20-10	<u>12-12-20</u>	14-14-20	Total		
<u></u>					-(t)				
Artibonite	Rice, onions	5,887	506	181	3,214	867	10,654		
Leogane	Maize, industrial tomatoes	181	16	6	99	27	328		
Kenscoff	Vegetables (all kinds)	1,087	93	33	593	160	1,967		
Foret des Pins	Potatoes, coffee, onions, cabbage	634	54	19	346	93	1,147		
Cul de Sac	Tobacco, industrial tomatoes, other vegetables	543	47	17	297	80	983		
Lus Cayes	Sugarcane, rice, beans, maize, tobacco, sorghum	453	39	14	247	67	820		
Cap Haitien	Cane, citrus, onions, other vegetables	272	23	8	148	40	492		
TOTAL		9,056	778	278	4,945	1,333	16,390		

a. 14-14-20 is composite average nutrient analysis of miscellaneous products.

Table 3-9. Fertilizer Retail Selling Price Buildup by Market Centers as of June 1990

	Po	rt-au-Prin			Kenscoff			Les Cayes	<u> </u>		Artibonite	
Source: Dominican Republic by Truck to:	Urea or 12-12-20	20-20-10	AS Stendard	Urea or 12-12-20	20-20-10	AS _b	Urea or 12-12-20 8)	20-20-10	AS _b	Urea or 12-12-20	20-20-10	AS _b
Total landed cost of product												
(per short ton)	308,11	336,16	235.65	318.89	348.18	245,67	323.23	352,51	250.01	314,66	343,95	241.44
Importer markup (per 100-1b bag)	1.00	1.00	1.00	1.00	1.00	1,00	1.00	1,00	1.00	1,00	1.00	1.00
Importer selling price (per short ton)	328.11	358.16	255.65	338,89	368.18	265.87	343.23	372.51	270.01	334.66	363,95	261.44
(per 100-lb bag)	16.41	17.91	12.78	16,94	18.41	13.28	17,16	16,63	13.50	16.73	18,20	13,07
Dealer merkup (per 100-1b bag)	0,00	0.00	0.00	1.00	1,00	1.00	0.00	0.00	0,00	1.00	1.00	1.00
Dealer selling price (per short ton)	328,11	358.16	255.65	358,89	388,18	285.67	343,23	372.51	270,01	354.88	383.95	281.44
(per 100-1b bag)	16.41	17.91	12.78	17,94	19,41	14.28	17.16	18.63	13,50	17,73	19.20	14.07
Merchant markup (per 100-1b bag)	N.A.	N.A.	N.A.	2.00	2.00	2.00	1.50	1.50	1.50	3,50	3.50	3.50
Small farmer retail price												
(per short ton)	N.A.	N.A.	M.A.	398.89	428.18	325.67	373,23	402.51	300.01	424.66	453.95	351.44
(per 100-1b bag)	N.A.	H.A.	N.A.	19.94	21.41	16.28	18,66	20.13	15,00	21,23	22,70	17.57

by Boat (700 Short Tona)		St. Merc			ort-su-Pri	nce		Kenscoff			Les Cayes			rtibonite	
to St. Marc, Thence	Urea or		AS	Urea or		AS	Urea or		AS,	Urea or		AS	Urea or		AS
by Truck to:	12-12-20	20-20-10	Standard	12-12-20	20-20-10	Standard		20-20-10 (H \$)		12-12-20	20-20-10	<u> (a) </u>	12-12-20	20-20-10	(8)
Total landed cost of															
product (per short ton)	298.42	327.92	224,65	306.54	336.04	232.77	317.40	346.90	243,63	325,21	354.72	251.45	302.48	331.98	228,7
Importer markup															
(per 100-1b bag)	1.00	1.00	1.00	1.00	1.00	1.00	1,00	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.0
Importer selling price															
(per short ton)	318.42	347,92	244.65	326,54	356.04	252.77	337,40	366,90	263.63	345,21	374.72	271,45	322,48	351.98	248.7
(per 100-1b beg)	15.92	17.40	12.23	16.33	17,80	12.64	16.87	18.35	13.18	17,26	18,74	13.57	16.12	17,60	12.4
Deeler markup															
(per 100-lb beg)	1.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1,00	1.00	1,00	1 00	1.00	1.0
Dealer selling price	338.42	367,92	264.85	326.54	356.04	252.77	357.40	386.90	283.63	365,21	394,72	291,45	342.48	371.98	268.7
(per short ton)															
(per 100-1b bag)	16.92	18.40	13,23	15.33	17.80	12,54	17.87	19.35	14.18	18,26	19.74	14,57	17,12	18.60	13.4
Merchant markup															
(per 100-1b bag)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1.50	1.50	1.50	1,50	1.50	1,50	3.50	3.50	3.5
Small farmer retail price															
(per short ton)	N.A.	N.A.	N.A.	N.A.	NA.	N.A.	387.40	415.90	313.63	395,21	424,72	321.45	412.48	441.98	338,7
(per 100-lb bag)	N.A.	N.A.	H.A.	N.A.	N.A.	N.A.	19.37	20.85	15.68	19,76	21.24	16.07	20,62	22.10	16.9

(Continued

Table 3-9. Fertilizer Retail Selling Price Buildup by Market Centers as of June 1990 (Continued)

From Indicated Source (Trinidad or		Marc		u-Prince	Ker	nscoff	Les	Cayes	Arti	ibonite
Venezuela) by Boat (700 t)	Trinidad	Venezuele	Trinided	Venezuela	Trinidad	Venezuela	Trinidad	Venezuela	Trinided	
to St. Marc, Thence by Truck to:	Urea (g)	Urea (p)	Ures (g)							
					(H	\$)				
Total landed cost of product (t)	302.87	252.55	312.12	265.73	319.82	273.42	343.86	297.45	307.90	
(mporter markup (per 50-kg bag)	1.00	3.00	1.00	3.00	1.00	3.00	1.00	1.50		261,51
Importer selling price (per t)	322.87	312,55	332,12	325.73	339.82	333.42	363.86	327.46	1.00 327.90	3.00 321.51
(per 50-kg bag)	16.14	15.63	16.61	16.29	16.99	15.67	18.19	16.37		
Dealer markup (per 50-kg bag)	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	16,40	16,08
Dealer selling price (per t)	342.87	332.55	332,12	325.73	359.82	353.42	363.86	347.46	1,75 362,90	1,00 341.51
(per 50-kg bag)	17,14	16.63	16.61	15.29	17.99	17.67	18.19	17.37	18.15	17.08
Merchant markup (per 50-kg bag)	N.A.	N.A.	٧.٨.	N.A.	1.50	1.50	1.50			
Small farmer retail price (per t)	N.A.	N.A.	N.A.	N.A.	389.82	383.42	393.86	1.50 377.46	3.50	3.50
(per 50-kg bag)	H.A.	N.A.	N.A.	N.A.	19.49	19.17	19.69	18.87	432.90 21.65	411,51 20,58

a. AS refers to ammonium sulfate,

b. (g) refers to granular material.

c. (p) refers to prilled material.

Table 3-10. 1989 Pesticide Market by Product Family

Product Family	Annual Gross Sales Volume, US \$	% of Total Sales
Insecticide	230,000	61
Herbicide	80,000	21
Fungicide	50,000	13
Rodenticide	15,000	5
Total	375,000	100

Table 3-11. 1989 Pesticide Market Share of Importing Companies

Company	Annual Gross Sales Volume, US \$	Market Share (%)
Agrotechnique S.A.	75,000	20
Agri-Supply Co.	23,000	6
Darbouco SA	15,000	4
Compagnie des Tabacs	90.000	24
Famosa	90,000	24
Hasco	30,000	8
SOPRACH	30,000	8
Others	22,000	_6
	375,000	100

Table 3-12. 1989 Pesticide Market by Major Crop

Стор	Annual Gross Sales Volume, US \$	% Share
Tobacco	90,000	24
Tomatoes (industrial)	90,000	24
Rice	30,000	8
Sugarcane	30,000	8
Coffee	11,000	3
Other vegetables	124,000	_33
TOTAL	375,000	100

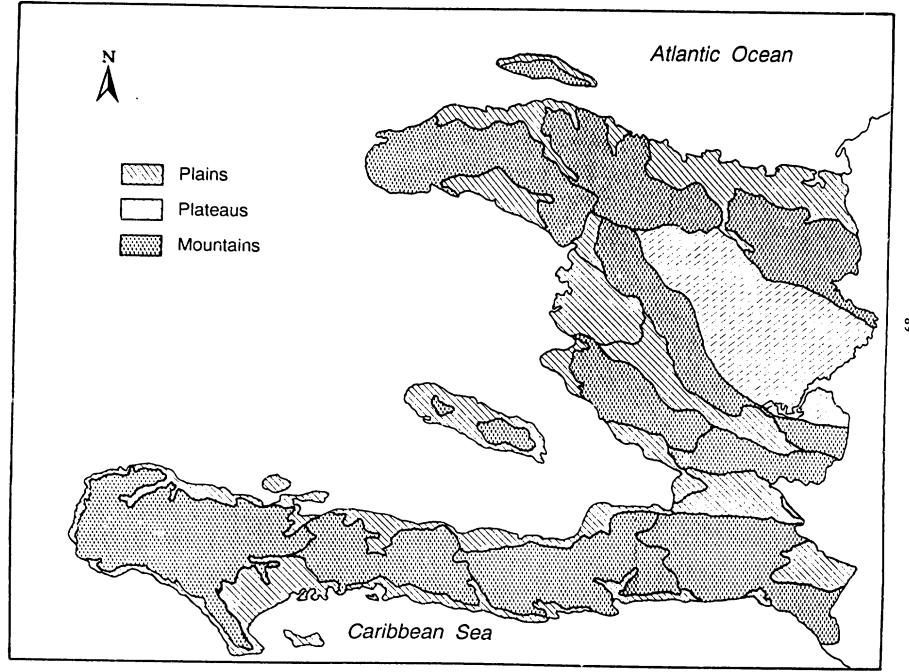


Figure 3-1. Physiographical Regions, Haiti.

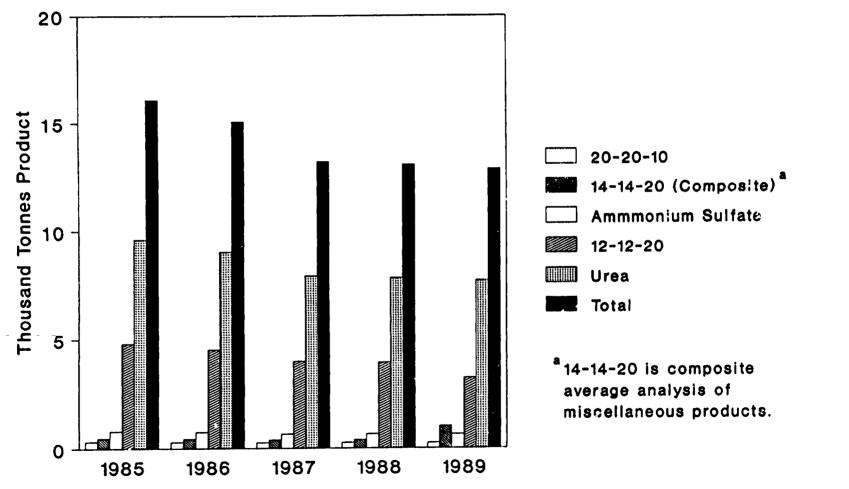


Figure 3-2. Fertilizer Consumption in Haiti, 1985-89.

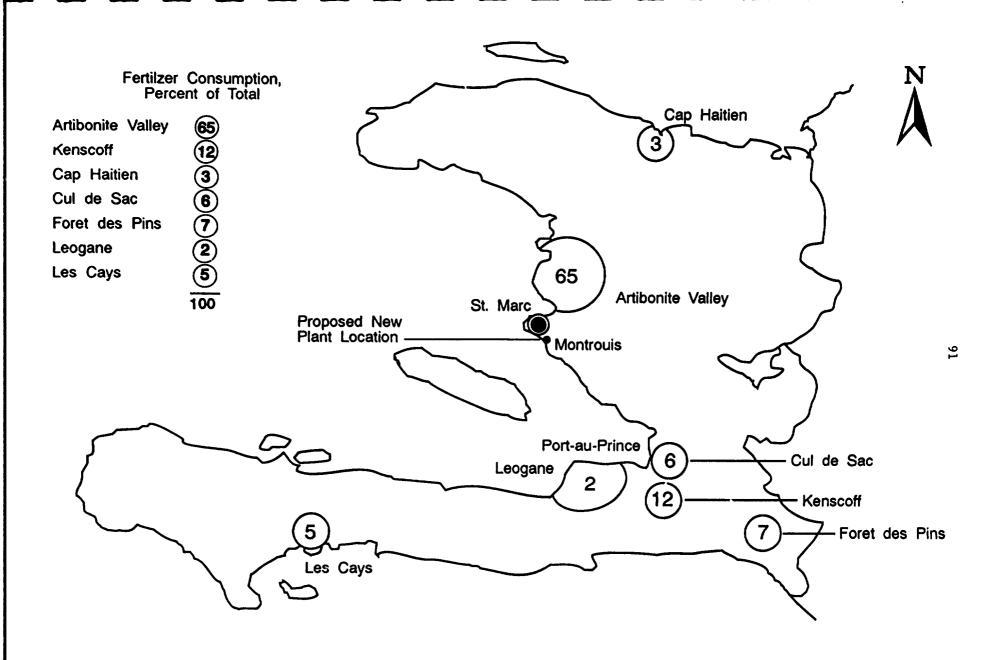


Figure 3-3. Major Fertilizer Consumption Areas (1989).

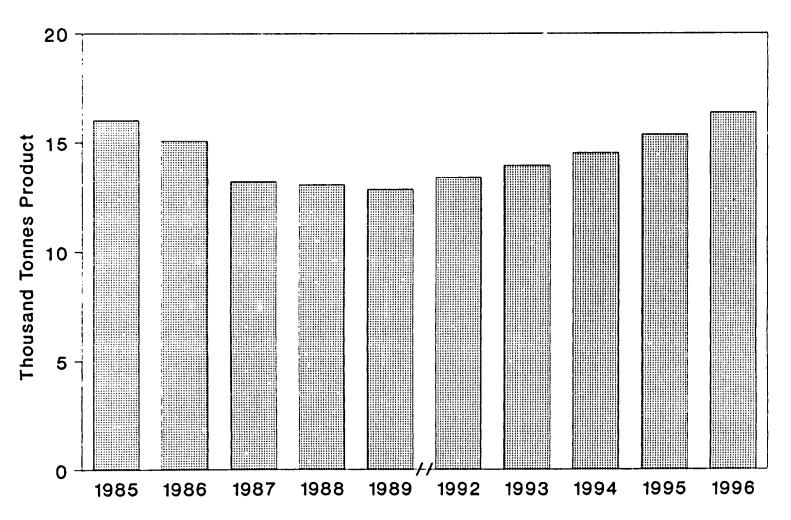


Figure 3-4. Fertilizer Market: Actual for 1985-89; Forecast for 1992-96.

4.0 MATERIALS AND INPUTS

4.1 <u>Definition of Fertilizer Material and Processing Terminology</u>

4.1.1 Fertilizer Material Terminology

In the context of this fertilizer plant project, the terms-materials, raw materials, and products--are used interchangeably depending
upon the context in which they are discussed. For example, urea, a fertilizer
material, is also referred to as a raw material when it is mixed with other
materials to prepare a multinutrient-blended product such as 14-14-14, and
finally, it is called a product when it is simply bagged and sold as a
straight material.

4.1.2 Process Terminology

In this project, fertilizer materials are not processed by transforming them from one chemical or physical state to another as is customary in many sectors of the fertilizer industry. The term processing as used in this project refers to the physical/mechanical handling, mixing (blending), and bagging of various fertilizer materials without altering the physical or chemical state of the individual materials. Fertilizer plants that engage in the physical mixing of two or more materials to obtain a number of nutrient ratics and concentrations are usually referred to as mixers, blenders, or bulk blenders.

4.2 Characteristics of Fertilizer Materials

Fertilizer materials are relatively bulky, typically weighing about 650 to $1,000~{\rm kg/m^3}$ depending upon the particular material. Additionally, most fertilizer materials are quite soluble in water and hygroscopic. Thus, they must be protected from moisture; rain and ground moisture as well as atmospheric humidity.

4.3 Selection of Fertilizer Materials

4.3.1 Required Fertilizer Material Physical Properties

Since the fertilizer materials used in this project will often be used to prepare blends of two or more individual materials to achieve a number of nutrient ratios and grades required by the market, it is important that the particle (granule) size of the individual materials be reasonably uniform to facilitate uniform mixing (blending) and to minimize the risk of separation of the individual materials (segregation) after the product is mixed and bagged.

Uniform mixing and minimum post-production segregation are achieved by selecting materials which have approximately the same granule size and size distribution. The granule-size distribution of common materials used for blending is normally in the range of 1-3 mm or 3-5 mm depending upon origin; materials obtained from Europe tend to be larger in particle size than those obtained from the United States. It is interesting to note that differences in density of the materials have a much less effect on causing segregation than do differences in particle size. Fertilizer materials with the appropriate particle-size characteristics are widely available on the international market. Typical particle-size data for these materials are shown in Table 4-1.

The use of granular materials as opposed to nongranular materials (often referred to as standard-grade materials) is also often preferred when the materials are sold as "straights" without first blending. This is because granular materials are generally quite free-flowing and nondusty thus facilitating handling and application. Many standard-grade products, because of their large surface area, have a tendency to cake and form hard lumps during storage making them more difficult for the farmer to handle and apply. Granular materials, however, are usually more costly than the standard-grade materials (about US \$5/t-US \$40/t more depending upon the material).

Some products, particularly urea, are also available in a prilled form. Prilled urea is smaller in particle size than granular urea. In most cases, the prilled product is more likely to cake than the granular counterpart. Worldwide, only about 15% of the urea is granular; the majority is prilled. On average, prilled urea usually sells for US \$5/t-US \$15/t less than granular urea. Also because of its smaller particle size (usually about 1-2 mm), prilled urea is not well suited for blending because the other

granular materials (for example, phosphate and potash materials) are significantly larger in size.

4.3.2 Fertilizer Material Chemical Properties

The chemical properties (nutrient content and solubility) of the commercially available fertilizer materials used in this project are described in Table 4-2.

4.3.3 Sources of Fertilizer Materials

All fertilizer materials for the project must be imported, therefore, it is essential that all materials specified are widely available on the international market to ensure competitive f.o.b pricing and security of supply. Fortunately, the materials required for this project meet this criterion and can be sourced from the U.S. Gulf Coast, Trinidad, Venezuela, and even Europe and the Far East. Details of the envisioned supply program are more fully described in 4.5.

4.3.4 Other Material Inputs

In addition to the basic fertilizer nutrient materials, the project will require recurring expenses for the following materials and utilities:

- 1. Nonnutrient granular filler material to adjust the nutrient concentration of the blended NPK products to the guaranteed value. This material will be obtained from local sources.
- 2. Finely powdered clay to provide a conditioning agent for the NPK blends and some of the straight materials to minimize caking. This material will be imported in 25-kg bags.
- Empty 50-kg capacity bags, plastic bag liners, wire ties, and stitching thread for packaging the fertilizer products. These materials will be purchased from local sources.
- Diesel fuel for emergency/standby electric power generator and plant mobile equipment. All fuel and lubricants will be obtained from local sources.
- Electric power for operation of all plant facilities and security lighting will be obtained from the public utility service.

4.4. Fertilizer Material Quantities and Costs

4.4.1 Fertilizer Material Quantities

A determination of the quantity of fertilizer materials required for the project was made on the basis of (1) a product slate consisting of three blended NPK products and two straight nitrogen products (urea and ammonium sulfate) and (2) annual projections of market share over a period of 15 years as described in Chapter 3.

The composition (formulation) of the three blended NPK products--20-20-10, 12-12-20, and 14-14-14 is given in Table 4-3. The annual requirements of materials to produce these blends along with the requirements for the two straight nitrogen products--urea and ammonium sulfate--are given in Table 4-4.

4.4.2 Fertilizer Material Cost

Raw materials constitute the majority (about 80%) of the factory-gate production cost.

The cost buildup of the raw materials beginning with the f.o.b. price at the source of supply and ending with the material placed in storage at the project site is given in Tables 4-5 and 4-6.

The cost data in Table 4-5 refers to a simple plant scenario in which the fixed capital investment is minimized and the use of local labor and other domestic resources is maximized. With this scenario, the cost of materials is approximately US \$20/t higher than with an alternative scenario (optimum plant, Table 4-6) requiring a higher fixed capital investment. The higher cost of materials using the simple plant scenario is attributed primarily to the following two major factors:

- A higher ocean freight rate (US \$35/t compared with US \$20/t) due to smaller cargoes and a longer unloading time.
- 2. Increased unloading cost (H \$9.6/t compared with H \$5.7/t) due to increased labor for manual operations.

Even though the simple plant scenario reflects a higher cost for materials, it is evaluated as a possible starting point because the fixed investment for the wharf and bulk storage facilities is minimized, thus decreasing the risk taken by the investors.

As business activity grows and the project obtains increased stability in the marketplace, it may be advisable to expand the plant warehouse storage capacity and improve the wharf facilities to optimize (increase) the cargo size and unloading rate, and thereby decrease the landed cost of materials as shown in Table 4-6.

4.5 Fertilizer Material Supply Program

4.5.1 <u>Critical Supply Constraints</u>

As already indicated, the major recurring cost component for this project is the expenditures required for fertilizer materials, all of which must be imported from off-shore sources. In addition to the c.i.f. cost, other costs directly related to the imported materials accrue; namely, those related to unloading and storage.

Quantity of Raw Materials

The total quantity of fertilizer materials required for the project, especially during the first 5 years, is small by commercial standards. Thus, the costs of procurement (f.o.b. price), ocean transport, and unloading are disproportionately high when compared with larger tonnage operations; for example, procurement and shipment of 10,000-20,000 t cargoes of a single material. Refer to Table 4-4 for annual raw material requirements by type for the projected 15-year project life.

Fixed Capital Investment

Because of the expected relatively low level of sales during the initial years of the project, it is important to minimize the initial investment made in unloading and storage facilities. Thus, it is not feasible to opt toward a large fertilizer material supply program, even though such a system may be more cost-effective when viewed strictly from the material supply side of the project. Instead, a modest system may be more advisable for the early years of operation. Such a system, although more costly in terms of variable cost in the short term, has a very low fixed cost component. A description of such a relatively modest, low investment system follows.

4.5.2 Description of Proposed Initial Supply System

<u>Procurement</u>--The proposed supply system for the initial phase of the project is based on the procurement of relatively small lots of the individual materials that would be assembled into cargoes of up to 2,400-3,000 t, depending upon the density of the materials. The fleet of small ships operating in the region, referred to as minibulkers, would be used. These minibulkers normally have two holds with a capacity of about 1,200-1,500 t each. A hold can be further subdivided to enable the transport of two or more different materials in a single hold.

The need for flexibility offered by the minibulker concept is illustrated by observing the annual fertilizer material requirements for the project during the first 5 years of operation (Table 4-4).

These data (Table 4-4) show that in the first year of operation only one shipload of urea will be needed (about 2,400 t) and the total remaining imported materials (AS, DAP, MOP, and conditioner) will constitute a partial shipload totaling less than 800 t. By the fifth year of operation two shiploads of urea will be needed (about 6,000 t) and the AS, DAP, MOP, and conditioning clay will fill a second minibulker with about 2,500 t.

In actual practice during the first 5 years of operation, it is unlikely that a full cargo (about 2,500 t) of one material would be received at one time. Instead, it is more likely that the supply system will be operated on the basis of partial cargoes of 1,000 t or less scheduled according to annual sales trends and available warehouse space at the plant site. Warehouse space, and thus investment, is deliberately held to a minimum (approximately 3,000-t maximum warehouse space for bulk materials) during the early years of the project. Warehouse space can easily be expanded later as business volume expands. As business expands, a downward trend in the landed cost of raw materials will occur due to lower freight rates and unloading costs resulting from increased mechanization of the unloading operation (refer to 4.5.4).

The Unloading Operation -- As with procurement and storage, the unloading operation in the early years of the project is designed to minimize the initial fixed capital investment required for an unloading wharf and material-handling machinery. Thus, a low level of mechanization is used and the use of manual contract (variable cost) labor is maximized. The simple plant investment cost scenario assumes an offshore unloading scheme described

below. As the project develops a more sophisticated unloading scheme can be developed.

4.5.3. Description of Offshore Unloading Scheme

This method of unloading bulk or bagged cargoes requires a very minimum investment in fixed-cost shoreside facilities, such as a seaworthy wharf, cranes, conveyers, and other material-handling equipment. Instead, the ship is anchored offshore and small boats (lighters or barges) are used to ferry the cargo from the deepwater ship anchorage to shore. The shore facilities are quite minimum (often temporary) to facilitate offloading of the cargo from the small boats to the shore where it is trucked or manually transported to storage. This method of unloading is widely used along the East Coast of India where large ships (20,000-t cargoes or more) anchor up to 5 km from shore and routinely discharge into 10-t capacity lighters that transfer the bulk cargo (after first temporarily bagging in the ship's hold) to shore. A similar system was observed in Haiti (St. Marc) where bagged cement was unloaded into small boats for transfer to shore.

In the system envisioned for the initial stage of this project, the bulk cargo would be "temporarily bagged" in the hold of the ship to facilitate transfer to shore. The bags would be manually filled and hand or machine stitched in the ship's hold and loaded into rope slings for transfer, using the ship's gear, from the ship's hold to the waiting small boats. A typical sling load would contain about 1 t (about twenty 50-kg bags). Based on experience in India, a 1- to 1.5-t sling can be transferred from the ship's hold to the small boat every 4 minutes. Assuming two gears working two holds, this would amount to a discharge rate of at least 30 tph or 720 tpd (24-h operation). However, for the purpose of the Haiti operation, an unloading rate of 500 tpd is assumed (Table 4-7).

The lighters, carrying anywhere from 2 t to 5 t, would travel to shore (about 100-200 m) and tie to the plant's shallow draft wharf for unloading. Depending upon the relationship of the level of the sea to the level of the wharf, unloading would be accomplished either by single-cable crane lift or by manual unloading using a gangplank. In either case, the bags would be loaded onto company-owned or leased trucks for transfer to the plant warehouse located about 500 m from the wharf.

At the warehouse the bags are opened and dumped into the mechanical inloading system for the warehouse. If the bags are machine-stitched, a nonlock stitch is used to facilitate easy opening. The bags are recycled back to the ship for reuse. The mechanical inloading system is used to maximize the pile depth, and therefore the capacity of the warehouse. Also, the mechanical inloading system, consisting of a bucket elevator and conveyor belt system, gently handles (compared with using front-end loaders to form piles of material) the granular materials thus minimizing breakdown of the granules which will cause dust, segregation, and caking during subsequent storage and processing.

4.5.4 Cost of Offshore Unloading Operation

The cost of the offshore unloading operation is estimated at H \$5.5/t (Table 4-7). This compares with H \$1.5/t (Table 4-6) for a more mechanized operation in which the ship is tied to a shoreside wharf and the materials are transferred in bulk, using the ship's gear and the company's clamshells, directly from the ship to the transfer trucks parked on the wharf.

As the project develops and the size and scope of the operation increases, it may be justified to invest in a permanent seaworthy wharf facility designed for more efficient and cost-effective bulk unloading. However, the initial scope of the project does not appear to justify such an initial investment.

4.6 Other Inputs

4.6.1 Electric Power

The project will require a maximum demand of about 100 kW based on 1.5 times the connected load of about 70 kW. The indicated demand (100 kW) will allow for the future expansion of the warehouse and the gradual replacement of manual operations with mechanized operations.

Electric power for the project will be obtained from the local public utility. Provisions have been made in the investment estimates to bring the public utility supply to the factory site. The cost of power from the public utility is estimated at H \$0.20/kWh.

In addition to the public utility supply, the project is equipped with an emergency 75-kW diesel-powered electric power generator. This generator will be used to power the facility when the public utility supply is interrupted. The project cost calculations assume that public utility power interruptions will occur on an average of 2 h/day.

4.6.2 Water Supply

Since selection of the project site has not been finalized, the water supply source is uncertain. The plant process operations require essentially no water. However, a significant amount of water will be needed for the worker's bathing facilities and for drinking. For the purpose of the project estimates, it is assumed that all water for bathing and drinking will be collected from rain and stored in a cistern located on the factory site. Treatment facilities will be provided to ensure that the water is safe for human consumption.

4.6.3 Other Materials and Supplies

Empty 50-kg capacity woven polypropylene fertilizer bags, plastic bag liners, bag stitching (closing) thread, and diesel fuel will be purchased from local sources. The unit costs of these inputs are shown in Table 4-8. Miscellaneous operating supplies such as lubricants and employee safety equipment are factored into the respective production cost components.

Table 4-1. Typical Particle-Size Data for Commercially Available Fertilizer Materials

Material	(3.35 m) +6	(2.36 mm) +8	+14	+20	(0.50 mm) +32 med on indic	(0.36 mm) +42 ated mesh)	(0.30 m) +48	+100	PAN
Granular urea	2	78	98	98					100
Granular diammonium phosphate (DAP)	2	50	88	98					100
Gramular muriate of potash (MOP)	7	45	96	98					100
Granular assonium sulfate	6	20	72	96					100
Standard associum sulfate Filler ^b Conditioning agent ^C				2	18	73	92	99	100

a. Tyler mesh series

b. Purchased locally and screened to match particle size of other granular materials.

c. Kaolin clay with typical particle size of 90% minus 10 μm .

Table 4-2. Typical Chemical Properties (Nutrient Content) of Commercially Available Fertilizer Materials

Material	_	<u>Total</u>	Water-Soluble		<u>K20</u>	<u>s</u>	H2O
		• • •	((1)			
Urea	46	-	-	-	_	_	0.2
Ammonium sulfate	21	•	-	•	-	24	0.5
Diammonium phosphate (DAP)	18	46.2	40-41	46.0	-	-	1.5
Muriate of potash (MOP)	-	-	-	-	60	-	0.1

a. Water-soluble plus neutral ammonium citrate-soluble P2Ds per Association of Official Analytical Chemists (AOAC) methods.

Table 4-4. Annual Fertilizer Raw Material Requirements for 15-Year Project Life

	Annual Raw Material Requirements a														
Rew Material	1992	1993	1994	1995	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Urea	2,383	3,656	4,536	5,719	6,020	6,514	7,035	7,548	8,039	8,481	8,863	9,173	9,411	9,590	9,754
Standard ammonium															
sulfate	50	106	136	172	186	201	217	233	248	262	274	283	290	297	302
Diammonium phosphate															
(DAP)	317	515	678	907	1,028	1,112	1,201	1,288	1,372	1,447	1,513	1,566	1,607	1,637	1,665
Muriete of potesh (MOP)	345	574	760	1.009	1,152	1,246	1,346	1.445	1,538	1,623	1,696	1,755	1.801	1,835	1,867
Filler	229	380	502	673	765	828	694	959	1,022	1,078	1,126	1,166	1,196	1,219	1,240
Conditioning agent									·	•	•	·	•	·	•
(bagged)	45	<u>74</u>	98	130	148	160	173	186	198	209	218	226	231	236	240
TOTAL	3,369	5,305	6,810	8,610	9,299	10,061	10,866	11,660	12,417	13,100	13,690	14,159	14,536	14,814	15,068

a. Indicated quantities include allowance for an overall shrinkage (loss) of 3.0%.

b. All materials are granular except ammonium sulfate and conditioning agent (clay).

Table 4-5. Rew Meteriel Cost Buildup for Offshore Unloading Scheme (Simple Plant Scenerio)

		461 N	Ammor Sulfate 211 N- US \$	(AS),	Sulfa Standa	onium te (AS) rd Grade, N-241 S E 3					Muria Potash 60%	(MOP),	Condit Clay (b US 8			ler hesed) miti) H 8
c.i.f. cost																
f.o.b. Ocean freight	130.0	0	95.0	0	55.0	0	195.0	0	190.0	0	110.0	0	80.0	0	0	0
Insurance (0.5% f.o.b.)	35.0 0.7		35.0 <u>0,5</u>	0	35.0 	<u> </u>	35.0 1.0	0	35.0 1.0	0	35.0 0.6		40.0 <u>0.4</u>	<u> </u>	_0	
Subtotel c.i.f.	165.7	0	130.5	0	90.3	0	231.0	0	226.0	0	145.6	0	120.4	0	0	0
Premium for small lots																
(5% of c.1.f.) ^c	8.3	_0_	6,5		4,5	0	11.6		11.3		<u>7.3</u>		6.0		_0	_0_
Subtotal	174.0	0	137.0	0	94.8	0	242.6	0	237.3	0	152.9	0	126.4	0	0	0
Port and unloading charges																
Wharfage	0	3,0	0	3.0	0	3.0	0	3.0	0	3.0	0	3.0	0	3.0	0	0
Customs inspection	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0
Stevedoring	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	0
Unloading labor, supervising and assistance	• —	5.5	•	5.5	• ——	5.5	°	5.5	0	5.5	· —	5,5	0	3.0	-	°
Subtotal	0	9.6	0	9,6	0	9.6	0	9.6	0	9.6	0	9.6	0	7.1	0	0
Administrative/tax charges																
Letter of credit opening and closing (1.5% of c.i.f.)	0	2.6	0	2.1	0	1.4	0	3.6	0	3.6	0	2.3	0	1.9	0	0
Bank acceptance of letter of credit (1.5% of	2.6	0	2.1	0	1.4	0	3.6	0	3.6	0	2.3	0	1.9	0	0	0
c.i.f.) Consul tax (3% of f.o.b.)	0	3.9	0	2.9	0	1,7	0	5.9	0	5.7	0	3.3	0	2,4	0	0
Subtotal	2.6	6.5	2.1	5.0	1.4	3.1	3.6	9.5	3.6	9.3	2.3	5.6	1.0	4.3	-	0
TOTAL (material in storage)	176.6	16.1	139.1	14.6	96,2	12.7	245.2	19.1	240.9	18.9	155.2	15.2	128.3	11.4	0	20.0

a. All materials are shipped in bulk (except clay) and are granular suitable for blending except standard grade AS which is sold as a nongranular straight material. All costs refer to 1.0 t of material.

b. Average value assuming minibulker rates and raw material sourcing from Trinidad and the U.S. Gulf region.

c. Estimated by IFDC assuming extra costs that usually occur when procuring small/mixed product shipments.

d. Includes hired equipment and short-term contract labor involved in offshore unloading operation. Refer to Table 4-7 for details,

Table 4-6. Raw Material Cost Buildup for Conventional Bulk Unloading Scheme (Optimum Plant Scenario)

	Uree. US 3	46X N H 3	Ammon Sulfate 21% N- US \$	(AS),	Sulfat Standar	onium Le (AS) rd Grade, H-241 S			Diamme Phosphat 181 N-	te (DAP),	Muria Potash 60% 1 US \$	(MOP),	Condit Clay (b US 8		7111 (purch	ased)
c.i.f. cost f.o.b. Ocean freight Insurance (0.5% f.o.b.)	130.0 20.0 0.7	0	95.0 20.0 0.5	0	55.0 20.0 0.3	0 0 <u>0</u>	195.0 20.0 1.0	0 0 _0	190.0 20.0 1.0	0 0 0	110.0 20.0 0.5	0 0	80.0 40.0 0.4	0 0 0	0 0 0	0 0 <u>0</u>
Subtotal c.i.f.	150.7	0	115.5	0	75.3	0	216.0	0	211.0	0	130.6	0	120.4	0	0	0
Premium for small lots (5% of c.i.f.)	7.5		5,8	0	3.6	_0	10.8	0	10.6	0	_6.5		_6,0	0	_0	_0
Subtotal	158.2	0	121.3	0	79.1	0	226.8	0	221.6	0	137.1	0	126,4	0	0	0
Port and unloading charges Wharfage Customs inspection Stevedoring Unloading supervision and assistance Miscellaneous equipment and services	0	3.0 0.1 1.0 0.1	0 0 0	3.0 0.1 1.0 0.1	0	3.0 0.1 1.0 0.1	0	3.0 0.1 1.0 0.1	0	3.0 0.1 1.0 0.1 1.5	0 0 0 0	3.0 0.1 1.0 0.1	0 0 0	3.0 0.1 1.0 0.1	0 0 0 0	0 0 0
Subtotal	0	5.7	0	5,7	0	5.7	0	5.7	0	5.7	0	5.7	0	5.7	0	0
Administrative/tax charges Letter of credit opening and closing (1.5% of c.i.f.)	0	2.4	0	1.8	0	1.2	0	3.4	0	3.3	0	2.1	0	1.9	o	0
Bank acceptance of letter of credit (1.5% of c.i.f.)	2.4	0	1.8	0	1.2	0	3.4	0	3.3	0	2.1	0	1.9	0	0	0
Consul tax (31 of f.o.b.)	0	3.9	0	2.9	0	1.7	0	5.9	0	5.7	0	3.3	0	2.4	0	0
Subtotal	2.4	6.3	1.8	4.7	1.2	2.9	3.4	9.3	3.3	9.0	2.1	5,4	1.9	4.3	•	0
TOTAL (material in storage)	160.6	12.0	123.1	10.4	80.3	8.6	230.2	15.0	224.9	14.7	139.2	11.1	128.3	10.0	0	20.0

a. All materials are shipped in bulk (except clay) and are granular suitable for blending except standard grade AS which is sold as a nongranular straight material. All costs refer to 1.0 t of material.

b. Average value assuming liner rates and raw material sourcing from Trinidad and U.S. Gulf region.

c. Estimated by IFDC resuming extra costs that usually occur when procuring small/mixed product shipments.

d. Includes hired trucks and equipment and short-term contract labor.

Table 4-7. Offshore Fertilizer Material Unloading Data

Vessel and Discharge Data

Cargo size: 2,400-3,000 t assuming minibulker-type ship.

Number of holds: 2 at 1,200-1,500 t each.

Distance between vessel anchorage and shore: 100 m or less.

Ship's gear lifting cycle time: 5 minutes/gear (ship's hold to small boat and return).

Capacity of single lift using rope-type cargo sling: 1.0 t.

Number of lifts per hour: 12/hold; 24 total.

Actual discharge rate: 24 tph; 576 tpd (assume 500 tpd for cost estimating).

Small Boat (Lighter) Data

Average capacity: 5 t.

Loading, unloading, and towing time: 60 minutes/round trip (5 tph).

Number of boats required: six.

Manning Requirements

	Number/Hol	d and Total	Total						
In Ship's Hold (Two Holds)									
Foreman	1	2							
Bag holders	8	16							
Bag fillers	8	16							
Bag closers	2	4							
Cargo sling tenders	2	4							
Subtotal	-	42	42						
	Number/Ros	t and Taxal							
	Munber/Boa	t and Total							
Aboard Small Boats (Six Boats)									
Bag handlers	4	27.							
Subtotal	7	$\frac{24}{24}$	24						
On Shore									
Foreman	1								
Bag handlers	15								
Bag dumpers	5								
Talley clerks	4								
Subtotal	25		<u>25</u>						
TOTAL			91						
(Continued)									

Tah'e 4-7. Offshore Fertilizer Material Unloading Data (Continued)

Estimated Cost

			Cost
		Unit Cost	Total Cost Per
	Number	Per Hour	24-h Day
			- (H \$)
Manning Position			
Foremen	3	2.0	144
Talley clerks	4	1.5	144
Labor			
Ship's hold	40	0.8	768
Small boats	24	0.6	346
On shore	20	0.6	288
Subtotal (labor)			1,690
Small Boat Rent			
(H \$100/24-h day x	6 boats = H \$600/day))	600
Subtotal (contract	services)		600
TOTAL (24 h period)			2,290

H \$2,290/24 hours is equivalent to H \$4.58/t assuming 500-tpd (24 h) unloading rate.

Use value of H \$5.5/t to cover any other costs that may be incurred (refer to Table 4-5 for total port and unloading charge of H \$9.6/t).

Table 4-8. <u>Unit Cost of Empty Fertilizer Bags</u>. <u>Fuel</u>, and <u>Electricity</u>

Item	Cost (H \$)
50-kg net capacity empty bags including stitching thread and wire ties for closing*	0.85/each
Diesel fuel	0.45/L
Electricity ^b	0.20/kWh

a. Open-mouth woven polypropylene outer bag with polyethylene inner liner (obtained from local source).

b. Purchased from local public utility. Cost of emergency/standby electricity produced by diesel-driven 75 kW generator is included in fertilizer production cost.

5.0 LOCATION AND SITE

5.1 General Location Criteria

The location of the proposed fertilizer plant is critical to the success of the project. The essential location criteria include:

- Direct access to deep and calm water (about 8 m) to facilitate receipt of all imported raw materials by ship. A minimum water depth of 8 m is preferred to accommodate receipt of 10,000-dwt ships that may discharge only a portion of their cargo.
- 2. Close proximity to the major agricultural areas, particularly the Artibonite Valley, to minimize land transport of fertilizer products and thereby maintain a competitive delivered cost structure.
- 3. Close proximity to the national highway system to facilitate land transport and physical distribution of fertilizer products.
- 4. Close proximity to one or more population centers (cities) to benefit from developed infrastructure that is normally associated with population centers; for example, electric power, water, machinery repair shops, an abundant labor force, and other essential contract services.

5.2 <u>Site Alternatives</u>

According to these general location criteria, three potential sites were considered. A brief description of each follows (refer to Figure 5-1 for location).

5.2.1 St. Marc (Freycineau)

This is the site selected for the relocation and expansion of the ASSA fertilizer blending plant described in Chapter 2. This site, under lease by ASSA until 1986, was thoroughly evaluated in 1985 as it was the subject of the previously mentioned Hatch Study. The site meets all the criteria indicated above. However, the cost of installing a wharf for unloading of bulk fertilizer materials was estimated at about US \$500,000 in the Hatch Study. This cost could probably be decreased significantly by using local

H \$20,000. Of course, a larger cost would be required to develop the wharf for direct unloading of bulk cargoes.

It is assumed that a sublease arrangement could be negotiated with the primary leaseholder. A subletting fee of H \$500/month is assumed for this evaluation, but this must be confirmed.

Since the site is already quite well developed, it is securely fenced and public electric power is available. A cost of H \$20,000 is estimated for bringing the power to the battery limits of the proposed fertilizer plant. Likewise, a total of about H \$46,000 is estimated to be required for clearing and leveling of the site (including installation of surface drainage facilities), upgrading of access roads, and paving of the plant yard area with crushed stone.

If potable water is available it will be used. However, provisions are made in the estimate for collecting and treating rainwater to ensure an adequate supply for the workers' washing and drinking needs. Refer to Table 5-1 for a summary of the estimated cost of land and site preparation.

5.4 Environmental Impact

Aside from increased human activity and the truck transport of fertilizer products from the site, the proposed factory is expected to have little adverse impact upon the existing environment. In fact, with responsible management, the esthetics of the site will be enhanced through the improvement of the access road, drainage, and appearance of the grounds.

Fertilizer materials are quite soluble and often dusty. Therefore, the facility will be designed to minimize airborne dust or spillage of materials that may be washed into the sea or other waterways. All material-handling systems will be designed to avoid the creation of airborne dust and spillage.

Furthermore, the work force will be equipped with dust masks, gloves, boots, and other protective clothing when working in areas where it is impossible to avoid prolonged direct contact with the fertilizer materials and dust.

Table 5-1. Estimated Cost for Land and Site Preparation

Item	US \$	ost H \$
Clearing and leveling of site including surface drainage structures	0	25,000
Crushed stone paving of plant yard area (approximately 12,000 m ²) ^b	0	11,000
Improvement of access road between plant site and national highway (approximately 0.8 km)	0	5,000
Install crushed stone-paved access road between plant raw material warehouse and material unloading wharf (approximately 0.5 km)	o	5,000
Route public electric power supply to plant site	_0	20,000
TOTAL	o	66,000

a. Land is leased at H \$6,000/year.
 b. Delivered cost of crushed limestone estimated at H \$7.0/m³.

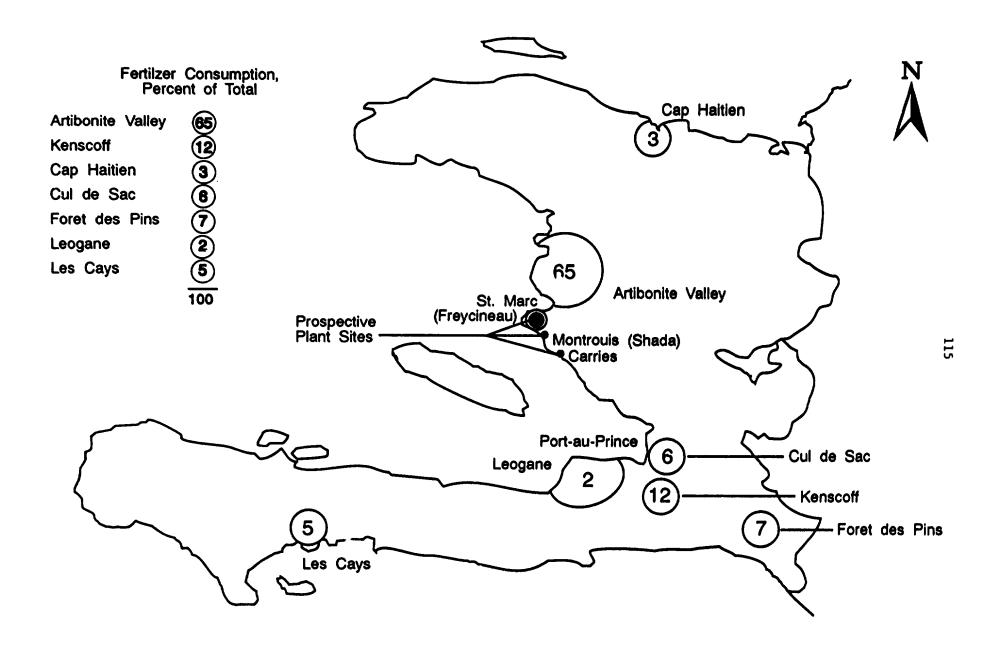


Figure 5-1. Location of Prospective Fertilizer Plant Sites With Respect to Major Fertilizer Consumption Areas.

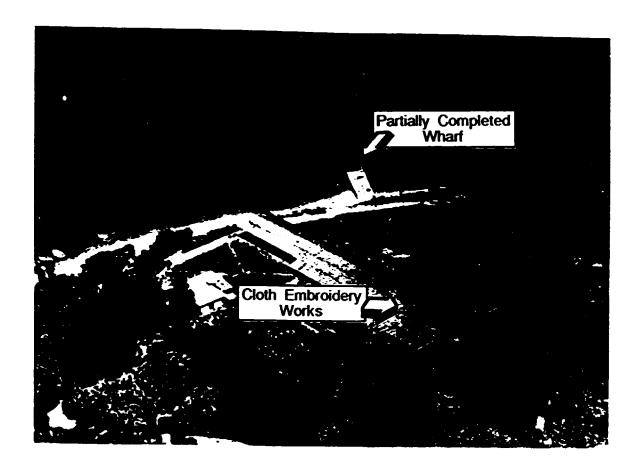


Figure 5-2. Aerial View of Shada Site at Montrouis.

6.0 PROJECT ENGINEERING

6.1 General Layout

The proposed fertilizer project is basically one of solid material handling, mixing, and bagging using 50-kg plastic-lined open-mouth bags. A simplified flow diagram of the overall process is shown in Figure 6-1. The major elements of the process consist of:

- Unloading of imported fertilizer materials from ocean-going ships which may be moored to an offshore anchorage or shoreside wharf.
- Inloading of the fertilizer materials into a bulk storage warehouse fitted with partitions to prevent cross mixing of the different materials.
- 3. Reclaiming of bulk materials from storage and either weighing and mixing them to achieve the desired grade/nutrient ratio (the blending process) or simply bagging straight materials. In all cases, all blended or straight materials will be bagged before dispatch.

6.2 <u>Definition of Blending Terminology</u>

The terms "blending" or "bulk blending" as used in this study refer to the physical mixing of a number of dry fertilizer materials to obtain a desired nutrient ratio and concentration. In most cases, the fertilizer raw materials used for bulk blending should be in a granular form (usually between about 1-3 mm in particle size). However, in some markets mixtures of powdered and granular or semigranular materials are often used. For example, in Malaysia about 0.5 million t of powdered or semigranular NPK blends are used annually to fertilize rubber and oil palm.

The particle size of materials used to prepare acceptable blends is largely dependent upon local cropping conditions and farmer preferences. For example, if fertilizing short-term, heavy-feeding crops, a well-mixed, homogeneous blend is preferred to ensure an abundant supply of nutrients in the correct proportion during a relatively short growing season. Such blends are usually prepared by using granular raw materials that are closely matched with respect to particle size. This close matching minimizes segregation of

the individual materials during handling, transportation, and field application. However, with some tree crops (for example, rubber and oil palm) and other long-term crops such as sugarcane, the uniformity of the mixture is not so critical, and the use of less homogeneous mixtures prepared from less expensive, and even less soluble, materials (reactive phosphate rock, for example) may be feasible. However, for the Haitian conditions, high-quality, soluble granular raw materials are assumed and such materials will be considered as the primary alternative for the purpose of this study. As the project develops and fertilizer requirements are more clearly understood, it may be entirely feasible to produce a line of nongranular and less soluble blends (also less costly) for certain segments of the market.

6.3 <u>Description of Blending Process and Equipment</u>

Process flow diagrams of the two blending plant configurations evaluated for this project are shown in Figure 6-2 and Figure 6-3.

In the blending process, raw materials are reclaimed from bulk storage using a motor-driven, front-end loader. The material is dumped into a lump breaker. This unit is used to crush lumps that normally form during storage. This type of lump formation is usually referred to as "pile set" (a mechanical bonding of granular materials); however, some lumps may also form due to "crusting" of the pile surface as a result of absorption of atmospheric moisture. The lump breaker is designed to gently crush lumpy material while inflicting only a minimum amount of damage to the granules.

With the optimum plant design, the material from the lump breaker is transferred by a bucket elevator to a multicompartment hopper system (cluster hopper). The bucket elevator is fitted with a steel link-type chain and metal buckets. The speed of the chain and the size and configuration of the buckets are designed to minimize degradation of the material. The capacity of the bucket elevator is much greater than the average capacity of the blending unit since it is usually fed on an intermittent basis and must therefore be designed to accommodate short-term surges. With the simple plant design, the elevated cluster hopper system is not used and the front-end loader dumps the material directly into a ground-mounted weigh hopper as shown in Figure 6-3.

The raw material proportioning (weighing) and mixing steps are performed on a batch basis. Manually operated discharge gates on the cluster hopper are used to sequentially discharge the various raw materials into a weigh hopper located below the cluster hopper unit. After the total batch is weighed, the batch of materials is discharged into a mixer. The mixer is fitted with internal mixing baffles or paddles and a discharge chute assembly. The mixer has a normal working capacity of 2-5 mt depending upon its design. After an appropriate period of mixing (usually 2-4 minutes), the material is discharged and conveyed to one of three manual bagging hoppers. Micronutrients, coloring agents, and a conditioning agent (to minimize caking) can also be added during the mixing step.

If only bagging is required, the reclaimed material is fed to the lump breaker as previously described but the batch weighing and mixing equipment is bypassed and the material is fed directly to the manual bagging hoppers. If a conditioning agent must be added to a straight material to minimize caking, this can be done by routing the material through the batch weighing and mixing system as with conventional blending.

6.4 Description of Bagging System

For this study, manual bagging is assumed. The manual bagging system consists of three portable bagging hoppers that are filled by positioning a swivel spout over the appropriate hopper. The hoppers may also be filled directly using the front-end loader. The hoppers are equipped with internal baffle assemblies designed to minimize segregation of the blended material. Portable platform scales are located beneath each hopper and the operator fills plastic-lined, open mouth-type 50-kg bags by operating a manual discharge gate (filling spout) while observing the platform scale beam balance indicator. The filled bags are closed by first tying the plastic liner with a rubber band or plastic-coated wire tie. The outer bag (jacket), usually made of woven polypropylene, is stitched closed using a hand-held electric sewing machine. This type of bagging is very accurate and widely used in many developing countries and is an effective alternative to mechanical bagging. One manual bagging station, as described above, served by five workers (bag filler, offbearer and plastic liner closer, sewer, and two helpers) can

routinely bag and palletize at a rate of about 5 tph (100 50-kg bags). A photograph of a typical manual bagging operation is shown in Figure 6-4.

An alternative to manual bagging is a mechanical bagging operation. The main difference between manual and mechanical bagging is that with mechanical bagging the weighing operation is performed with an automatic weighing unit (mechanical or electronic) instead of the previously described manually operated filling spout and platform scale system. Although mechanical bagging units are reported by the manufacturers of such equipment to operate at rates of about 50 mtph (1,000 50-kg bags/h), in practice an average rate of about 25 mtph (500 50-kg bags/h) is more realistic. When a woven outer bag and a plastic inner bag are used, proper sealing of the two bags limits the capacity of any type of bagging operation. The net result is that either system (manual or mechanical) requires about the same labor per tonne of product. The mechanical system may appear to be more cost effective, but in fact, it is usually more costly in developing countries because of the larger investment and the higher level of maintenance that is required.

6.5 Blending and Bagging Plant Capacity

6.5.1 Blending Plant Capacity

The proposed blending plant, using a 4-t batch-type mixer, will have a nominal capacity of about 12 tph (about 144 tpd assuming 12 h of actual operation/day). This translates to an annual maximum capacity of 28,800 t assuming 200 12-h workdays. The actual capacity that can be obtained is largely related to the number of raw materials in the blend. A blend containing only two materials can be prepared at a faster rate than a blend containing more materials. The mixing time for each blend is about the same regardless of the number of materials. However, the time required to weigh four materials, for example, is obviously more than what is required to weigh only two materials. For the purpose of this study, a capacity of about 15,000 tpy is assumed for a single shift operation (6 h/day net) assuming 200 days/year. This corresponds to approximately 30% of the projected demand for blended fertilizers by the year 2000.

It is important to note that there is little advantage for constructing a smaller capacity blending unit than envisioned for this study as the fixed capital investment for the machinery varies only slightly over

the capacity range of 10-20 tph. Therefore, a standard 4-t batch (12 tph) unit is recommended.

6.5.2 Bagging Plant Capacity

Three manual bagging lines are proposed. Each bagging line will have a capacity of about 5 tph for a total bagging capacity of 15 tph. This matches the instantaneous hourly capacity of the blending unit. As previously mentioned, the bagging rate for a single manual bagging line is usually limited to about 5 tph (100 50-kg bags) because of the time required to properly seal the plastic inner liner and then stitch (sew) the outer bag (jacket).

6.5.3 Bagged Product Storage

For the most part, the fertilizer products will be blended, bagged, and dispatched on an as-ordered basis. Therefore, only a minimum of bagged product storage at the plant site is assumed. A secure bagged product storage area inside the warehouse of 100 t capacity is assumed. The small allocation of storage space for bagged product (blends and straight materials) is preferred to ensure that the products remain fresh and free flowing.

6.6 Machinery and Equipment Cost Estimates

The estimated cost of machinery, equipment (including engineering and installation), and related construction services is itemized in Table 6-1. The scenario referred to as the "simple plant" is indicated as the most likely program for the initial phase of this project. The estimated cost for a more mechanized system referred to as the "optimum plant" is also shown. It is envisioned that, as the project's financial status permits, additional investments may be justified to gradually move from the simple, more labor-intensive mode of operation to a more mechanized mode of operation. The comparative investment criteria for buildings and civil works are also described for the simple and optimum plant scenarios in Section 6.7.

6.7 Civil Engineering Works

In addition to land and site preparation described in Chapter 5, the following major civil works will be required:

- 1. Rehabilitation and expansion of existing wharf to facilitate unloading of fertilizer raw materials.
- Construction of a raw material storage building including an area for the process plant (blending and bagging machinery and equipment) and bagged product storage.
- Construction of a maintenance workshop with space allocated for storage of machinery and equipment and special products (agricultural chemicals and implements).
- 4. Construction of an office and showroom complete with an underground cistern for collection and storage of potable water.
- 5. Installation of plant yard and security lighting.

The most significant civil works cost item is for bulk material storage. In the simple plant scenario, a total bulk product storage area of 1,200 m² is assumed in addition to the space (about 300 m²) required for the blending and bagging system and for bagged product storage and truck loading. The 1,200 m² area dedicated for bulk storage, less 30% to allow for a material reclaiming work aisle, is sufficient to store approximately 3,000 t of material provided divider partitions are used and care is taken to fill the individual bins to capacity. Likewise, with the optimum plant scenario, the 2,000 m² bulk material storage area (2,300 m² total) will be sufficient to store about 5,000 t of bulk material. The storage building will be designed to facilitate future expansion by adding to its length and by extending the length of the inloading (shuttle) conveyor located above the various material bins (refer to 6.7.1).

6.7.1 Building Design Features

<u>Bulk Material Storage Building</u>--As already mentioned, this is the most costly component of the entire project. It is especially costly in Haiti because of the general lack of building materials customarily used in fertilizer plant projects--wood, concrete, and steel.

Usually the most cost-effective building configuration for storage of bulk fertilizer materials is the A-frame design. The A-frame design (angle of roof line resembles the letter "A") takes into consideration the natural

angle of repose of the fertilizer materials and avoids the need for heavily reinforced, and expensive, outer retaining walls or bulkheads to contain the material—the fertilizer material simply forms a free-standing pile. A steel—reinforced concrete floor is recommended to facilitate the reclaiming of materials from the bins, control surface moisture, minimize losses of material, and generally improve housekeeping.

The A-frame structure is equipped with a movable conveyor belt (shuttle conveyor) located near the roof apex; the shuttle conveyor is fed by an inloading conveyor or bucket elevator. The shuttle conveyor is mounted on wheels that roll on a track assembly. It is positioned as needed, using a manual winch, to discharge the fertilizer material into the appropriate bin. The A-frame building is an open structure and movable bin dividers are used to separate the various materials. The dividers can be constructed of stacked wood planks in a bookshelf-type configuration or they can be made of concrete. The solid concrete units, while minimizing cross contamination of materials, are more cumbersome to use as they require heavy-duty lifting equipment to move from one location to another.

A lean-to-type shed with enclosed sidewalls is fitted along the length of one side of the A-frame structure. This lean-to structure provides a covered work aisle for operation of the front-end loader that is used to reclaim materials from the respective bins and haul them to the blending and bagging unit. The entire building can be easily sealed to minimize the influx of humid outside air. Normal solar heating will help to decrease the relative humidity of the inside air, thus helping to minimize absorption of atmospheric moisture by the fertilizer materials.

6.7.2 Blending and Bagging Plant Building

The envisioned blending and bagging facility is located within an enclosed structure (process plant building) that is essentially an extension of the A-frame bulk material warehouse facility. The structural steel required to support the blending machinery also serves as the major framing and structural support for this portion of the building.

Except for the possible need for a concrete pit (about 3-m deep) for the raw material lump breaker and bucket elevator systems, all equipment is located at or above ground level. The pit is preferred to facilitate easy charging of material into the lump breaker using a payloader, dump carts, wheelbarrows, or hand-hauled bags.

The exact location of the process plant building with respect to the bulk material storage bins in the A-frame building is uncertain. However, depending upon the location it may be necessary to penetrate a portion of the A-frame building roof to enclose the bucket elevator and raw material cluster hopper system required for the blending and bagging plant. If the simple plant blending system is used (Figure 6-3), the building modifications required for installation of the machinery will be simplified because the overhead cluster hopper system is not used.

6.7.3 Other Buildings

Other buildings, including the maintenance workshop, office/
showroom, and miscellaneous storage buildings, will be constructed to conform
to local standards. Depending upon the final layout and design of the raw
material storage building/blending and bagging plant, these "buildings" may be
incorporated under one roof to save space and cost.

6.7.4 Materials of Construction

For the purpose of estimating the cost of the major civil works (particularly the A-frame storage building) it is assumed that the major structural building supports will be made of imported structural steel framing members. Locally produced concrete will be used for all floors. Likewise, locally produced concrete block will be used for all building walls bearing a vertical load; for example, the lean-to attached to the A-frame structure, maintenance workshop, office showroom, and miscellaneous small buildings. The main roof of the A-frame bulk material storage building will be covered with plywood sheeting and hurricane-resistant T-lock shingles. Mineral composite or reinforced plastic sheeting may be used as an alternative to the plywood sheeting and T-lock shingle construction. In all cases, the use of galvanized steel or aluminum sheeting should be avoided as it has a very low resistance to corrosion caused by the combination of corrosive fertilizer salts and humidity. The relative cost of these material alternatives must be determined. Additionally, all exposed structural steel members should be sandblasted and protected with a corrosion resistant coating system.

6.7.5 Cost of Civil Works

A summary of the estimated cost for the major civil engineering works is shown in Table 6-2.

Table 6-1. Estimated Installed Cost of Machinery and Equipment

		Optimum	Plant	Simple Plant		
	Item	(US \$)	(H \$)	(US \$)		
			(11 5)	103 37	(H \$)	
1.	Blending and Bagging System					
	Raw material lump breaker/conditioner	11,000	0	11,000	0	
	Raw material bucket elevator	17,000	0	17,000	ō	
	Cluster hopper, 6 compertment	16,000	0)	•	•	
	Batch-type scale system	6,000	0			
	Mixer, rotary- or paddle-type	22,000	0 1	35,000ª	0	
	Conveyor belt with surge hopper	16,000	0			
	Portable bagging hoppers, 3 units	12,000	o ´	12,000	0	
	Hend-held sewing machines, 6 units	4,800	0	4,800	o o	
	Equipment installation	50,000	20,000	20,000	5.000	
	Contractor's fee	20,000	2.000	5,000	- •	
	Engineering and project management	30,000	2,000	•	1,000	
	- FG-110 management		<u>_</u>	10,000	0	
	Subtotal	204,800	22,000	114,800	6,000	
2.	Raw Material Unloading Equipment					
	Clam shells for ship unloading, two 1 m capacity used units	20,000		0	0	
	Dump trucks for transport of raw materials from wharf to storage building, two 15 m used units	20,000	0	20,000	0	
	Elevator/conveyor system for inloading bulk warehouse	80,000	20,000	80,000	20,000	
	Subtotal	120,000	20,000	100,000	20,000	
3.	Other Equipment					
	Front-end loader (1 m bucket)	18,000	0	18,000	0	
	Air compressor for general plant air,	3,000	ő	•	0	
	2 units	3,000	·	3,000	U	
	Emergency electric power generator (75 kWh)	25,000	5,000	25,000	5,000	
	Subtotal	46,000	5,000	46,000	5,000	
4.	Containerization and ocean transport for imported equipment items	6,000	<u> </u>	5,000	0	
	Subtotal	6,000	0	5,000	0	
TOTA	T	376,800	47,000	265,800	31,000	

a. Preassembled system consisting of a ground-mounted batch scale, rotary mixer, and product discharge conveyor (refer to Figure 6-3).

Table 6-2. Estimated Cost of Buildings and Civil Works

	Optimum	Plant	Simple Plant			
Item	US \$	Н \$	US \$	Н\$		
Raw material storage building including area for process plant and bagged product storage and truck loading	200,000 (2,30	50,000 0 m ²)	150,000 (1,50			
Maintenance workshop including space for maintenance materials and special products storage (agricultural chemicals and implements)	O	15,000	0	15,000		
Office and showroom including underground cistern for storage of potable water, basic office equipment, and air conditioning unit a	1,000	20,000	1,000	20,000		
Upgrading of existing raw material unloading wharf	5,000	20,000	0	20,000		
Plant yard and wharf security lighting	1,000	4,000	1,000	4,000		
TOTAL	207,000	109,000	152,000	84,000		

a. These "buildings" and work/storage areas may be incorporated into main raw material storage building structure, thus saving as much as 50% of the indicated cost.

b. Does not include interest during construction. This interest, however, is included in the financial analysis.

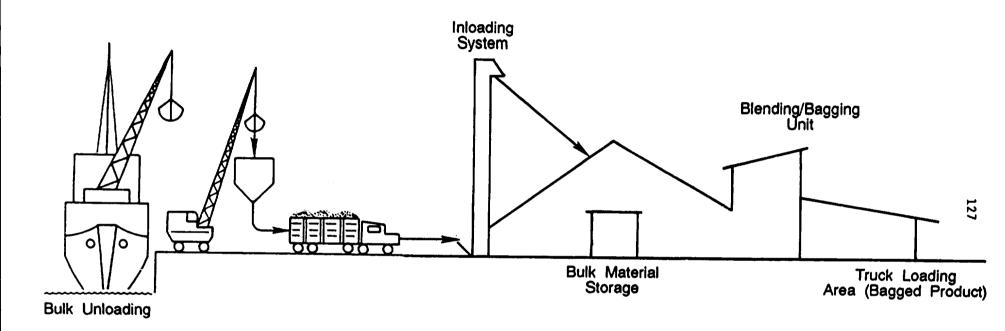


Figure 6-1. Overall Process Flow Diagram for Proposed Fertilizer Blending and Bagging Plant.

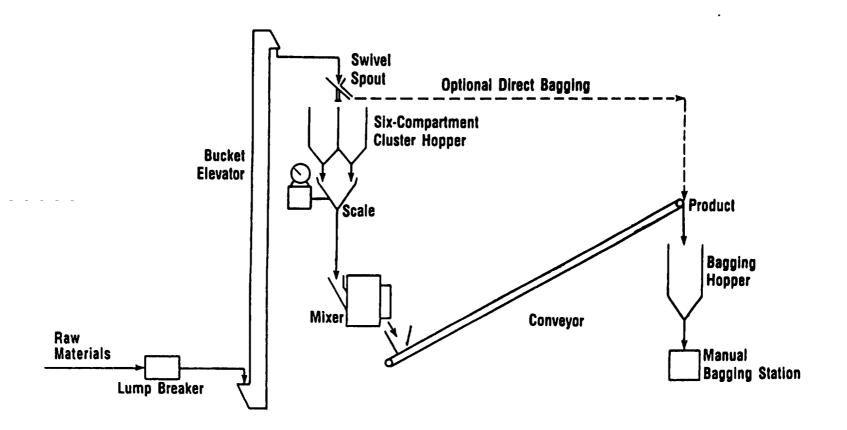


Figure 6-2. Flow Diagram of Blending/Bagging System Used in Optimum Plant Scenario.

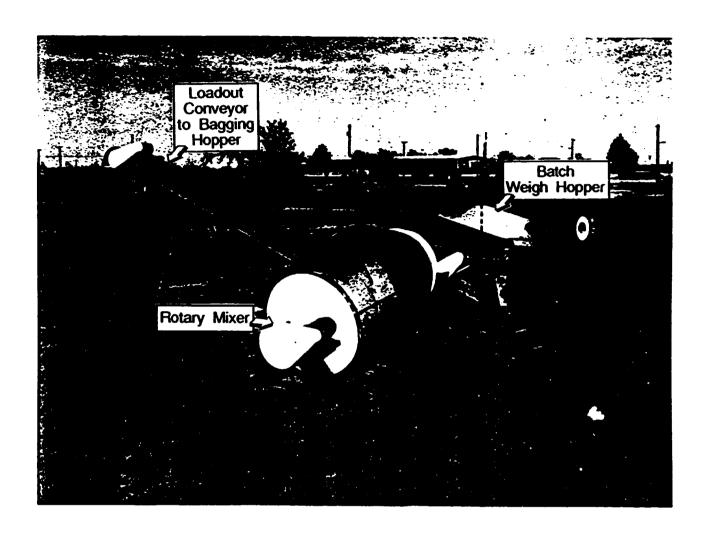


Figure 6-3. Blending Unit Used in Simple Plant Scenario.





Figure 6-4. Manual Bagging Operation as Practiced in Many Developing Country Locations.

7.0 PLANT ORGANIZATION AND OVERHEAD COSTS

Due to the relative simplicity of this project and the low level of staffing, the only overhead cost specified is for the recurring annual land lease. The cost of this lease amounts to H \$6,000/year and is indicated as "factory overhead" in the production cost summary.

8.0 MANPOWER

8.1 Project Staff Organizational Layout

An organizational layout for the full-time project staff is shown in Figure 8-1. The staff responsibility is divided into two major activities: (1) general administration and sales and (2) production. A description of the duties and responsibilities of these two staff categories follows.

8.1.1 General Administration and Sales

This staff, headed by the president-general manager, who is responsible for the entire project, carries out the following major functions:

- 1. Procurement and scheduling of all raw material and production inputs.
- 2. Marketing and sales, including technical assistance and services to dealers and farmers.
- 3. Scheduling of plant production program.
- 4. Dispatching of all products to dealers and other approved accounts.
- 5. Accounting, credit, and related financial activities.
- 6. Payroll, insurance, bookkeeping, and general administration.
- 7. Plant security, safety, and public relations.

8.1.2 Production

This staff, headed by a plant superintendent, who reports directly to the president-general manager, is responsible for material unloading, warehousing, blending and bagging, maintenance, and all other production-related activities including the procurement of short-term contract labor and services.

8.2 Annual Cost of Project Staff

The total full-time project staff shown in Figure 8-1 numbers 19. The estimated annual cost, including employee benefits and bonuses, for these full-time employees is shown in Table 8-1.

In addition to these full-time employees, a number of contract employees will be hired from time-to-time on a short-term basis to assist with unloading shipments of raw materials and otherwise assisting during peak periods of business activities. The cost of contract labor and related services is included in the cost of raw materials described in Tables 4-5 and 4-6.

Table 8-1. Estimated Annual Fixed Cost of Full-Time Project Staff (Manpower)

		Estimated	l Cost
	Number	Monthly	Total
Staff Member (Position)	Required	<u>Salary^a</u>	Annual
	(H \$	· · · · ·	
Administration and Sales			
President and general manager	1	2,300	27,600
Technical sales representative	1	1,150	13,800
Finance manager/accountant	1	1,150	13,800
Cashier/bookkeeper	1	2.20	2,760
Secretary	1	575	6,900
Messenger	1	115	1,380
Security (guard) ^b	_6	175	12,600
Subtotal	12		78,840
Plant Operations (Direct Labor)			
Plant superintendent	1	1.380	16,560
Foreman/operator	1	350	4,200
Mechanic/operator	1	400	4,800
Operator	2	230	5,520
Laborer (bag hauler) ^c	2	115	2,760
Contract labor ^d	<u>-</u> :		
Subtotal	7		33,840
TOTAL			112,680

a. Includes 15% annual bonus.

b. Security personnel also assist with checking and monitoring raw material receipts and product dispatches.

c. In addition to indicated salary, bag haulers are paid H \$0.03/bag for handling which is included elsewhere as a variable production cost item.

d. In addition to the indicated full-time project staff, it may be necessary on occasion to hire 5 to 10 short-term contract laborers to assist with the manual bagging operation during peak periods of production. The cost of this additional labor is not included in this analysis as it would be very small and uncertain.

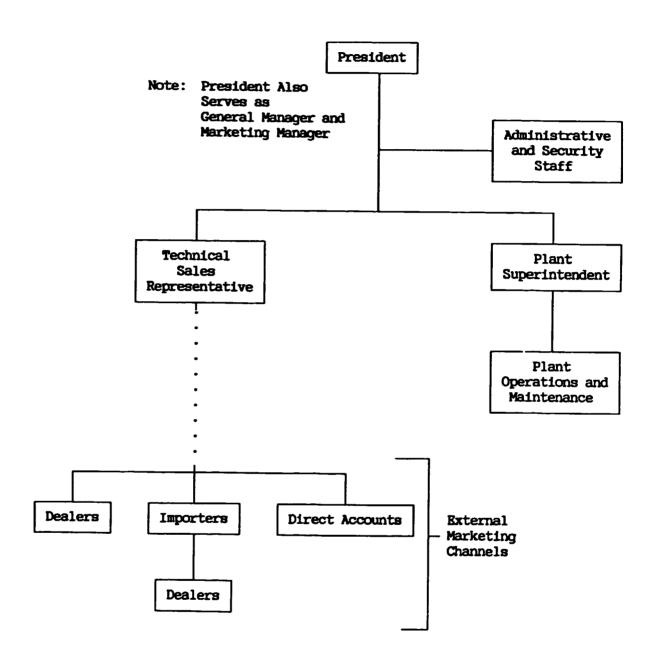


Figure 8-1. Organizational Structure for Proposed Fertilizer Plant.

9.0 IMPLEMENTATION SCHEDULING

9.1 Timeframe

A 1-year timeframe is estimated for the engineering, procurement, and construction of the facilities required for the project. Assuming project approval, including financing, is obtained by late 1991 and the appropriate company structure is formed, the plant will be ready for commercial operation in the beginning of calendar year 1992.

All expenditures required for construction of the plant facilities, including preproduction expenditures, will be disbursed during calendar year 1991. Revenue from the sale of products will begin to accrue in the beginning of calendar year 1992 according to the sales forecast described in Chapter 3.

10.0 FINANCIAL AND ECONOMIC EVALUATION

10.1 Evaluation Methodology

The financial and economic evaluation described in this chapter is performed according to UNIDO Guidelines for Preparation of Industrial Feasibility Studies using COMFAR® software (Computer Model for Feasibility Analyses and Reporting). Unless noted otherwise, all values are given in 1990 U.S. dollars. Refer to Table 10-1 for the basic assumptions used for preparing the financial analysis. Also refer to Volume II (Appendixes) for COMFAR® input data entry forms and output data tables.

10.2 Total Investment Cost

The total initial fixed capital investment required for the project (simple and optimum plant alternatives) is summarized in Table 10-2. The recurring investment required for the 15-year production program is indicated in Table 10-1 and the COMFAR® data tables in the Appendixes.

10.3 Project Financing

A relatively high equity-to-debt ratio of 1.0 is assumed for the project financing. This high equity ratio is assumed due to the lack of a stable government and, therefore, the lack of a stated government agricultural policy. Also, the general uncertainty of the Haitian market for fertilizers (including the impact of competition) adds to the risk of the project.

The project financial package is not final but is expected to consist of 50% equity provided by the project partners (promoters) with the remaining 50% secured from borrowed funds. While it may be possible to secure some donor equity, this source of equity funds is not considered in the analysis. However, the discounted cash flow calculations indicate, indirectly, the net present value of the project at which it is possible to achieve a specified discount rate of 15%. The difference between the actual value of the assets and the net present value indicates the level of donor

funding that would be required to make the project achieve the specified return on equity of 15%.

10.4 Total Production Cost

10.4.1 Annual Production Cost (Composite of All Products)

The total annual cost of production, in U.S. dollars, for each year of the project beginning in 1992 is shown in Table 10-3. These costs are based on the product mix and annual tonnage described in Chapter 3.

10.4.2 Production Cost by Product

A summary of the production cost for each product in the production program for selected years of the project is shown in Table 10-4. The variation in cost from year 1 to year 5 is due to the cost structure which varies depending upon the amount of working capital and the loan repayment and depreciation schedule (refer to Table 10-4 for annual financial cost data).

10.5 Financial Evaluation

10.5.1 Commercial Profitability Criter's (15-Year Project Life)

Net Present Value and Internal Rate of Return--The following is a summary of the net present value and internal rate of return for the two project scenarios (simple and optimum plant) assuming a 15% discount rate and two levels of product selling price (to importers and dealers) f.o.b. factory gate.

	Simple Plant	Optimum Plant
Discounted Selling Price (List Price Less 5%, Less 5%) ^a		
Net present value Internal rate of return	(-) US \$1.59 million (-) 12.2%	(-) US \$1.17 million 2.1%
Maximum Selling Price (No Disco	unt) ^a	
Net present value Internal rate of return	(-) US \$547,000 6.7%	(-) US \$131,000 13.7%
 Discounted price is more ap to sales to dealers. 	plicable to sales to ex	isting importers than

<u>Payback Period</u>--In both project scenarios, the payback period exceeds the assumed project life of 15 years.

Simple Rate of Return--The simple rate of return for each year of the project is indicated as return on investment (ROI) in the COMFAR® net income tables.

For the simple plant scenario the ROI is negative throughout the 15-year project life. With the optimum plant scenario the ROI is (-)7.1% in the first year (1992), but it gradually improves to about 1.5% in the sixth year (1997) and levels off at about 4% in the eleventh year (2002) of the project.

Break-Even Analysis--According to the projected market share, estimated production cost profile, factory-gate selling prices, and desired minimum return on investment of 15%, both project scenarios (simple and optimum plants) do not reach the break-even point during the 15-year project life.

Sensitivity Analysis—Because the overall project cost structure is so highly dependent upon the cost of imported raw materials, there is little scope for decreasing the factory-gate production cost except by optimizing the landed cost of raw materials. The foregoing analysis already examined the financial impact of (1) fixed capital investment and (2) the base-case factory-gate selling price to importers and dealers.

The following analysis shows what f.o.b factory-gate selling prices would be required in the more cost-effective optimum plant scenario to obtain the desired internal rate of return of 15% and a cumulative net present value of zero for the project at the end of 15 years (assuming an exchange rate of H \$1.5-to-US \$1.0).

	<u>Values Used fo</u>	r Base-Case Analysis	
	Discounted	List f.o.b. Selling	Required ^b
	f.o.b. Selling Pri	ce Price (No Discount)	f.o.b. Selling Price
		H \$/t)	(H \$/t)
Urea	287	318	322 (35)°
Ammonium sulfate	221	244	248 (27)
20-20-10	314	347	352 (38)
12-12-20	287	318	322 (35)
14-14-14	307	340	344 (37)
Internal ra	ite		
of return	ı, x 2.1	13.7	15.0

a. Refer to page 69.

10.5.2 Cash-Flow Analysis

The annual cash flow of the project for each year of the 15-year project life is given in the COMFAR® Cash Flow Tables for each plant scenario (refer to Appendix). A summary of the net cash flow for years 1, 6, and 15 of the project for the two plant scenarios using two levels of product selling prices (to importers and dealers) f.o.b. factory gate is shown below.

	Net Cash Flow					
Year		Optimum Plant and US \$)				
Discounted Selling Price (List Price Less 5%, Less 5%) ^a	(chouse	d 00 V)				
Year 1	(-) 276.7	(-) 348.1				
Year 6	(-) 139.5	1.74				
Year 15 (end of project)	(-) 121.7	123.6				
Cumulative discounted cash flow (at 15%) for 15-year project life	(-) 1,588.3	(-) 1,172.1				
List Price (No Discount)						
Year 1	(-) 209.0	(-) 280.5				
Year 6	62.4	203.6				
Year 15 (end of project)	108.7	425.9				
Cumulative discounted cash flow (at 15%) for 15-year project life	(-) 547.4	(-) 131.2				

a Discounted price is more applicable to sales to existing importers than to sales to dealers.

b. This price structure would result in an overall internal rate of return for the project of 15% and an accumulated net present value of zero at the end of 15 years.

c. Value in brackets indicates the increase in selling price per tonne over the discounted selling price.

Table 10-1.	Basic Assumptions used for Preparing Financial Analysis of
	Proposed Haiti Fertilizer Plant Project Using COMFAR®

Proposed Haiti Fertilizer Plant Project Using COMFAR®				
Life of project				
and of project	15 years			
Duration of construction	1 year			
Discounting rate for net present value	15%/year			
Initial investment:				
Distribution between loans and equity for each currency (H \$ and US \$)				
Loans	50 %			
Equity	50% 50%			
Interest for loans	15%/year			
Amortization period for loans	10 years			
Investment for replacement of vehicles in Year 9:				
Amount borrowed	US \$38,000			
Interest	15%/year			
Amortization period	7 years			
All other money requirements handled through bank overdraft at interest rate of 22%/year				
Salvage value at end of 15-year project life	Zero			
Recurring investment for machinery and equipment	US \$2,000/year			
Calculation of working capital:				
Accounts receivable	30 days			
Cash-in-hand	30 days			
Utilities	30 days			
Energy	30 days			
Spare parts	360 days			
Work in progress	0 days			
Finished product	2 days			
Accounts payable	30 days			
Raw materials:	Jo days			
Simple plant scenario	90 days			
Optimum plant scenario	180 days			
Taxes on income and/or profit	None			
Distribution of dividends to equity holders	None			
a. Refer to Volume II (Appendix X) for additional COMFAR®	input data.			
, oom m	input uata,			

Table 10-2. Summary of Total Initial Fixed Capital Investment

	Optimum	Plant	Simple Plant		
Item	US_\$	Н\$	US \$	Н\$	
Land (leased at H \$6,000/year)	0	0	0	0	
Site preparation and development	0	66,000	0	66,000	
Structures and civil engineering	207,000	109,000	152,000	84,000	
Incorporated fixed assets ^a	50,000	2,000	15,000	1,000	
Plant machinery and equipment ^b	326,800	45,000	250,800	30,000	
Preproduction expenditures ^c	166,300	0	139,400	0	
Subtotal	750,100	222,000	557,200	181,000	
Total Initial Fixed Investment (US \$)d	898	,150	677	,880	

a. Made up of engineering, project management, and contractor's fee.

b. Includes mobile equipment.

c. Made up of US \$60,000 feasibility study, contingency, and interest during construction.

d. Based on H \$1.5\$-to-US \$1.0 exchange rate. Values may not add due to rounding.

Table 10-3. Total Annual Production Cost for 15-Year Project Life

	1992	1993	1994	1995	1996	1997	1998	1999 (thousa	2000 and US \$)	2001	2002	2003	2004	2005	2006
Simple Plant															
Raw materials a Other	598.2 210.6		1,200.2	•	-	•	1,903.0 281.0	2,041.9 287.9	2,174.7 293.4	2,294.1 293,7	2,397.6 291.6	2,481.3 296.9	2,545.9 300.8	2,594.4 303.4	2,638.7 305,5
TOTAL	808.8	1,168.5	1,447.6	1,779.1	1,899.6	2,038.0	2,184.0	2,329.8	2,468.1	2,587.8	2,689.2	2,778.2	2,846.7	2,897.8	2,944.2
Optimum Plant															
Raw materials a Other	540.1 238.2		1,083.7 273.3	-	•	•	1,719.2 301.4	1,844.7 306.4	1,964.6 309.8	2,072.5 307.6	2,166.0 302.7	2,241.6 308.0	2,300.0 311,8	2,343.8 314.4	2,383.8 316.5
TOTAL	778.3	1,104.2	1,357.0	1,657.4	1,765.8	1,889.9	2,020.6	2,151.1	2,274.4	2,300.1	2,468.7	2,549.6	2,611.8	2,658.2	2,700.3
Product Mix															
Granular urea Standard ammonium sulfate	2,126 49	3,245 103	4.099 132	5,016 167	5,236 181	5,666 195	6,119 211	6,566 226	6,993 241	7,377 254	7,709 266	7,979 275	8,186 282	8,342 288	8,484 293
20-20-10	82	103	132	167	181	195	211	226	241	254	266	275	282	288	293
12-12-20	850	1,442	1,917	2,508	2,889	3,126	3,376	3,623	3,858	4,070	4,253	4,402	4,517	4,602	4,681
14-14-14	164	258	331	502	542	586	633	679	723	763	798	825	847	863	878
Total Annual Production, t	3,271	5,151	6,611	8,360	9,029	9,768	10,550	11,320	12,056	12,718	13,292	13,756	14,114	14,385	14,629

a. Not including bags and miscellaneous operating supplies.

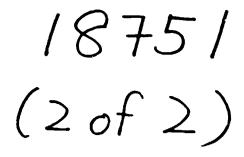
b. Includes all other factory operation, administration, marketing, depreciation, and financial costs.

c. Annual production values applicable to both plant scenarios.

Table 10-4. Total Production Cost by Product for Selected Years of Project

			Product				
	Ammonium						
Year of Besieve		Sulfate					
Year of Project	Urea	(Standard)	20-20-10 \$/t bagged prode	12-12-20	14-14-14		
Pi1 - B1		,,,,	0, 0 11gt pros				
Simple Plant							
Year 1 (1992)3,271 ttal production							
Raw materials b	192.9	107.8	199.8	164.0	163.8		
Conversion cost	39.6	39.6	39.6	39.6	39.6		
Depreciation	9.3	9.3	9.3	9.3	9.3		
Financial cost	<u> 15.5</u>	<u>15.5</u>	<u> 15.5</u>	<u>15.5</u>	<u>15.5</u>		
TOTAL	257.3	172.2	264.2	228.4	228.2		
Year 6 (1997)9,768 t total production							
Raw materials a	192.9	107.8	199.8	164.0	163.8		
Conversion cost	21.6	21.6	21.6	21.6	21.6		
Depreciation	3.2	3.2	3.2	3.2	3.2		
Financial cost	<u>3.5</u>	3.5	3.5	3.5	3.5		
TOTAL	221.2	136.1	228.1	192.3	192.1		
Year 15 (2006)14,629 t total production							
Raw materials a	192.9	107.8	199.8	164.0	163.8		
Conversion cost ^b	18.6	18.6	18.6	18.6	18.6		
Depreciation	2.2	2.2	2.2	2.2	2.2		
Financial cost	0.1	0.1	0.1	<u>0.1</u>	0.1		
TOTAL	213.8	128.7	220.7	184.9	184.7		
Optimum Plant							
Year 1 (1992)3,271 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8		
Conversion cost	39.6	39.6	39.6	39.6	39.6		
Depreciation	12.7	12.7	12.7	12.7	12.7		
Financial cost	20.6	20.6	20.6	20.6	20.6		
TOTAL	246.6	161.5	256.0	222.3	222.7		
Year 6 (1997)9,768 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8		
Conversion cost ^D	21.6	21.6	21.6	21.6	21.6		
Depreciation	4.3	4.3	4.3	4.3	4.3		
Financial cost	4.6	4.6	4.6	4.6	4.6		
TOTAL	204.2	119.1	213.6	179.9	180.3		
Year 15 (2006)14,629 t total production							
Raw materials a	173.7	88.6	183.1	149.4	149.8		
Conversion cost ^b	15.6	18.6	18.6	18.6	18.6		
Depreciation	3.0	3.0	3.0	3.0	3.0		
Financial cost	0.1	<u>0.1</u>	0.1	0.1	0.1		
TOTAL	195.4	110.3	204.8	171.1	171.5		

a. Indicated cost includes allowance for an overall shrinkage (loss) of 3 0%.
 b. Includes all direct and indirect costs of production.



<u>Volume II</u> (Appendixes--Final)

Fertilizer Plant Feasibility Study-Haiti

Prepared for

United Nations Industrial Development Organization (UNIDO)

and

United Nations Development Programme (UNDP)

UNIDO Contract No. 90/028/GYL UNIDO Project No. DP/HAI/89/033

Prepared by

International Fertilizer Development Center (IFDC)
Muscle Shoals, Alabama, U.S.A.

IFDC Contract No. 00926/90

October 1990

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APPENDIX I

Sales Promotion/Radio Advertising

	Objectives	Materials		Mechanics
1.	To promote sales of complex fertilizer grades and brand identity.	 T-shirts printed front and back with the layout of complex NPK fertilizer bags. 	1.	(a) One (1) free T-shirt with purchase of five fertilizer bags. (b) Given together with the fertilizer purchased.
2.	To promote fertilizer brand identity.	 Red apron blouse for "marchands" printed with bold white letters "fertilizer sold here" in creole. Emphasis on the fertilizer brand/logo. 	2.	One (1) apron blouse given free to each marchand on market days. Record name/receipt to avoid duplications.
	To promote fertilizer brand identity,	 Cardboard 24 x 18 in "fertiliser sold here" sign in creole. Emphasis on the fertiliser brand/logo. 	3.	One sign posted for every dealer store selling company products.
4.	To promote sales of fertilizer	 30-sec radio commercials in creole on fertilizer use on rice. Emphasis on the brand. 	4.	Choose most listened to radio station and program for airing radio spot commercials just before and during the planting season.

APPENDIX II

Forward Stocking Program

I. Objectives

- 1. To preempt competition and secure sales.
- 2. To utilize the warehouse facilities of the dealer.
- 3. To support the development of the dealer network and/or direct accounts.

II. Operating Guidelines/Conditions

- Select reputable high potential sales volume dealers and accounts in the priority market target area that have warehouse facilities.
- Establish a challenging fertilizer volume forecast (in bags) for 1 month which the market can absorb.
- 3. Prepare a forward stocking agreement which should specify:
 - a. Fertilizer product in bags or tonnes forecasted for 1 month.
 - b. Delivered price to dealer's warehouse.
 - c. Scheduled invoicing every 2 weeks.
 - d. Each scheduled invoicing will be supported with a postdated check.
- Discuss the program with the dealer or account regarding participation and meeting the requirements.
- 5. Deliver the volume of products covered by the agreement to the dealer's or account's warehouse.

III. Program Evaluation

- Check the movement of sales to determine whether forecast or scheduled volume for invoicing is realistic; make necessary adjustment.
- Renewal will depend on the success of the program. In case of renewal, the deadline should be before the last scheduled invoicing is due to preclude competition's interest.

APPENDIX III

Cash Bond Program

I. Objectives

- 1. To establish secured credit line for dealers and accounts.
- To facilitate withdrawal of products and payments.
- 3. To generate secured sales.

II. Operating Guidelines/Conditions

- Offer to dealers or accounts to advance the payment for purchases by accepting these as cash bonds to secure a credit.
- 2. Allow the cash bond to earn interest at better rates than offered for a savings deposit.
- 3. Dealers and accounts can withdraw products against the cash bond.
- 4. The interest earnings will be computed on the unutilized amount at certain cut-off periods.
- 5. To maintain the credit line, the dealer or account has to deposit the same amount to replenish the cash bond utilized for purchases and maintain the credit line.

III. Program Evaluation

- Evaluate the performance of the program and determine if it is necessary to increase the interest on cash bond to attract more dealers and accounts.
- 2. Evaluate the advantage and disadvantage of a joint program with a bank.

APPENDIX IV

Technical Services Programs

I. Soil Testing/Fertilizer Recommendation

A. Objectives

- To provide farmers and operators of plantation and industrial crops with the correct rate and method of fertilizer application per hectare for crops with the involvement of dealers
- To encourage farmers to use fertilizer to improve the production of crops and increase the fertilizer market.

B. Operating Guidelines

- 1. Provide the soil sampling procedures for seasonal and permanent crops; use soil sample information form to record the background data of the farm where the samples were taken. The procedure should include submitting the samples to the soil testing laboratory and paying for the laboratory services.
- 2. Train the dealers to assist in soil sampling, submission of soil samples, and servicing the fertilizer recommended.
- 3. Subsidize part of the soil analysis cost and set the fee that is affordable by farmers.
- 4. Require dealers to monitor the farmer's crop yield resulting from the fertilizer recommendation.
- 5. Prepare testimonials from dramatic results of the recommendation to promote the program to farmers.

C. Program Evaluation

- Evaluate dealer involvement as part of dealer performance;
 basis for dealer training and development.
- Evaluate attainment of soil sample forecast and if the sampling is directed to priority areas/crops.

II. Farm Demonstration

A. Objectives

- To demonstrate local proof of the desirability and profitability of fertilizer practice or series of practices.
- To provide a nucleus for field days, field tours, farmers' meetings, and other activities.
- To promote close relationship between the company's dealers and farmers.
- 4. To "sell" to the individual farmer on whose farm the demonstration is conducted and his neighboring farmers the effectiveness of company's products.

B. Operating Guidelines

- 1. Conducted on a cooperative basis between the farmer cooperator and the company's dealer.
- 2. Farmer-cooperator to provide the demonstration area, farm labor, and pay at harvest time for the cost of inputs used.
- Dealer to advance the cost of inputs and assist in the technical supervision of the demonstration; utilize farm demonstration to conduct field days for neighboring farmers.
- 4. Company technical sales representative to provide overall planning, direction, and supervision, particularly:
 - a. Selection of farmer-cooperation and farm site.
 - b. Laying out the farmers' practice and the recommended practice.
 - c. Proper application of inputs.
 - d. Installing the signboard.
 - e. Conduct of field days.
 - f. Recording/documenting results.

C. Program Evaluation

- 1. The farm demonstration should be evaluated in terms of:
 - a. Conduct.
 - b. Economics of yield.
 - c. Technical benefits to neighboring farmers.
 - d. Testimonial material.
- 2. Dealer involvement and assistance and impact on sales.

APPENDIX V

Dealer Training

I. Objective

- A. To update dealers in selling approaches, tools, and techniques applicable to their business so they can obtain better profits.
- B. To enable dealers to understand their role in food production and servicing the farmers' needs for quality products and advances farm technology.
- C. To enable dealers to fulfill their commitment to company policies and programs.

II. Operating Guidelines

- A. Methodology consists of lectures and group presentation in the classroom and field trips to farm demonstrations, field days, and experiment stations. Training could be planned for 2 to 3 days; dividing the period into classroom and field trips.
- B. The training courses should be designed in progression, i.e., course one will cover the fundamental subjects first.

An Example of a Progressive Training Course

Training Course	Subjects	Qualification of Dealer Participants
Course one	 The company Sales forecasting Sources and administration of credit Farm demonstration/soil testing programs Sales tools/techniques Fertilizer usage in crops 	Newly appointed dealers
Course two	 Handling competition Fertilizer handling and inventory control Financial management Pests and diseases of major crops Product knowledge/package of technology Understanding the farmer client 	Dealer who completed course one

III. Program Evaluation

- A. Relate dealer sales performance evaluation with dealer training.
- B. Utilize dealer training to upgrade the capability of dealer network.
- C. Provide achievement awards to encourage good performance.

APPENDIX VI

COMFAR® Financial Tables for Simple Plant Scenario
Using Currency Exchange Rate of H \$1.5 to US \$1.0



------ COMFER C.1 - INTERNATIONAL FESTILITER DEV. CENTER, PLASANA --

Waiti-Bulk Blend-Sieble Flant-1.5:1

August 30, 1990

Discounted Selling Frace

I year(s) of construction, 15 years of production

currency conversion rates:

foreign surrency 1 unit = 1.0000 units accounting currency local currency 1 unit = 0.6667 units accounting currency accounting currency: Thousands of US Dollars

Total initial investment during construction phase

fixed	assets:	877.88	39.66€ % fareiga
curreat	assets:	9.00	0.000 % foreign
tctal	assets:	577.8S	79.664 % fareign

Source of funds during construction ease

equity &	grants:	338.80	79.598 % foreign
foreign	leans :	149.68	•
local	loans :	57.12	
totai	funds :	577.51	79,598 % Fareign

Cashflow from operations

Year: operating costs: depreciation : interest :		1973.02	15 1910.57 32.17 1.19
production costs thereof foreign	508.79 75.1: %	2038.02 83.85 %	1944.20 35.12 %
total sales :	627.3 9	1671.73	2803.24
gross iscome :	-181.40	-156.24	-140.93
net incass :	-181.40	-156.24	-:40.77
cash dalanca :	-344.21	-207,04	-130.83
net cashilta :	-276.70	-:27,53	-121.70

Net Present Value | at: 15.00 % = -:583.02

Internal Rate of Return: -12.11 % Peturn on equity1: not found Seturn on equity2: -14.36 1

Index of Schedules mumbly WMA

Total initial investment Tatal investment during incounties Total predvetica costs Wur ing Casital Passifianante

Casatlow Tables Andjected Balanca National acutament Course of Auryous



***************************************	•••••••		INTERNATIONAL	FERTILIZER !	BEV. CENTE	. Alabama
Total Initial Invest	ment is	Thousants of US Bollars				,
Year	1991					
Fixed investment costs Land, site preparation, development Buildings and civil works Auxiliary and service facilities . Incorporated fixed assets Plant pachinery and equipment	20 8.0 03 0.000 1 5.6 67					
Total fixed investment costs	539.473					
Pre-production capital expanditures. Net working capital	139.411 6.000					
Total initial investment costs	677.884					
Of it foreign, in 1	79.654					
		Haiti-B	ulk Bland-Simp	ie Plant-1.5	::	August IV,



***************************************			- Internationa	u Fertiliter Dev.	CENTER, ALABAMA	
Total Current Invest	ment is	Trousands of US Doll.	ers			
Year	1992	- 257	:59£	1995	1994	
Fixed investment costs						
land, site preparation, development	0.000	0.000	0.000	2,243	0.000	
Buildings and rivil age/s	3.000	5, (5)	5.000	3.000	0.300	
Land, site preparation, development Buildings and civil works Auxiliary and service facilities .	0.000	0.000	0.000	5.000 6.366	2.100	
incorporated fixed assets	0.200 0.200	0.000	2.000	7.00.	9.009	
District and an in the	2,000	0.100	5.000	2.000		
Flant, machinery and equipment	2.000			2.500	1.009	
Total fixed investment costs	2.000	2.000	2.009	2.000	2.300	
Preproduction capitals expanditures. Working Capital	c.c co	0.000	3,000	0.000	0,000	
Working capital	174.515	72.107	71.721	85.125	31,594	
Total current investment costs	17! 716	74.107		57 15E	77 564	
Total Current Investment tosts	1/5,315	75.10/	13.721	07.129	30.075	
Of it foreign, I	83.878	99.273	88.357	£3.17 6	95.178	
		Ha	iti-Bulk Blead-Si:	sple Plant-1.5:1	August 31	: :==
		CONFAR 1.	1 - INTERNATION	AL FERTILIZER DEV	. CENTER, ALAESSA	
Total Current Invest	ment is	Thousants of US Doll	ārs			
Year	1597	;çş <u>ş</u>	1979	2000	1001	
Fixed investment costs						
land eita sessientias de element	0.730	6.555	5.366	0.000	0.000	
Enilaine and minit ments	0.000	2.000	0.000 A AAA	3.000	0.000	
Filedings and fivia works	V.50J	0.000 0.000	3.000	9.000	0.000	
Auxiliary and service facilities .	0.000	3.900	0.000	6.966 6.666	0.000	
Incorporated fixed assets	0.000	0.000	0.000	0.000	3.000	
rixed investment costs Land, site preparation, development Euildings and civil works Auxiliary and service facilities . Incorporated fixed assets Plant, machinery and equipment	2.060	2.000	40.000	2.000	2.000	
Total fixed investment costs			40.000	2,000	2.00	
Pesagoduction esastals superfit con	A 444	4 144	0.656	9 266	5 685	
The Communication of the Commu	7, 556	7,575 70 770	77 54.	0.000 3 5. 127	72. 775	
Preproduction capitals expenditures. Working cavital		15.4.7	0/,501 			
Total current investment costs					14.475	
St in towns w						
Of it foreign, %	13,547	53.5:1	94.130	58.649	88.714	

Hasti-Bulk Blend-Bissla Flant-1.0:1 --- August 70. 199



	************		- INTERNATION	al femilier is:	y. Center, Resera
Total Current Investa	aent :a	Thousands of US Collar	· 5		1
fear	2002	2013	700y	20/2	2008
Fixed investient costs					•
lama, site preparation, development Buildings and civil works Auxiliary and service facilities .	0.000 0.000 0.000	A 144	9.309 9.000 9.000	3.333 3.333 6.563	0.000 0.000 0.000
Incorporated fixed assets	0.060 2.000	3.000	0.038 2.000	0.000	0.000 0.000 2.000
Total fixed investment costs	2.560	2.9%	2.000	2.503	2.660
Freemoduction capitals expanditures.	9.000 23.155	••••	0.000 17.559	0.696 !3.2}f	3.33 9 -2.574
Total current investment costs	39.166	54 TT	19.567	15.201	14.673
Of it formign, I	58.811	89.550	59,241	39.595	59.718
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					

Haiti-Bulk Blend-Biasle Flant-1.5:1 --- August II,



			s ert – Eulekia.	riomal Fertilizer	DEV. CENTER. ALABAMA
Total Production Cos	stsia Da	sanda of UE Dalla	ers		
ear	:572	207	1991	:945	1976
of aca. capacity (single product).	3.000	3.000		6.000	0.000
aw Gateriai i	598.167	95a.593	1200.164	1517.507	1813.304
ther raw saterials	37.073	59.361	74.922	94.751	102.734
tilities		5.885	5.871	9.000	9,449
nergy		1,994	5.235	5.520	5.433
Dour, direct		2:.337	22.42:	23,121	25.788
egair, maintenance	A. 000	0.000	0.000	0.000	0.000
pares	2.833	1.23	2.533	2.833	2.633
actory overheads	1.000	4.500		4.000	
actory costs	572.441	1034.494	13:5.4:3	!651.031	1775.240
Mainistrative overheads		=5.133	55.138	55.133	55.138
dir. costs. sales and distribution		0.000	0.000		
rect costs, sales and distribution			0.000	0.000	0.000
egreciation	77 76A	74.507	30.656	30.787	30.722
inancial costs	<b>53.821</b>	19.318	45.439	42.129	33.322
otal production costs	208.790	1169.472	1447.648	1779.086	1899.602
=		=======================================		***************************************	
ists per unit ( single product ) .	0,000	5,000	0.000	0.000	0.600
it foreign, Z	78.114	81,059	92.344	33.319	33.371
it variable, L	79.941	25.695	58.644	90,938	91.7¢ė
otal labour	76.223		77.557	75.259	78.526

Maiti-Eulk Bland-Simple Flant-1.5:1 --- August 30, 199



**********					-, !	-	ingentalienet periodien devi (	ENIEN.	ALABATA
Total	Production	Costs	Thougands of th	6 4134	-=				1

Total Production Co	ostsin Tho	usands of US Coll	253		
Year	1997	:355	• 577	745A 2717	2301
I of non. capacity (single product).	0,000	7 8 6 7 8 7 7	A AAA	0.000	0.000
Raw material 1	1761.559	1002.992	2041.903	2174.259	2274.075
Other raw materials	110.710	1907.992 119.573	2041.903 128.300	135.641	1:4.:45
Utilities	8.942	9.465	9.926	10.472	10.914
Energy	5.755	I.553	5.010	e.131	5.240
Labour, direct	23.564	23.997	24.305	24.599	24.864
Repair, maintenance	0.000	9.000	9,000	0.000	0.000
Spares		2.533	2.833	2.673	2.833
Factory overheads		4,000	4.000	4.000	4.000
racedly eyerneads a	7.000	7,000	7.434		7.900
Factory costs	1917.283	2048.747	2217.330	2359.333	2437.072
Administrative overbeads	55,178	55.138	55.138	55.173	55.138
Indir. costs. sales and distribution	0.000	3.000	3.000	0.000	9.000
Direct costs, sales and distribution	0.000	0.000	0.000	0.000	9.000
Depreciation		31.189	31.32.	31.454	31.587
Financial costs		28.910	25.970	52.165	13.990
Total production casts	2038.020	2183.972	2329.760	2469.071	2597.787
ice. production cases	£490.954	1150.7/5	2027,106	1703,071	200:161
Costs per unit ( single product ) .	3.000	3.003	0.000	0.000	0.000
Distribute 7	0.000 07 0/E			54.607	
Of it foreign, I	53.503	84.135	84,335	2*.5v/	24.758
Of it variable, I	92.472	93.205	93.751	P4.250	74.826
Total labour	19.522	79.135	79.443	72,737	80.002

Haiti-Bulk Blend-Slaple Plant-1.5:1 --- August 30, 199



INTERNATIONAL	FERTILITES ISY	v. CENTER, ALABAMA
2004	14A1	2046
9.639	5 A.S.	1.001
7515 213	5592 371	1608.713
159.967	167.015	145.834
11.549	17,677	17,507
6.473	25.57	5.555
25.422	72 576	15.618
2 5 5 5		
V. 4 3 0	0.907 2.557	0.000
5.533	2.200	2.877
1,000	4.000	1.000
2756.493	2800.792	2955.775
55.138	55.179	55.132
0.000	2.500	0.000
A A A A	A AA :	0.000
9.098 31.665 7.463	77 110	7 <b>2.1</b> 65
7.123		1,191
7.123		7:
1346.655	2897.778	2944.23)
0.000	0.000	0.000
85.04£	55.0 <b>5</b> \$	£5.124
95.629	FE.747	95.865
90,540		
	95.629	95.664 FE.787 80.560 ED.668

Baitt-Bulk Blend-Black Blant-1.5:1 --- August 50, 199



		1.1 SARW22	- IN EARATIONAL	reminister dev.	PERIOD WINDOW
Net Working Capital is	Thousanes of US	Dollars			Į.
Year	1992	1787	1774	1575	1974
Coverage					•
Current assets à					
Accounts receivable 30 12.0	60.632	70.893	114.276	142, 151	:52,537
Inventory and materials . 90 4.0	60.632 159.193 6.765	249.232	319.342	402.555	433.438
Footes 30 19.6		3.416	9.436	1.450	0.457
Spares 360 1.0	2.333	2.533	2.833	2.933	2.837
Work in propress 0	0.000	0.000	0.000	0.000	0.000
Finished products 2 180.0	4.642	5.054	7.623 3.516	9,479	10.169
Cash in hand		3.473	3.516	3.546	3.557
Total current assets	3.451 233.551	352.829	448.0	5a1.054	£02.7 <del>5</del> 8
Current limitings and					
Current liabilities and Accounts payable	54.027	85.203	109.701	137.585	147.957
••					455,061
Met working capital	1/4.0.0	266.621 92.107	336.343 71.721	425.453	700.001 21.594
INCFERSE IN MUTKING CAPITAL	1/4.0.0	7267	#1#122	2000	01,074
Met working capital, Issai Net working capital, foreign	23.456	39,494	48,078	55,755	52.749
Net working casital, foreign	146.055	777 -77	270.255	Tá5.023	302.7:2
Note: ado = minimum dava of coverage : cata	y = cuafficient of		i-Bulk Bland-Bloot		August 30,
Note: adc = minimum davs of coverage : colo		Haiti	i-Bulk Bland-Blosi	a Plant-1.5:1	•
		COMFAR 2.1	i-Bulk Bland-Blosi	a Plant-1.5:1	•
	Thousenes of 25	Haiti COMFAR 2.1 Collars	i-Bulk Blend-Blosi - INTERNATIONAL	a Plant-1.5:1	•
Net Working Capital in	Thousenes of 25	Haiti COMFAR 2.1 Collars	i-Bulk Blend-Blosi - INTERNATIONAL	a Plant-1.5:1 FERTILIZER DEV.	CENTER, ALABAMA
Net Working Capital in Year	Thousenes of 25	Haiti COMFAR 2.1 Collars	i-Bulk Blend-Blosi - INTERNATIONAL	a Plant-1.5:1 FERTILIZER DEV.	CENTER, ALABAMA
Net Working Capital in Year	Thousenes of 25	Haiti COMFAR 2.1 Collars 1993	i-Bulk Blend-Blosi - INTERNATIONAL 1993	a Plant-1.5:1 FERTILIZER DEV.	CENTER, ALABAMA
Net Working Capital in Year	Thousenes of 25	Haiti COMFAR 2.1 Collars 1993	i-Bulk Blend-Blosi - INTERNATIONAL 1993	a Plant-1.5:1 PERTILIZER DEV. 2000	CENTER, ALABAMA COOL
Net Working Capital in Year	Thousenes of US 1997 184,415 A68,912	Haiti COMFAR 2.1 Dollars 1993 176.990 508.470	:-Bulk Blend-Blool - INTERNATIONAL 1997 189,272 543,382	a Plant-1.5:1 FERTILIZER DEV.	CENTER, ALABAMA  2001  211.851 810.465
Net Working Capital in Year	Thousenes of 03 1997 184,418 868,912 0,480	Haiti COMFAR Z.I Dollars 1993 176,990 508,470 508,470	i-Bulk Blend-Blosi - INTERNATIONAL 1993	a Plant-1.5:1 PERTILIZER DEV. 2000	CENTER, ALABAMA COOL
Net Working Capital in Year	Thousenes of 03 1997 184,418 868,912 9,460 0,800	Haiti COMFAR Z.I Dollars 1993 176,990 508,470	1-821k 81end-81cs1 - INTERNATIONAL 1993 189,272 540,082 0.801 2.800	a Plant-1.5:1 PERTILIZER DEV. 2000	CENTER, ALABAMA  2001  211.851 810.465
Net Working Capital in Year	Thousenes of US 1997 184,415 A83,912 0,460 0,807	Taiti COMPAR Z.I Dollars 1990 176.990 508.471 0.490 0.871	1-821k Bland-Blost - INTERNATIONAL 1993 189.370 540.382 0.801 2.800 3.000	2 Plant-1.5:1  FERTILIZER DEV.  2000  201.208  575.898  2.307  0.000	CENTER, ALABAMA  COOL  COL 851 610.465 0.500 0.500
Net Working Capital in Year	Thousenes of US 1997 184,415 A83,912 0,460 0,807	78155 COMPAR Z.1 Dollars 1598 176,950 508,471 0.490 0.371	1-821k 51end-8ical - INTERNATIONAL 1993 189,070 540,051 0,501 1,000 2,000	2 Plant-1.5:1  FERTILIZER DEV.  2000  201.205  575.698  0.605  0.000	CENTER, ALABAMA  2001  211.851 610.465 0.520 1.820 1.820 1.820
Net Working Capital in Year	Thousenes of US 1997 184,415 A83,912 0,460 0,807	78155 COMPAR Z.1 Dollars 1598 176,950 508,471 0.490 0.371	1-821k 51end-8ical - INTERNATIONAL 1993 189,070 540,051 0,501 1,000 2,000	2 Plant-1.5:1  FERTILIZER DEV.  2000  201.205  575.698  0.605  0.000	CENTER, ALABAMA  2001  211.851
Net Working Capital in Year	7housenes of 25 1997 184,415 868,912 0,460 0,801 0,001 10,761 0,899	78155 COMPAR Z.1 Dollars 1593 176.950 508.471 0.490 0.371 0.179	1-821k 51end-8ical - INTERNATIONAL 1993 189.070 540.051 0.671 0.675 0.675	2 Plant-1.5:1 PERTILIZER DEV.  C000  C01.C08  C75.698  0.503  0.000  11.604  1.607	CENTER, ALABAMA  COO1  C11.851 610.465 0.500 0.800 0.400 0.400
Net Working Capital in Year	7housenes of 25 1997 184,415 868,912 0,460 0,801 0,001 10,761 0,899	78155 COMPAR Z.1 Dollars 1593 176.950 508.471 0.490 0.371 0.179	1-821k 51end-8ical - INTERNATIONAL 1993 189.070 540.051 0.671 0.675 0.675	2 Plant-1.5:1 PERTILIZER DEV.  C000  C01.C08  C75.698  0.503  0.000  11.604  1.607	CENTER, ALABAMA  COO1  C11.851 610.465 0.500 0.800 0.400 0.400
Net Working Capital in Year	7housenes of 25 1997 184,415 868,912 0,460 0,801 0,001 10,761 0,899	78155 COMPAR Z.1 Dollars 1593 176.950 508.471 0.490 0.371 0.179	1-821k 51end-8ical - INTERNATIONAL 1993 189.070 540.051 0.671 0.675 0.675	2 Plant-1.5:1 PERTILIZER DEV.  C000  C01.C08  C75.698  0.503  0.000  11.604  1.607	CENTER, ALABAMA  COO1  C11.851 610.465 0.500 0.800 0.400 0.400
Net Working Capital in Year	Thousenes of US 1997 184,418 A68,912 0,460 0,807 10,707 10,707 459,804	Taiti COMFAR 2.1 Dollars 1992 176.990 508.471 0.490 0.490 0.500 0.1744 7.500 0.000	1-821k 51end-8ical - INTERNATIONAL 1993 189,070 540,050 0,576 0,576 752,768 114,778	2 Plant-1.5:1 PERTILIZER DEV.  2000  201.205 575.658  0.000 10.000 10.007 800.207	CENTER, ALABAMA  COOL  C11.851
Net Working Capital in Year	Thousenes of US 1997 184,418 A68,912 0,460 0,807 10,707 10,707 459,804	Taiti COMFAR 2.1 Dollars 1992 176.990 508.471 0.490 0.490 0.500 0.1744 7.500 0.000	1-821k 51end-8ical - INTERNATIONAL 1993 189,070 540,050 0,576 0,576 752,768 114,778	2 Plant-1.5:1 PERTILIZER DEV.  2000  201.205 575.658  0.000 10.000 10.007 800.207	CENTER, ALABAMA  COOL  C11.851
Net Working Capital in  Year	Thousenes of US 1997 184,415 A68,912 0,460 0,800 10,761 1,509 651,074 159,804	Taiti COMFAR 2.1 Dollars 1992 176.990 508.470 0.490 0.490 0.500 0.1799 7.590 0.000 0.1799 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0	1993 1993 1993 1993 1993 1993 1993 1993	2 Plant-1.5:1  FERTILIZER DEV.  2000  201.205  575.858  0.5:1  0.607  809.209  178.813	CENTER, ALABAMA  COOL  C
Net Working Capital in Year	Thousenes of US 1997 184,415 A68,912 0,460 0,800 10,761 1,509 651,074 159,804	Taiti COMFAR 2.1 Dollars 1992 176.990 508.470 0.490 0.490 0.500 0.1799 7.590 0.000 0.1799 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0	1993 1993 1993 1993 1993 1993 1993 1993	2 Plant-1.5:1 PERTILIZER DEV.  2000  201.205 575.658  0.000 10.000 10.007 800.207	CENTER, ALABAMA  COOL  C
Net Working Capital in  Year	Thousenes of US 1997 184,415 A68,912 0,460 0,800 10,761 1,509 651,074 159,804	Taiti COMFAR 2.1 Dollars 1992 176.990 508.470 0.490 0.490 0.500 0.1799 7.590 0.000 0.1799 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.0	1993 1993 1993 1993 1993 1993 1993 1993	2 Plant-1.5:1  FERTILIZER DEV.  2000  201.205  575.858  0.5:1  0.607  809.209  178.813	CENTER, ALABAMA  COOL  C

Mater rac a number of the transport of the control of the control

Subset Colleges and Competition - For Subset II



	Latific T. Lat.	181284911959	. Pertilizer (24.	. Center, Alabama
Thousands of US	5311354			
7965 2102	5049 8779	5004 A107	200 <b>2</b>	50A: 2010
				••••
221, 177	550 F <u>1</u> 6	374 855	070 /	
	220.070			112.27
	300; <u>.</u>			702.112
V.020	.,3.4	0.337		0.548
	2,200	2.000	2.933	2.833
	0.000	0.000	0.000	3.000
	:5, 276	15.623		.3.172
3.629	7 :72			1.00.
580.802	711.650			
		10-1012	:41.010	F67.F22
216.492	223.945	129.700	234.024	237.778
884,709	.S7 *0*		7.7.44.	
			/1/.27 <del>4</del>	729.944
201725	22.75%	17.559	13.201	12.070
27 143	•• •••			
		55 555 12:12:	93.834	95.281
5/8.902	396.987	512.420	624.040	834.55
	2000 221.077 637.999 0.508 2.833 0.000 14.738 3.629 980.802	Thouseads of US Collars  2002 2002  221,077 203,540 637,995 560,270 0.528 0.524 2.833 0.823 0.000 0.000 14.738 15.028 3.829 7.1050  218.432 223,545  &64.320 587,104 23.186 22.784 87,417 90.117	Thousands of US Collers  Z000 2000 2000  Z21.077 203.540 234.095 637.995 560.770 677.445 0.508 0.509 0.509 2.823 0.223 2.823 0.600 0.000 0.000 14.736 15.626 15.620 3.628 7.641 580.802 711.650 734.772  Z16.492 223.745 229.700  &64.320 537.104 704.673 23.166 22.784 17.567  87.417 90.147 52.055	2002   2003   2004   2005

Note: sdc = siniaum days of coverage ; coto = coefficient of turnover .

Haiti-Buik Bland-Blasie Plant-1.5:1 --- August 30, 1



-- COMPAR 2.1 - INTERNATIONAL FERTILIZER DEV. CENTER, ALABAMA Source of Finance, construction in Thousands of US Collers Year ..... 1901 Equity, ordinary ... 336.803 Equity, preference. Subsidies, grants . 0.000 3.000 Loan A, foreign . Loan B, foreign . Loan C, foreign . Loan A, local . . . Loan B, local . . . Loan C, local . . . 269.650 0.000 9.000 59.123 0.000 0.000 Total loan ...... 338.803 Current Habilities 0.000 Bank overdraft .... 0.277 Total funds ...... 677.264

Harti-Bull Blenc-Simple Flant-1.5:: --- August 30.



口游统 2.1 -INTERNATIONAL TERRITORIES DEV. CONTER, ALBERTA ----

Source of	rinance,	production S	Tous ands	req ;ees	122	
		∰ • Ng • 1 • 1 • 1 • 1 • 1 • 1 • 1 • 1 • 1 • 1	•			•
Parties and interv		5.565	٠.	2,026		
子が出るでする (2) 日本(10) · **						
MARINE DEBTOOM	-	<		4 20 4 20 4 20 4 20		
Subsidies, grants .	43 43 43 43	63 43 43 43	AAA 4.5	\$00 600 600		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
•		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				: }
road at toreion .		400 (100 E)		Ti de de a		
real E. foreign.		6 1 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	: :33	0.00		
Loan D. foreign		0.000	1000	3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000 3.000		6 JA 6 JA 6 JA
1037 2 1703		7 3 6		19 512		1 11 11 11 11
foen E, local		0 € 10 € 10 € 10 € 10 € 10 € 10 € 10 €	U: €3 €3	2.630		*****
Lean C, locai		(A) (B) (B)	0.00	0.000		< > < > < > < > < > < > < > < > < > <
Total loan	-15.657	10.40	-22,048	-25.570		- 30
Derrand Cindilities	•	17. 17.	34 L93	37 att		.s .e.
CONTRACT TERRETARE	•	200		1 6		
Bank Everdraft		1.4 65 65 65 67 77	246.830	138 mm	!	111111111111111111111111111111111111111
Dr. Cali	357.262	1	1 3 12 137 137 153 153 153	622.32		100 100 100 100 100 100 100 100 100 100
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二代の中かり行うので、見か用されても大変のの、この様なとしても見ると 76ps 77

COMPAN C.: - INTERNATIONAL SERVICITES DEV. DENTER, SLABARA ----

## Equity, ordinary ... Equity, preference. Subsidies, grants . Estate in Land Carrent listeliis Total Isan ...... Source o<del>f</del> П inance, 0.44.00 084984 13.18 10 production 13 6.00**3** 117 -82, 274 Thousands of 88 Dollars 5000 Laur Barr Carr -62.601 988 13 reservation reservations 大, [4] 2000 133



***************************************			COMPAR C.1 - INTERNATIONAL FEETILITER DOWN CONTER, A	LARA
Source of	Finance, .	: Jauction in	Chousance of US Collars	
Year	5691	2005	5108	
Equity, ordinary	0 000 0400	<b>0.0</b> 95	0.000 0.000	
Equity, preference.	0.000	0.000	1.103	
Substidies, grants .	0.000	3.033	0.000	
Loan 4. Horeign .	0.000	0.000	3.003	
Loan B. foreign	-5,008	-5.906	-7,7-2	
loan C. foreich .	0.000		0.000	
Loan A. local	0.000	0.000	0.009	
Loan B, local	0.000		0.000	
Loan C, local	0.000	0.000	0.000	
Total loan	-à.00á	-6.708	 -7.542	
Current liabilities	5.755	4.324	3,754	
Bank Gversraft	135.825		139.877	
Total fends	:35.418	129.079	125.644	

maiti-Bulk Blend-Siapla Plant-1.5:1 --- August 30,



Cashflow	Tables.	construction is	Thoresade of 50 Salling
----------	---------	-----------------	-------------------------

Year	1991
Total cash inflow	577.567
Financial resources . Sales, net of tax	677.±07 0.000
Total cash outflow	577.994
Total assets	852.473 0.000 25.410 0.000 0.000 0.000
Surplus ( deficit ) . Cumulates cash balance	-0.277 -0.277
Outflow, iscal Surplus ( seficit ) Inflow, foreign Outflow, foreign Surplus ( deficit )	-0.6:5
Net cashflow	-652.473 -662.473

Haiti-Bulk Blend-Simple Flant-1.5:1 --- August 30, 199



			COMFAS 3.1	- INTERNATIONA	L FERTILIZER JEV.	CENTER, ALABAMA
Cashflow tabl	es, produ	uction is	Thouseasts of LB	Ecllare		
Year	1992	1997	1574	1755	1995	1927
Total cash inflow	683.426	1015.540	1189,442	1927.940	1340.505	1887.867
Financial resources . Sales, net of tax	55.037 627.389	30.17: 986.369	27.493 1263.747	27.855 1641.978	10.3E1 1730.155	11.567 1971.761
Total cash cetflow	1027.638	1281.417	1575.277	1888.885	1941.830	2399.704
Total assets	232,551 727,579 50,821 16,687 0,600 0,000	124.278 1089.472 48.313 19.190 0.000 0.000	97,015 1371,551 43,439 32,028 0,638 0,638	115.010 1704.149 47.129 25.378 0.600 0.000	43.945 1830.378 03.022 29.885 0.000	23.175 1773.021 33.744 23.563 0.000 0.000
Surplus ( deficit ) . Cumulated cash belance	-344.212 -344.429	-254.877 -609.366	-246.831 -85 <b>6.1</b> 98	-253.823 -1115.019	-101.314 -1316.341	-207.03& -1523.379
Inflow, Iocal Cutflow, Iocal Surplus ( deficit ) . Inflow, foreign Outflow, foreign Surplus ( deficit ) .	636.444 215.088 421.359 46.792 812.552 -765.571	990.104 237.161 752.943 26.436 1044.256 -1017.520	1245,854 268,737 1000,115 29,558 1247,535 -1244,947	1605.465 312.855 1252.576 24.397 1575.790 -1581.393	1731.497 	1873.251 035.662 1534.589 10.416 1752.042 -1741.628
Net cashflow	-27£.705 -929.178	-197.070 -1126.548	-179,323 -1365,371	-191.316 -1497.185	-133.815 -1631.000	-139,529 -1770,531

Haiti-Buik Bland-Simple Plant-1.5:1 --- August D.



Cashflow tabl	les, prod	uction is	Thousands of US	Bollars	- Tantiagadh abis	uds.dx, ALABA
Year	1368	:::0	2000	2941 2941	7128 478	2003
Total cash inflow	2054,193	2215.561	2722.033	2447.713	2556.280	
Figancial resources . Sales, set of tax	12.572	\$0.736 8.7002	11.534			
			231G. 234	16.645 2437.068	=.12e 2547.354	7.460 2535.943
Total cash outflow	2244.339	2433.010	2541.076		2701.449	
Total assets	52,951	90.184	49.961	15 ' 11		
Operating costs	2123.581		2414.475	70:141	39,382 3652,924	32.047 2742.482
Cost of finance	78,910	25.970	22.162	4347.119	2552.924	2742.482
Repayment	78 572	44,397	14.182	13.790	4.573	3.711 E.722
Corporate tax	A 444		54.479	<b>62.651</b>	4.541	E.222
Dividenss said		0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	
uraius (deficit) .	-210 1AL	-213.449	240 470			
Comulated cash balance	-1733,525	-1946.973		-218.220	-145,149	-140.437
	11001025	71743.7/3	-2156.012	-2382.292	-2527.451	-1667.598
oflow, local	2023.177	2170.711	2311.658	2478.385	0545	_
utflox, iscal	357.674	575.969	393.274	44.0.353 ***********************************		267 <b>6.</b> 886
urolus ( deficit ) .	1445 507	1794.742		408.504		117.960
nflow, foreign	11.015	48.859	1919.392	2029.85:	2140.451	117.960 2213.926
itflow, foreign			10.369	9.327	3.034 2297.705	3.5-9 23-5.995
rolus ( deficit ) .		2057,040	2147.800	2255.428	2297.705	TIT CAT
mpawa i selibir i ,	-1975.649	-2008.190	-2137.431	-2248.181	-2265,621	-2253.723
t cashflow	-147 473	-181.091	115 700			===
ugulated net cashflow	-1915.170	7101.071	-142.398	-139.639	-136.036	-171.707
	71719.470	-2094,252	-2236.659	-2376,298	-25:2,374	-2643.607

Haiti-Buik Blend-Simple Plant-1.5:1 --- August 30, 199



			CONFAR C.:		CHAL FERTILITE	R DEV. CENT	ER. ALABA
Cashflow tabl	es, produ	action in	Thousands of US 2	Gllars			
EST	2002	788 <b>2</b>	175e				
otal cash unflow	2710.301	2750.425	2507.197				
Financial resources . Sales, net of tab	5.755	4.324	7,954				
Sales, het of tax	2704.575	2755.104	2803,244				
otal cash outflow			[578.671				
Total assets	25.324	19.525	;e,^;;				
Operating costs	1211.541	2663.430	7910, 274				
Cost of finance	3.129	2,227	1 151				
Repayment	5.005	4, 904	7 515				
Corporate tak	2.666	9 6 7 7 6 6 6 6 6	7.77± 5.050				
Lividance caid	0.000 0.000	5.000 5.505	* ***				
	No GG 3	U. 000	0.090				
uralus ( deficit ) . uqulates cash balance	-135,435	-174 444	.170 277				
umulaten mash malamma	_7047 F1	_0375_557	್ಕವಾಗಾದಿರ <b>ು</b> ಕ್ರಾಗ್ರಹಕ್ಕ				
aflow, local	2705 127	07F4 170	1847 777				
thelms (most	705 171	-1351607	22,00,00				
ertue l'action	722,0,0	401.01/	427.272				
naids ( Esticit	22/7.51	2515.142	2765.E-1				
riga, toreign	5.042	3.7E7	3.464				
Cflow, foreign	2420.321	2460.692	9506,275				
flow, foreign	-1415, IEC	-1456.903	-2497.475				
Eulaced ret castilox	-101.505 -0770.171		-121.699 -3014.399				
ammento (el Cashilla	12.0.1/1	-1591.698	-3014.395				

masti-Bulk Bland-Biddle Flant-1,5:1 --- August 30,



***************************************	CAMPAR 2.1	- INTERNATIONAL	FERTILIZER DEV	UHILUU AKSRA IA
Cashflow Discounting:				 THE TENED
a) Equity paid versus Net income flow: Net present value1029.06 ac Internal Rate of Return (IRRE):not found	15 At 5			
b) Net Worth versus Net cash return:  Net present value	15.00 %			
Net present value1558.32 at Internal Rate of Return ( 138 )12,22 % Net Worth = Equity paid plus reserves	15.00 %			

Haiti-Bulk Blend-Sipple Plant-1.5:1 --- August 30, 35



	***********	ESMFAS 2.1	: - INTERNATIONAL	AL FERTILITER DEV.	. CENTER, ALABAMA
Net Income Statement is	Thousands of	US Bollars			•
Year	1992	:333	1998	:395	:eòr
Total salas, Incl. sales tax Less: variable costs, incl. sales tax.	627.389	986.769	1265.747	1601.973	1730.156
	639.274	1001.717	1283.246	1617.964	1742.073
Variable darges	-11.835	-14.955	-17.297	-15.884	-11.913
	-1.694	-1.51&	-1.366	-0.772	-0.639
Non-variable costs, incl. depreciation	119,695	119.829	118.941	119,094	119.227
Coerational margin	-130.530	-133.766	-13 <b>5.</b> 257	-134.780	-131.145
	-20.313	-13.553	-10.753	-3.426	-7.530
Cost of finance	50.921	49.318	45.439	<b>{2.12</b> 9	38.322
Gross profit	-181.400	-122.103	-181.694	-177.108	-167.467
	0.000	0.000	0.000	0.000	0.000
	-131.400	-132.103	-:81.696	-177.108	-167.467
	0.000	0.000	0.000	0.000	0.000
Net profit	-161.400	-182.103	-121.676	-177.132	-159.467
Bividends gaic	9.090	0.000	0.000	0.000	9.009
	-121.490	-152,103	-181.676	-177.108	-18 <b>9.46</b> 7
	-121.400	-353,504	-545.200	-722.003	-891.775
Gross profit, % of total sales Net crofit, % of total sales ROE, Net profit. % of equity	-28.914	-18.462	-14.553	-11.75	49.795
	-29.914	-18.462	-14.553	-11.75	49.795
	-53.561	-53.747	-53.629	-52,275	450.619
	-15.752	-14.493	-13.669	-12.453	411.735

Haiti-Bulk Blend-Simple Plant-1.5:1 --- August 20, <u>1</u>99



		IIMFAR 1.	: - INTERNATION	AL FERTILIZER DET	I. CENTER: SI SPANS
Net Income Statement	ls Thousands c	f US Collars			The second second
Year	1397	:46 <b>6</b>	. 55 <b>5</b>	2000	6334
Total sales, incl. sales tax	1984.718	2020, 27. 2020, 27.	2159.179 2154.184	23:3.204 23:4:49	2001 2437, 368 2433, 905
Variable eargin As I of total sales	-12.935 -0.691	-13.955 -0.690	4,925 -0.591	-!5.966 -0.691	-16.837 -0.691
_		119.493	117.626	119.750	:19.392
Operational eargin	-7.048	-133.447 -5.601	-104.610 -6.206		-135.725 -5.510
Cost of finance		28.910	25.970	22.:52	
Sross profit Allowances Taxable prefit Tax  Vet profit	0.000 -145.279 0.000	-182.357 0.000 -182.357 0.000	-180,581 0,000 -180,581 0,000	-!57,686 0.000 -!57,686 0.000	-150.719 0.000 -150.719 0.000
Net profit		-142.057	-150.551	-157.886	-150.719
	-1058.014	0,000 -152,357 -1220,371	0.060 -160.531 -1280.752	0.000 -157.895 -1533.838	0.000 -150.719 -1689.55S
Gross profit, I of total sales Net profit, I of total sales ROE, Net profit, I of equity ROE, Net profit-interest, I of invest.	-8.881	-9.031 -2.031 -47.921 -11.156	-7.403 -7.403 -47.396 -10.566	-6.234 -6.234 -46.601 -10.744	-5.124 -5.124 -44.424 -10.123

Raiti-Eulk Blend-Elople Plant-1.5:1 --- August 50, 199



		00%549 2.1	- INTERNATIONA	L FERTILIZER DEV	. CENTER, ALABAMA
Net Income Statement is	Thousands of	US Collars			
Year	2002	#147 2000	2004	2005	<b>199</b> 6
Total sales, incl. sales tax	2547.854	2633.963	2704.575	2754.104	2503.244
	2564.618	2654.177	2723.236	2775.125	2822.5 <b>6</b> 8
Variable margin	-17.565	-18.214	-13.661	-19.021	-19.324
	053.6-	-).69!	-0.670	-0.850	-0.689
Non-variable costs. incl. depreciation	.20.025	120.157	120.291	120.424	120.471
Operational margin	-137.599	-138,371	-13 <b>8.7</b> 52	-139.445	-139.795
	-5.402	-3,249	-5.138	-5.060	-4.587
Cost of finance	4.593	3.911	3.128	2.227	1.191
Gross profit	-:42.153	-142.293	-142.080	-141.673	-140.987
	0.000	0.000	0.000	0.000	0.000
	-142.182	-142.283	-142.080	-141.673	-140.987
	0.000	0.000	0.000	0.000	0.000
Net profit	-142.182	-142.283	-142.080	-141.673	-:40.787
Dividends caid	0.000	0.000	0.000	0.000	0.000
	-142.182	-142.283	-142.050	-141.573	-140.987
	-1831.740	-1974.023	-2116.103	-2257.775	-2398.782
Gross profit. I of total sales Net profit, I of total sales ROE, Net profit, I of equity ROI, Net profit interest, I of invest.	-5.582	-5.398	-5.253	-5.140	-5.029
	-5.582	-5.399	-5.253	-5.140	-5.029
	-41.965	-41.996	-41.936	-41.816	-41.613
	-5.793	-9.873	-9.777	-9.708	-7.638

Haiti-Bulk Blend-Binsle Flant-1.5:1 --- August 30. 199



		 INTERNATIONAL FERTILIZER DEV.	CENTER, ALABAMA
Projected Balance			•
Year	:001		
Total essets	677.884		
Fixed assets, net of depreciation Construction in progress	6.000 0.000 0.000 0.000		
Total liabilities	677.394		
Equity capital Reserves, retained profit Profit Long and sedius term deci Current liabilities Bank overdraft, finance required.	0.000 0.000 338.903		

339.080

49,950

Total debt ......

Equity, % of Hisbilities . . . .

Haiti-Bulk Blend-Simple Plant-1.2:1 --- August 30, 13



Projected Balance	Sheets,	Production	n in Thousands	of US Dollars	
			1994		1975
tal assets,	1041 445				
				1546.853	2027.377
xed assets, met of depreciation	647.494	518.971	590.315	551.526	532.604
nstruction in progress rrent assets	7.000	2.000	2.000	2.000	2.000
iient 255815	227.091	349.337			599.441
	3.461	7.472	3.515	5.246 6.660	3.557
sh, bank	0.000	0.000	0.000	0.000	0.000
55 Carried forward	0.000	0.000 131.400 192.103	363.504	545,200	722.308
55	181.400	192.103	181.675	177.108	167.467
tal liabilities	1061.445	1337.304	1585.559	1846.922	2029.377
cuity capital	338.803	238.563	338.603	03 <b>8.</b> 603	238.903
serves, retained profit	0.000	0.000	0.000	0.000	9.000
ofit	3.300	0.000 302.727	0.000 280.95 <b>9</b>	0.000	9.000
my and Sectua term debt	322.117	J02.927	290.95 <b>9</b>	155.469	225.295
rrent liabilities	56.037	36.209	109.701	:37.598	:47.937
		609.366	854.155	1115,017	:316.342
tal debt			1245.755		1690,574
mity, I of liabilities	31,919	25.335	21.369	:8.345	15.595
			Haiti-Bulk Blend	-Simple Flant-1.	5:1 A
	•	CSMFA	Haiti-Bulk Bland R 2.1 - INTERNAT	-Simple Flant-1.: IONAL FERTILIZER	5:1 A
rojected Balance	Sheets,	Production	Haiti-Bulk Blend R 2.1 - INTERNA n in Thousands	-Simple Flant-1.; IGNAL FERTILIZER of US Collars	Set A SEV, CENTER,
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A Sev. Genter, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT N in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance	Sheets,	Production 1998	Haiti-Bulk Bland R 2.1 - INTERNAT M in Thousands 1999	-Simple Flant-1.: FERTILIZER of US Pollars 2000	5:1 A: SEV. GENTER, 2001
rojected Balance  ar	Sheets, 1997 2214.708 503.550 2.000 647.605 3.565 0.000 291.775 185.009	25#FAI Production 1998 2598.388 2598.382 0.000 898.545 3.532 0.000 1958.014 60.387	Haiti-Bulk Blans R 2.1 - INTERNAT R 2.1 - INTERNAT R 2.1 - INTERNAT R 2.1 - INTERNAT R 2.599	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2,000 235,779 0,000 1512,818 150,719
rojected Balance  ar	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  ar	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
al assets	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  and assets and of depreciation istruction in progress and assets and a	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  ar	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  ar	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  all assets	Sheets, 1997 2214.738 503.550 2.000 647.603 0.869 0.000 991.778 186.539	2585A Production 1998 2398.888 474.080 0.000 578.540 0.592 0.600 1058.014 60.057	Haiti-Bulk Bland R 2.1 - INTERNAT R in Thousands 1999 2418.301 445.341 46.006 743.714 0.555 0.006 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A: SEV. CENTER, 2001 2758.765 -24,000 2.000 235,752 0.000 251,752 0.000 150,753
rojected Balance  ar	Sheets, 1997 2214.708 503.850 2.000 647.405 0.000 991.778 165.009 165.009 175.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000 177.000	258FAI Production 1998 2598.888  474.080 0.000 878.540 0.582 0.500 1058.014 60.057	Haiti-Bulk Blane R 2.1 - INTERNAT  in Thousands 1999  2618.301  445.341 46.000 748.714 0.595 6.300 1220.371 160.581	######################################	5:1 A:  SEV. CENTER,  2001 2758.765 -24,000 25,775 0,000 150.767 0758.768
rojected Balance  ar	Sheets, 1997 2214.708 503.850 2.000 647.805 3.569 0.000 951.778 165.009 2014.708 0000 0000 0000 0000 0000 0000 0000	258FAI Production 1998 2598.888  474.080 0.000 858.540 0.500 1058.004 60.057	Haiti-Bulk Blane R 2.1 - INTERNAT in Thousands 1999 2618.301 445.341 40.000 748.714 3.555 6.300 1220.371 160.581	-Simple Flant-1.3 -Simple Flan	5:1 A:  5:1 A:  5:1 A:  5:1 A:  5:0: 5:0: 5:0: 5:0: 5:0: 5:0: 5:0: 5:

- Garti-E.D. Elementucia Diamentuto) - --- August D. 🗗

## APPENDIX VII

COMFAR® Financial Tables for Optimum Plant Scenario
Using Currency Exchange Rate of H \$1.5 to US \$1.0



Haiti-Bulk Blend-Octimum Plant-1.5:1 August 29, 1990

Discounted Selling Price

I year(s) of construction, 15 years of production

currency conversion rates:

foreign currency 1 unit = 1.0000 units accounting currency local currency 1 unit = 0.6667 units accounting currency

accounting currency: Thousands of US Dollars

#### Total initial investment during construction phase

fixed assets:	899.15	81.180 % fareign
current assets:	0.00	0.000 1 foreign
total assets:	898.15	81.160 % foreign

#### Source of funds during construction phase

equity & grants:	448,94	81.133 % foreign
foreign loans:	364.24	-
local loans:	64.70	
total funds:	297.87	81.133 % foreign

### Cashflow from operations

Year:	1	6	15
operating costs:	669.53	1802.83	2655. <i>99</i>
depreciation :	41.42	42.09	43.16
interest :	67.34	44.98	1.19
production casts	778.29	1887.90	2700.34
thereof foreign	77.94 %	83.80 %	65.14 %
total sales :	627.39	1871.78	2803.24
gross income :	-150.90	-10.11	192.90
net income :	-150.90	-18.11	102.90
cash balance :	-437.57	-87.71	114.43
net cashflaw :	-348.12	1.74	123.56

Net Present Value at: 15.00 % = -1172.10

Internal Rate of Return: 2.10 % Return on equity!: -4.18 % Return on equity2: 0.19 %

### Index of Schedules produced by COMPAR

Total initial investment

Total investment curing production.
Total production costs
Total production costs

Working Capital requirements:

Cashflow Tables Projected Balance Net income statement Source of finance



			international	rentilizen De	A. CENIEK,	MLABARA
Total Initial Invest	ment is	Thousands of US Dollars				
Year	1991					
Fixed investment costs						
Land, site preparation, development	44.002					
Buildings and civil works	279.670					
Auxiliary and service facilities .	0.000					
Incorporated fixed assets	51.333					
Plant machinery and equipment	356.801					
Total fixed investment costs	731.607					
Pre-production capital expenditures.	166.339					
Net working capital	0.000					
Total initial investment costs	898.145					
Of it foreign, in 2	61.160					
		Haiti-Bu	lk Blend-Optia	uz Flant-1.5:1	#	lugust 29, 19



				•	2.1 UNIC
Tabal Company		COMFAR 2	1.1 - INTERNATIO	VAL FERTILIZER DEV	. CENTER, ALABAMA -
Total Current Invest					
Year	1992	1993	1994	1995	1995
Fixed investment costs					
Land. site preparation, development	6,650	0.000	6.666	4 44 4	
Buildings and civil works	0.000	0.000	0.000 0.000	9.009	9.000
Auxiliary and service facilities	0.00 <b>0</b>	0.000	9.000	9.00 <b>0</b>	0.000
incorporated fixed assets	0.000	0.000 0.000 7.600	0.000	0.000	0.000
Plant, machinery and equipment	0.000		وزورا وال	5.555	0.000
		2.000	2.000	2.000	2.000
Total fixed investment costs	2.000	2.000	1.000	2.600	2.000
Preproduction capitals expenditures.	0.000	0.000	0.666	5 555	
Morking capital	303.978	165 787	155 273	9.003 157.654	0.000
		1001007	176.010	150.066	30.543
Presneduction capitals expenditures. Norking capital	305.979	167.387	130.870	155.096	55.945
Of it fareign, I	86.065	89.522	98.573	89.394	89.176
•		Ha*	ti-Ruli Elend-San	· 5 ·	August 29, 1
				ežiumi i edriki kausi.	#25 <b>55</b> 1 29. 3
		 	t - Internation	elum Cempulieusi.	Hagasa 29, 1
-		COMPAG 2.	.1 - INTERNATION	AL FERTILIZER DEV.	AUGUSE 29, 1 CENTER, ALABAMA
Total Current Invest	nent is	COMPAG 2.	.1 - INTERNATION	AL FERTILIZER TEV.	AUGUST 29, 1 CENTER, ALABAMA
Total Current Investo	ment is	Thousands of US Doll	i - Internation ars	AL FERTILIZER SEV.	. CENTER, ALABAMA
Total Current Investo	ment is	Thousands of US Doll	i - Internation ars	AL FERTILIZER DEV. 2000	CENTER, ALABAMA
Total Current Investo  ear	nent is 1997	Thousands of US Doll 1998	i - INTERNATION Cars 1999	AL FERTILIZER SEV. 2000	CENTER, ALABAMA
Total Current Investo  ear	nent is 1997	Thousands of US Doll 1998	.1 - INTERNATION	AL FERTILIZER SEV. 2000 0.000	CENTER, ALABAMA
Total Current Investo  ear	nent is 1997 0.090 0.000	COMFAR 2. Thousands of US Doll 1998 0.000 0.000	.1 - INTERNATION lars 1999 0.000 9.000	AL FERTILIZER SEV. 2000 0.000	CENTER, ALABAMA 2001 0.000
Total Current Invests  ixed investment costs  Land, site preparation, development  Suidings and civil works  Auxiliary and service facilities	nent is 1997 0.090 0.000	COMFAR 2. Thousands of US Doll 1998 0.000 0.000	.1 - INTERNATION lars 1999 0.000 9.000	AL FERTILIZER SEV. 2000 0.000 0.000	CENTER, ALABAMA 2001 0.000 0.000
Total Current Investor  ixed investment costs  Land, site preparation, development  Suidings and civil works  Auxiliary and service facilities .  Incorporated fixed assets	nent is 1997 0.000 0.000 0.000 0.000	COMFAR 2. Thousands of US Doll 1998 0.000 0.000 0.000	.1 - INTERNATION lars	2000 2000 0.000 0.000 0.000	. CENTER, ALABAMA 2001 0.000 0.000 0.000
Total Current Invests  ear	0.090 0.090 0.000 0.000 0.000 0.000 2.000	7.000 COMFAR 2. Thousands of US Doll 1998 0.000 0.000 0.000 0.000 2.000 2.000	.1 - INTERNATION lars	2000 2000 0.000 0.000 0.000 0.000 1.000	CENTER, ALABAMA 2001 0.000 0.000
Total Current Investor  ear	0.000 0.000 0.000 0.000 0.000 2.000	COMFAR 2. Thousands of US Doll 1998 0.000 0.000 0.000 0.000	.1 - INTERNATION lars 1999 0.000 0.000 0.000 40.000	2000 2000 0.000 0.000 0.000 0.000 2.000	0.300 0.300 0.000 0.000 0.000 0.000 2.000
Total Current Investor  Tear	0.090 0.090 0.090 0.090 0.000 2.000 2.000	7.000 COMFAR 2. Thousands of US Doll 1998  0.000 0.000 0.000 0.000 2.000	.1 - INTERNATION Lars	2000 2000 0.000 0.000 0.000 0.000 2.000	0.300 0.300 0.000 0.000 0.000 2.000 2.000
Total Current Investor  ear	0.090 0.090 0.090 0.090 0.000 2.000 2.000	7.000 COMFAR 2. Thousands of US Doll 1998  0.000 0.000 0.000 0.000 2.000	.1 - INTERNATION Lars	2000 2000 0.000 0.000 0.000 0.000 2.000	0.300 0.300 0.000 0.000 0.000 2.000 2.000
Total Current Investor  (ear	0.090 0.090 0.000 0.000 0.000 2.000 2.000 0.000 65.212	0.000 0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 88.965	.1 - INTERNATION  1999  0.000 0.000 0.000 40.000 40.000 0.000 67.929	2000 2000 0.000 0.000 0.000 0.000 1.000 2.000 64.917	0.300 0.300 0.000 0.000 0.000 2.000 2.000
Total Current Investor  ear	0.090 0.090 0.000 0.000 0.000 2.000 2.000 0.000 65.212	0.000 0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 88.965	.1 - INTERNATION  1999  0.000 0.000 0.000 40.000 40.000 0.000 67.929	2000 2000 0.000 0.000 0.000 0.000 1.000 2.000 64.917	0.300 0.300 0.000 0.000 0.000 2.000 2.000

Harti-Bulk Blenc-Spince Flant-1.5:1 --- August 29, 1990



		COMFAR 2.1	- INTERNATION	AL FERTILIZER DE	V. CENTER, ALABAMA
Total Current Investm	ent in	Thousands of US Dallar	\$		
Year	2002	2003	2004	2005	2006
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.600	6.656 0.500	0.000	9.000
Auxiliary and service facilities .	0.000	0.000	2.032	0.000	0.000
Incorporate: fixed assets	0.000	9 <b>.0</b> 00	0.000	0.000	0.000
Slant, aachinery and equipment	2.000	2.000	2.000	1.000	2.000
Total fixed investment costs	2.000	2.000	2.000	2.000	2.000
Preproduction capitals expenditures.	0.600	0,000	0.000	0.000	6.000
Working capital	50.612	40.942	31.572	13.719	21.685
Total current investment costs	52.612	42.942	33.572	25.718	23.689
Of it foreign. I	88.821	29.723	E <b>9.</b> 070	89.287	69.357

Harti-Bulk Blesz-Gotisus Plant-1.5:1 --- August 29, 19



		COMFAR 2	.i - INTERNATIONA	L FERTILIZER :	dev. Center, Alabama
Total Production Co	sts in The	usands of US Bollars			
Year	1992	1993	1774	:995	1996
I of mam. capacity (single product).	0.000	0.000	0.000	3.000	0.500
Man Baterial I	540,120	E45.405	1697. 492	- 44	1471 202
culti ida maitildis	37.073	52.331	74,578	74.751	102.334
Stilities	4.598	5.855	5.831	3.000	5.446
Energy	4,685	4,594	5,235	5 577	5.633
Labour, direct	21.085	4.594 21.837	77.471	5.523 53.121	2.033 23.388
Repair, maintenance	0.000	3,669	ĝ. <b>1</b> 21	3.000	0.000
Spares	2.633	2.633	2.877	3.000 2.833	2.833
Factory overneads		4.000	4.000	4.000	4.000
Factory costs	514.394	943_507	1100 027	:FAB FEE	1117 000
JURINIPUL GLIAG CLASLUGGS?	35. láti	55.138	55 172	75 :70	10.7.7.6 55.139
Indir. costs, sales and distribution Direct costs, sales and distribution	0.000	0.000	0.000	0.000	3 636 3 636
Indir. costs, sales and distribution Direct costs, sales and distribution Depreciation	0.000	2.000	1.000	0.000 0.783	0.000
Casraciation	41,470	£1 557	41 454	21 210	0.000 41 CEO
Financial costs	67.341	64.024	50.210	7.1917	50.779
otal production costs	778.293	::04.222	1354.980	1657.369	:765.798
Probe ere verb / sincts sussess :	* * * * * * * * * * * * * * * * * * * *			=======================================	
wate per bill ( alfigle product ) .	0.000	3.633	0 <b>.00</b> 0	5.000	0.000
Doats per unit ( single product )  F it foreign, t  F it variable.2	17.908	60.687	82.207	51.115	83.466
er ak veradditjä , , , , , , , , , , , , , , , , , , ,	/4.680	87.447	85.75 <del>1</del>	ē5.7ē:	89.748
Total lasgur	76.223	75.975	77.559	78.259	75.52ô

Haiti-Bulk Blend-Optimus Plant-1.5:1 --- August 29, 1990



Total Production Co	osts in The	musands of US Doll	ars		
eaf	1997	1958	1979	2000	2001
of nom. capacity (single product).	0.000	0.000	0.000	0.000	6.000
aw gaterial i	1591.771	1719.173	1944,674	1964.605	2072 460
ther raw materials	110.710	119,577	128 300	174 AZ1	1372.767
P:   i   1 A P	0.010				
ergy	5,755	5.653	010 4	6.131	10.717 4 986
mbour. direct	13.384	57 507	71 765	5. FCG	24.664
Mair. maintenance	0.000	4.550	27.393 0.000	- 11 - 11 - 11 - 11 - 11 - 11 - 11 - 1	0.000
leres	7 277	C 577	0.000 5 g57	7.000	2.833
nergy	4.000	4,000	2.635 4.636	2.000 4.000	2.633 4.000
actory costs	1747.694	1884.929	2020.102	2145.282	2265.485
ministrative overheads	55.138	55.173	55, 138	55, 178	55 179
dir. costs, sales and distribution	0.000	3,300	0.000	2,000	0.000
irect costs, sales and distribution	9,000	4.633	6.666	0.000	0.000
epreciation	42,085	45.716	42.751	40 484	47 417
irect costs, sales and distribution apreciation	44,978	73,707	J3.486	27.517	15.853
tal production costs	1007.075	2020.293	2151.977	2274,417	2780.093
ete see wash d abadindust 1			=======================================		
sts per unit ( single product )	0.000	0.000	0.000	9.000	0.000
it foreign, Z	£3.755	E4.0E3	B4.350	54.582	34.754
it variable, I	90.721	5642	92.369	90.040	93,791
otal labour	78.511	79.175	79.443	79.737	

Marti-Bulk Blend-Optious Plant-1.5:1 --- August 29, 1990



		CONFAR	2.1 - INTERNA	ATIONAL FERTILIZE	E DEV. CENTER, ALABAMA
Total Production Cos					•
Year	2002	2003	2004	2005	2006
I of now, capacity (single product).	0.000	0.000	0.000	0.000	AAA 6
haw material :	2165,989	2241.628	2297.954	2343.773	*****
Other raw materials	150, 650	:55.909			
Utilities	11.296	11.408	11.848	:63.015	
Energy	A. 335	6.411		12.027	
Labour, direct	25.093	25.279	6.470 25.422	6.515	4.000
Repair, maintenance	0.000	0.000		25.530	
Spares	2.000	2.022	0.000	0.000	0.000
Factory overheads	7.000	2.633	2.833	2.833	
		4.000	4.000	4.000	4.000
Factory costs			2510.495		
Administrative overheads	55 170	55.138			
Indir. costs, sales and distribution	0.000		55.138		
Direct costs, sales and distribution	0.000	0.000	0.009	0.000	0.000
Depreciation	0.000 A2 75A	0.000	0.003	0.000	
Financial costs		42.893	43.016	43.149	43.156
		3.911		2.227	1.191
Total production costs	2468.680	2549.803	2611.778	2658.209	2700.342
Factor and the second second				=======================================	
Lusts per unit i single traduct i	0_616	0.006	9.900	9.000	9.000
of it foreign, i	94 995	03 CDL	85.051	85.097	85.135
U' II variable, Z	94,505		94.552	94.971	
Total labour	80.251	30.417	80.550	80.668	
				7000	001100

Haiti-Bulk Blend-Optisia Plant-1.5:1 --- August 29, 1990



Net Working Capital in					
ear	1992	1993	1994	1995	1996
weragesdc cotc					
rrent assets &					
Accounts receivable 30 12.0	55.774	83.220	104.590	129.977	
Inventory and materials . 179 2.0	288.980	452.481	579.881	731.222	787.517
Energy 30 12.0	0.390	0.416	0.435	0.460	0.469
Saares 340 1.0	0.390 2.833	0.416 2.533	0.43 <b>6</b> 2.833	2.833	0.4 <b>6</b> 9 2. <b>8</b> 33
Work in progress 0	0.000	0.000	0.000	0.000	0.000
Finished products 2 150.0 ash in hand 15 24.0	7 770	5.548	6.973	8.665	9.255
ash in hand 15 24.0	3.461	5.548 3.492	6.973 3.516 678.231	3.546	3.557
stal current assets	755.178	547.591	678.231	<b>975.7</b> 04	743.093
errent liabilities and	£4 105		•		
counts payable 30 12.0	·		99.996		
et working capital	707.978	469.366	598.234	751.321	308.266
et working capital	303.978	165.787	129.870	153.026	56.945
sh working canital "topa"	Fo 1-3	41 557	74 847	93.257	101 77.
et working capital. local	TAREUT Die TTG	01.533 207 E-7	.2.80; 50: 253	TET 2.E 14.94:	701 304
ote: edc = sinimus davs of coverage : co		Hait:	-Bulk Slend-Optic - INTERNATIONAL		•
		Hait:	,		•
let Working Capital #	Thousands of US	Hait: CSMFAR 2.1 Sollars	- INTERNATIONAL		CENTER, ALASA
let Working Capital :	Thousands of US	Hait: CSMFAR 2.1 Sollars	- INTERNATIONAL	FERTILIZES DEV.	CENTER, ALASA
let Working Capital in	Thousands of US	Hait: CSMFAR 2.1 Sollars	- INTERNATIONAL	FERTILIZES DEV.	CENTER, ALASA
let Working Capital in ear	Thousands of US 1997	Hait: CSMFAR 2.1 Sollars 1998	- INTERNATIONAL	PERTILIZES BEV. 2000	CENTER, ALASA
let Working Capital in ear	Thousands of US 1997	Hait: CSMFAR 2.1 Sollars 1998	- INTERNATIONAL	PERTILIZES BEV. 2000	CENTER, ALASA
let Working Capital in ear	Thousands of US 1997 :50,036 :51,985	Hait: COMFAR 2.1 Sollars 1998	- INTERNATIONAL	FERTILIZES BEV. 2000 183.702 1051.498	2001 193.090
et Working Capital in ear	Thousands of US 1997 :50.036 :51.925 :0.450	Hait: CSMFAR 2.1 Dollars 1998 101.672 920.164 0.490	- INTERNATIONAL 1999 172.937 987.319 0.501	PERTILIZES DEV. 2000 183,702 1051,498 0.511	193.096 199.226 199.226
et Working Capital in iverage	Thousands of US 1997 :50,006 :51,985 :0,480 :2,870	Hait: CSMFAR 2.1 Sollars 1998 101.672 920.164 0.490 1.833	- INTERNATIGNAL 1799 170.937 987.319 0.501 1.833	PERTILIZES BEV. 2000 183.702 1051.498 0.511 2.837	193.396 199.226 199.226 2.936
let Working Capital (a ear	Thousands of US 1997 850,236 851,925 0,460 2,877 0,960	Hait: COMFAR 2.1 Dollars 1998 isl.672 920.164 0.490 1.833 6.660	- INTERNATIONAL 1799 172.937 927.319 0.501 2.823	7000 2000 183.702 1051.496 0.511 0.977 0.000	193.356 199.226 199.25 2.933
let Working Capital (a sear	Thousands of US 1997 850,036 851,985 0,480 2,877 0,990 10,016	Hait: COMFAR 2.1 Dollars 1998 isl.672 920.164 0.490 1.833 0.600 10.773	- INTERNATIONAL 172.937 927.319 0.501 2.823 0.000 11.529	7000 2000 183.702 1051.498 0.511 0.937 0.000 12.247	193.356 193.356 1109.224 3.552 2.933 3.000 12.392
let Working Capital in ear	Topusands of US 1997 1997 150,238 851,985 0,450 2,873 0,000 10,000	Hait: COMFAR 2.1 Dollars 1998 isl.672 920.164 0.490 1.833 0.000 10.773 7.532	- INTERNATIONAL 1799 172.937 927.319 0.501 2.823 0.000 11.529 3.555	PERTILIZES DEV.  2000  183.702 1051.498 0.511 2.837 0.000 12.247 3.807	193.396 193.396 1109.226 3.526 2.933 3.006 12.377
let Working Capital in ear	Thousands of US 1997 850,036 851,985 0,480 2,877 0,990 10,016	Hait: COMFAR 2.1 Dollars 1998 isl.672 920.164 0.490 1.833 0.000 10.773 7.532	- INTERNATIONAL 172.937 927.319 0.501 2.823 0.000 11.529 3.855	PERTILIZES DEV.  2000  183.702 1051.498 0.511 2.837 0.000 12.247 3.807	193.396 193.396 1109.226 3.526 2.933 3.006 12.377
Per Working Capital in Ser	Topusands of US 1997 250,238 851,925 0,450 2,873 0,000 10,016 7,889 0017,119	Hait: CSMFAR 2.1 Dollars 1998 id1.672 920.164 0.490 0.833 0.000 10.773 7.530 1099.510	- INTERNATIONAL 172.937 927.319 0.501 2.823 0.000 11.529 3.555 1178.703	183.702 1051.498 0.511 0.000 12.247 7.607 1254.798	193.396 193.396 1109.226 3.520 2.930 3.301 12.377 3.316
et Working Capital in ler	Topusands of US 1997 :50.008 :51.925 0.450 2.870 0.008 10.018 1.589 0019,119	Hait: CSMFAR 2.1 Follars 1998 101.671 920.144 0.490 1.833 0.000 10.773 7.532 1099.510	- INTERNATIONAL 1999 172.937 987.319 0.501 2.833 0.000 11.529 3.555 1178.713	183,702 1051,498 0.511 0.000 12,247 0.607 1234,788	2001 193.395 193.395 199.226 0.526 2.933 0.000 12.397 3.516 1321.475
et Working Capital in ear	Topusands of US 1997 :50.008 :51.925 0.450 2.870 0.008 10.018 1.589 0019,119	Hait: CSMFAR 2.1 Follars 1998 101.671 920.144 0.490 1.833 0.000 10.773 7.532 1099.510	- INTERNATIONAL 1999 172.937 987.319 0.501 2.833 0.000 11.529 3.555 1178.713	183,702 1051,498 0.511 0.000 12,247 0.607 1234,788	2001 193.395 193.395 199.226 0.526 2.933 0.000 12.397 3.516 1321.475
et Working Capital in ear	Topusands of US 1997 :50.008 :51.925 0.450 2.870 0.008 10.018 1.589 0019,119	Hait: CSMFAR 2.1 Follars 1998 101.671 920.144 0.490 1.833 0.000 10.773 7.532 1099.510	- INTERNATIONAL 1999 172.937 987.319 0.501 2.833 0.000 11.529 3.555 1178.713	183,702 1051,498 0.511 0.000 12,247 0.607 1234,788	2001 193.395 193.395 199.226 0.526 2.933 0.000 12.397 3.516 1321.475
let Working Capital in sear	Topusands of US 1997 :50.008 :50.008 :51.925 :0.450 :2.870 :0.008 :7.529 :0.7.119 :45.641	Hait: CSMFAR 2.1 Dollars 1998 101.671 920.144 0.490 10.773 0.000 10.773 7.532 1099.510 15777	- INTERNATIONAL  172.937 987.319 0.501 2.823 0.000 11.529 3.555 1178.713	183,702 1051,498 0.511 0.000 12,247 0.607 1254,007 1275,007	2001 193.393 193.393 199.224 0.523 2.933 0.000 12.397 3.516 1321.473 193.75
let Working Capital (a ear	Topusands of US 1997 :50.008 :50.008 :51.925 :0.450 :2.870 :0.008 :7.529 :0.7.119 :45.641	Hait: CSMFAR 2.1 Dollars 1998 101.671 920.144 0.490 10.773 0.000 10.773 7.532 1099.510 15777	- INTERNATIONAL  172.937 987.319 0.501 2.823 0.000 11.529 3.555 1178.713	183,702 1051,498 0.511 0.000 12,247 0.607 1234,788	2001 193.393 193.393 199.224 0.523 2.933 0.000 12.397 3.516 1321.473 193.75



		IN CAMA: [UMM]	. PERTILIZER GEV.	. LENIEN, ALABAMA
Thousands of US	Dollars			
2002	2003	2004	2005	2006
201.778 1159.261		1230.948	1254, 795	221.333 1275.839
2.933	2.633	2.833	0.543 2.833	0.546 2.803
13.452	13.904	14.254	14,516	
1381.460	1429.211	1466.019		3 <b>.65</b> 0 151 <b>3.957</b>
197.183			213.141	215.738
1164.297 50.612			:320.539 IJ.719	1302.219 21.490
145.461	150.2:5 107 <b>5.</b> 023	153.885 1102.925	135.640 1123.889	159.161 1143.657
	Thousands of US  2002  201.778 1159.261 0.525 2.833 0.000 13.452 3.628 1391.480 197.183  1184.297 50.612	Thousands of US Dellars  2002 2003  201.778 208.567 1159.261 1199.736 0.528 0.534 2.833 2.833 0.000 0.000 13.452 13.904 3.628 3.635 1381.460 1429.211 197.183 203.972 1164.297 1225.239 50.612 40.942	Thousands of US Dollers  2002 2003 2004  201.778 208.567 213.803 1159.761 1199.736 1230.948 0.525 0.534 0.529 2.833 2.833 0.000 0.000 0.000 13.452 13.904 14.554 3.635 3.635 3.641 1381.480 1429.211 1466.019  197.183 203.972 209.208  1184.297 1225.239 1256.511 50.612 40.942 31.572	2002     2003     2004     2005       201.778     208.567     213.603     217.776       1159.761     1199.736     1230.948     1154.796       0.525     0.534     0.529     0.543       2.633     2.833     2.833     2.833       0.000     0.000     0.000     0.000       13.452     13.904     14.254     14.516       3.628     3.635     3.641     3.648       1381.460     1429.211     1466.017     1472.670       197.183     203.972     209.208     213.141       1164.297     1225.239     1256.911     1280.539       50.612     40.942     31.572     13.719       145.361     150.215     153.885     153.440

Haiti-Bulk Bland-Cottous Flant-1.5:1 --- August 29, 1990



Source of	Finance,	construction	Thousands of US Bollars
Year	. 1991		
Equity, ordinary Equity, preference Subsidies, grants	0.000		
Loan B. foreign. Loan C. foreign Loan A. Iocal Loan B. local	364.236 0.000 0.000 0.000 84.701 0.000	•	
Total loan	. 448.937		
Current liabilitie Bank overdraft			
Total funds	. 393.145		·

Haiti-Bulk Blenc-Bottous Flanc-1.5:1 --- August 29, 19



Source of F	inance,	production	in Thousands	of US Dollars		
Year	:592	1993	1994	:995	1976	1997
duity, ordinary Guity, preference. ubsidies, grants .	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, foreign . Loan B, foreign . Loan C. foreign . Loan A, local Loan B, local	-17.929 0.000 1.000 -4.172 0.000 0.000	-20.630 0.000 0.000 -4.797 0.000	-23.725 0.639 0.639 -5.517 0.663 0.009	-27.284 0.000 0.000 -4.045 0.000 0.000	-21.378 0.000 0.000 -7.296 0.000 0.000	-36.063 0.000 0.000 -9.391 0.000 0.000
otal loan	-22.111	-25.428	-29.242	-33,628	-38.672	-44.473
orrest liabilities atk overdraft	51.199 437.573	27.426 289.115	21.376 207.457	25.787 202.28£	9.445 91.307	10,814 87,715
atal funda	466.661	271,113	201,565	194,045	52.386	54.655

Source of	Finance,	production is	Thousands	of US Dollars		·
Year	:=98	;; <del>;</del> ;0	2000	2001	2002	2003
Equity, ordinary Equity, preference. Subsidies, grants .	0.000	0.00 <b>0</b> 0.000 0.00 <b>0</b>	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, foreign Loan B. Foreign Loan C. Foreign Loan A. Local Loan B. Local Loan C. Local	0.000 0.000 <del>-9.549</del> 4.000	-47.719 38.000 1.000 -11.097 0.000 0.100	-54.877 -5.454 3.000 -12.761 0.000 0.000	-63.103 -3.549 0.000 -14.675 0.000 0.000	0.000 -4.54: 6.000 0.000 0.000 0.000	0.009 -5.222 0.000 0.000 0.000 0.000
Total loan	-51,144	-20.816	-71.072	-6:.733	-4.541	-5.222
Current liabilities Bank overdraft	11.438 19.961	11.264 68.272	10.785 59.718	7.684 42.576	8.595 -63.972	6.789 -31.677
lotal funos	17.:54	58.740	-1,569	-19,517	11120	-74,5:5

-sicu-Buly Bland-licinum Flact-1,5:1 --- August 19, 1990



	- CGMFA5 1.1 -	- INTERNATIONAL	FERTILIZER DEV.	CENTER,	ALABAMA	
Course of Ciares and attended						•

Haiti-Eulk Slead-Cottawa Flanc-1.5:1 --- August 19, 199



		COMPAR 2.1 - INTERNATIONAL PERTILIZER DEV. CENTER, ALABAMA
Cashflow Tab	les, constructio	n in Thousands of US Dollars
Year	:771	
Total cash inflow	597.874	
Financial resources . Sales, net of tax	977.974 0.000	
Total cash outflow	698.:45	
Total assets		
Inflow, local Surplus ( deficit ) Inflow, foreign Outflow, foreign Outflow, foreign	169.402 169.627 1.574 728.472 729.118	
Net cashflow	-864,475 -664,475	

Haiti-Bulk Slenc-Optimuz Flant-1.5:1 --- August 29, 1992



*			COMFAR 2.1	- INTERNATIONAL	FERTILIZER DES.	CENTER, ALABAMA
Cashflow tabl	es, produ	uction m	Thousands of US	Collars		
Year	1992	1993	1994	:995	1994	:997
Total cash inflow	578.539	1013.795	:287.319	1627.085	:779.400	1882.534
Figencial resources . Sales, net of tex	51.199 617.769	27.426 986.759	21.07) 1265.949	25.387 1a01.978	9.445 1733.15a	10.514 1971.781
fotal cash outflow	1115.152	1282.510	1495.775			
Total assets	669.532 67.541 25.111 0.000	25.428 0.000	:50,040 1255,085 60,210 29,240 0,000	0.000	68.390 1670.026 51.779 36.670 6.000 9,000	7 14.5 9 • 9 9 9
Surclus ( deficit ) . Supulated cash balance	-437,573 -437,544	-269.115 -716.959	-209.457 -915.416	-201.184 -1118.702		-97.715 -1297.723
inflow, local	223.137 4:2.597 47.855	TEE /CL	1268.542 260.789 1007.752 10.777 1235.987 -1217.210	1605.078 301.601 1703.097 22.287 1527.650 -1505.583	1418.016 8.278 1617.561	1553,282 9,501 1650,497
Net cashfigw Curulated net cashficw	-348.121 -1312.575	-179.663 -1392.289	-120.004 -1512.245	-112,534 -1625.099	-1.855 -1826.954	1.777 -1818.217

haiti-Bulk Blend-Optious Plant-1.Eri --- August 19, 199



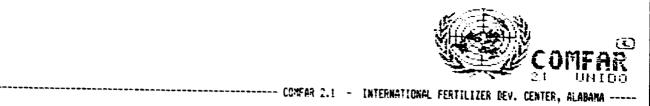
***************************************			COMFAR 2.1	- INTERNATIONAL	FERTILIZER DEV.	CENTER, ALABAMA
Cashflow tabl	es, prod	uction in	Thousands of US	Collars		
Year	1998	1999	2000	2001	2002	2003
Total cash inflow	2033.058	2218.443	2320.949	2446.752	2555.447	2642.752
Financial resources .	11.436	45.264	10.765	9.694	9.393	6.787
Sales, net of tax	2021.621	2169.179	2310.204	2437.068	2547.054	2635.963
otal cash outflow	2111.920	2286.735	2380.686	2487.288	2491.475	2561.673
Total assets	62.401	119.193	77.682	70.080	A1.005	49.731
Operating costs	1940.067	2075.240	2204.423		2421.337	2502.808
Cost of finance	3 <b>8.</b> 307	33.486	27.513	16,853	4.573	3.911
Repayment	51.144	58.614		81.733	4.541	5.222
Corporate tax	0.000	0.000		0.000	0.000	0.000
Dividends paid	0.000	0.000	0.000		0.000	9.000
urplus ( deficit ) .	-72.863	-68,599	-59.719	-27 571	£7 371	24 670
usulated cash balance		-1444.877	-1504.396	-1547.133	-1483.161	81.079 -:402.082
oflow, local	2023.011	2170.547 353.272 1817.275	2311.511	2439.244	2548.073	2636.787
utflow, local	336.578	353.272	758.551	381.776	37 <b>a.</b> 077	264.646
urplus ( deficit ) .	1686.012	1817.275	:942.960	2058.468	2171.997	2252.141
nflow, foreign utflow, foreign	10.047	47.378	9.458	8.507	7.373	2132.141 5.965
atflow, foreign	1774.922	1933.463	2012.137	2107.511	21:5.378	3.763 2177.027
urplus ( deficit ) .	-1764,875	-1885.567	-2002.679		+210 <b>6.</b> 025	-2171.062
et cashflow	10 589	-13.990	38.867	E/ 040	37 465	
imulated net cashilow	-1614.628	-1629.619	38.66/ -1589.751	56.049 -1533.703	73.105 -1480.598	90.213 -1370.3 <b>85</b>

Haiti-Bulk Blend-Optimus Plant-1.5:1 --- August 29, 1990



**********			COMFAR 1.1	- INTERNATIONA	L FERTILIZER	DEV. CENTER,	ALABAMA
Cashflow tabl	es, produ	uction in	Thousands of 15	Collars			
Year	2004	7005	2006				
Total cash inflow		2760.037					
Financial resources . Sales, net of tax	5.235 2794.575	7.933 27 <b>55.</b> 104	3.597 2693.244				
Total cash outflow	2613.575	2651.617	2672.412				
Total assets	3.125 6.006 0.000	2.217 6.905 0.000	1.191 7.942				
Sumplus ( deficit ) . Cumulated cash balance	96.235 -1305.847	108.419 -1197.428	114.426 -1082.599				
Inflow, local Cutflow, local Surplus ( deficit ' Inflow, foreign Outflow, foreign Surplus ( deficit )	2705.211 39:.006 2314.205 4.599 2221.569 -2217.969	2756.591	1803.481 460.637 2403.044 1.160 1191.775 -2298.615				
Net cashflow	105 349	117 553	107 540				

Hasts-Bulk Blend-Optiona Flast-1,5:1



Cashflow Discounting:

Haiti-Bolk Blend-Optious Plant-1.5:1 --- August 29, 1990



		20mFAR 2.1	- INTERNATIONAL	L FERTILIZER DEV.	CENTER, ALASAMA
Net Income Statement in	Thousands of	US Collars			
Year	1992	1993	1994	1995	1996
Total sales, incl. sales tax Less: variable costs, incl. sales tax.	627.389	985.369	1265.949	1691.978	1730.155
	581.227	910.340	1166.780	1471.422	1594.761
Variable sargin	46.162	76.029	99.169	130.554	145.394
	7.358	7.708	7.834	8.150	8.464
Mon-variable costs, incl. depreciation	129.725	117.858	129.991	130.124	130.257
Operational margin	-83.563	-53.829	-30.822	0.432	:5.137
	-13.319	-5.457	-2.435	0.627	0.875
Cost of finance	67.341	64.024	60.210	55.873	50.779
	-150.903	-117.852	-91.031	-55.092	-35.642
	0.000	0.000	0.000	0.000	0.000
	-150.903	-117.853	-91.031	-55.092	-35.642
	0.000	0.000	0.000	0.000	0.000
Net profet	-150.903	-117.853	-91.031	-55.392	-35.642
Dividends paid	0.000	0.000	0.000	0.000	0.000
	-150.703	-117.853	-91.031	-55.392	-35.642
	-150.703	-26 <b>3.75</b> 6	-3 <b>59.788</b>	-415.179	-450.621
Gross profit, I of total sales	-24.053	-11.548	-7.171	-7.456	-2.060
	-24.053	-11.548	-7.171	-7.458	-2.060
	-33.613	-25.252	-20.277	-12.336	-7.539
	-7.139	-4.024	-2.079	0.627	0.900

Harti-Bulk Blend-Optimum Plant-1.5:1 --- August 29, 1990



		COMFAR 2.1	- INTERNATIONA	NL FERTILIZER DEV	. CENTER, ALABAMA
Net Income Statementia	Thousands of	US Dollars			
Year	1997	1998	1999	2000	2001
Total sales, incl. sales tax Less: variable costs, incl. sales tax.	1714.527	1951.762	2169.179 1986.935	2116.115	2437.048 2230.318
Variable margin	157 754	169.859 8.402	122 244	194.089	294.750 9.401
Mon-variable costs, incl. depreciation	130.390	130.523	130.656	130.789	130.922
Operational margin	26.863 1.435	39.336 1.946	51.588 2.378	63.399 2.740	73.828 3.029
Cost of finance	44.978	35.307	33.486	27.513	16.853
Gross profit	0.000 -18.115	1.029 0.030 1.039	18.102 0.000 18.102	75.787 0.009 35.787 0.000	0.CC0
Net grofit	-:3.::5	1.029	18.102	25.787	55.975
Dividence paid	-18.115 -468.936	1.029 -467.908	0.000 18.102 -449.806	3.000 35.787 -414.619	56.975
Gross profit, I of total sales Net profit. I of total sales	-0.963 -4.635	ስ ለፍተ	0.935 0.635 4.032 2.675	1.549 1.549 7.971 3.172	2.338 2.338 12.691 3.591

Haiti-Bulk Blend-Springs Plant-1.5:1 --- August 29, 1990



Net Income Statement :					-
ear	2002	2003	2004	2005	2006
otal sales, incl. sales tax ess: variable costs, incl. sales tax.	2547.054 233.052	2635.963 2414.503	2704.575 2477.329	2756.164 2524.527	2803.244 2567.657
riable rargin	214.022 8.493	221.460 8.401	227.246 2.402		235.556 8.403
on-variable costs, incl. depreciation	:3:.055	171.198	:31.321	131.454	131.463
perational pargia	82.967 3.257	90.272 3.425	95,925 2,54?	100,122 3,630	104.093 3.713
	4.593	3.911	3.128	2.227	1.191
ress profit	78.374 0.000 75.374 0.039	85.340 0.000 95.340 0.000	92.796 0.000 92.796 0.000		102.902 0.000 102.902 0.000
et grofit	78.374	£6.750	92.796	97.875	102.902
widends paid	0.000 78.374 -278.669	0.000 86.360 -192.365	0.000 92.798 -99.513	6.000 97.895 -1.618	
ross profit, I of total sales	3.077 3.077 17.458 3.934	3.276 3.278 19.237 4.195	3.431 3.431 20.670 4.390		3.671 3.671 22.921 4.658

Haiti-Bulk Blend-Optimum Flant-1.5:1 --- August 29, 1990



***************************************		COMFAR 2.1 -	INTERNATIONAL FERTILIZER DEV	. CENTER, ALABAMA
Projected Balance	Sheets,	construction is	Thousands of US Dollars	
Year				
Total assets	893.145			
Fixed assets, net of depreciation Construction in progress	0.000			
Construction in progress	899,145			
Current assets	0.000			
Cash, bank	9,000			
LASS SUPDICE, incapre available	2 000			
Loss carried forward	9,000			
Lüss	0.000			
Total liabilities	298.145			
Equity capital	448.937			
neserves, retained profit	0.000			
fretit	0.000			
long and medius term debt	448,937			
Current liabilities	5.666			
Pank overdraft, finance required.	\$.271			
Total debt	449.208			
Equity. % of liabilities	49,985			

Haiti-Bulk Blend-Optiqua Plant-1.5:1 --- August 29, 1990



Year	1992	1993	1974	:995	1776	
Total assets	1754.876	1635.717	1937.534	2031.549	2093.629	
Fixed assets, met of depreciation Construction in progress Current assets	854.725	617.172	777.455	737.±38	697.714	
Construction in procress	2.000	2,600	2.000	# A#A	2.000	
Carrent assets	351.717	544,499	674.715	E73.158	939.537	
Casm. bank	3.461	2.492	3.5.5	3.546	7 667	
Cash surolus, finance available .	0.000	3.000	0.000	0.000	3.990	
loss carried forward	9,000	150,903	263.756	359.788	415.173	
Cash, bank	:53.903	117.853	51.031	55.352	35.642	
Total liabilities	1364.536	1675.919		2031.549	2093.629	
Equity cazital	448.937	448.937	21C C	110 077	448.937	
Reserves, retained profit Profit Long and redius tera deat Current liabilities	0.000	0.000	0.000	0.000	0.000	
Frafit	0.600	0.040	<b>0.</b> 000	9.000	0.000	
long and redius tera deat	426.825	401.398	371.154	338.528	299.855	
Current liebilities	51.199	78.616	è3°6ê6	125.732	104.827	
Bank overdraft, finance required.	437.845	706.959	916.416	1116.701	12:0.009	
Catal deat	915.369	1136.782	:393.569	1587.611	1644.692	
Equity, Nof liabilities	32.894	27.442	24,402	22.093	11.443	

Projected Balance	Sheets,	Production	n ia - Thousands	of US Collars	
Year	1997	1998	1977	ማለለ <i>ው</i> ድሃያሪ	2001
Total assets	2147.684	2:37.857	2263.680	2280.776	2372.351
Fixed assets, net of capreciation Construction in originals	657.629 2.000 1015.550 7.569 0.000 450.821 13.113	617.411 2.000 1,795.938 5.582 0.000 468.936 0.000	577.659 40.609 1175.119 3.595 9.600 467.908 0.000	574.575 2.000 1250.753 3.607 0.000 449.806 0.000	533.758 2.699 17:8.857 3.6:9 0.009 414.0:9 0.000
Total liabilities	2147.584	0187.86T	[] <del>[</del> ],:[]	1183.778	5373,455
Equity capital Reserves, retained profit Frofit Long and tedits term sect Current trasplittes Bank overdraft, finance required.	448,927 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000	443, 200 0, 000 1, 003 204, 008 187, 007 1776, 530	#28,377 / 2,172 / 2,172 / 257,722 / 168,772 / 174,878	##8.977 75.780 75.780 19.777 15.4.558	448.537 10.000 16.701 1.0018 16.701 16.701
Total dabt	1453,747	:::::::::::::::::::::::::::::::::::::::	.75	:***. <b>!</b> ]	**************************************
Emito, Celliannitae (Co.)	1.45		::.:::	19.15	::.*::



Projected Balance	Sheets,	Froduction	n ia - Thousands	s of US Dollars	
ear			2004		2004
ctal assets	2233.731				
and seach and at a					:033/8
1.23 assets, met of decreciation	493,209	452.325	411.309	370.159	779 661
metruction in progress	7.000	2,100	7,000	2.656	227.000
areu assets, met of decreciation controlled in progress	1377.852	1425.575	1462.377	1290 074	45.555
ass, bank ish Suralos, finance available iss carried forward	3.628	3.235	7 621	7 414	
ish surolus, finance available .	0.000	6, 666	0.001	9.076 4.566	3.653
ass carried forward	757.044	275 649	125 700	0.000	₹.390
55	0.000	0,000	171.307	99.513	:.5:3
		•	<b>3.4</b> 30	0.000	0.000
tal listilities	2203.731	2162.205	2071.636	1965.343	1551.576
Wity Capital  SErves, retained profit  Ofit  Talanc gedium term ment	448.937	442 937	## ATT		
serves, retaines profit	a, aaa	7.7 <b>0.</b> 707	778.JU/ 0.000	948.70/ A AAA	448.937
cfit	79 774	0.000 04 744	0.009	9.690	3.000
ng and medium term dept	76.077 94.077	86. Jeû	12.778	97.875	102.902
rrent liantinthas	137 167		14.649	7.542	0.000
3. Ougginadt forsons personn	.7/.150	20.7/1	209.208	213.141	216.728
ak overdraft, finance required.			1705.546	1197.417	1032.999
ai dest	1706.420	1a26.508	1529.903	1418.511	1299.737
uity, % of Irabilities					

Hast:-Bulk Blend-Optique Plant-1.5:1 --- August 19. 1990

### APPENDIX VIII

COMFAR® Financial Tables for Simple Plant Scenario

Using Currency Exchange Rate of H \$1.5 to US \$1.0

and Maximum (Nondiscounted) Selling Price



Haiti-Sulk Blend-Binale Plant-1.5:1 August 70, 1990 Maximum selling price

I year(s) of construction, 13 years of production

Currency conversion rates:

foreign currency 1 unit = local currency 1 unit =

1.0000 units accounting correct 0.6667 units accounting correct.

accounting currency: Indusants of US Oblians

# Total initial investment during construction phase

fixed		677.68	79.664 % foreign
current a		0.00	0.000 % forsion
total ;	essets:	577.58	79.564 % foreign

## Source of funds during construction phase

equity & grants: foreign loans :	339.80 259.48	79.598 1 foreiça
local loans:	69.12	
total funcs:	≥77.61	79.598 % forecen

## Cashflow from operations

Year:	1	6	15	
operating costs:	727,59	1973.02	2910.87	
depreciation :	30,37	31.05	32.17	
interest :	50,82	33.94	1.19	
areduction costs	808.79	2038.62	2944.23	
thereof fareign	78.11 %	83.85 7	65.12 %	
total sales :	695.06	2073.65	3105.59	
gross income : net income : cash belance : net cashfic# :	-113.73	35.64	141.36	
	-113.73	75.64	181.36	
	-276.54	-5.15	171.51	
	-209.03	60.35	180.65	

Net Present Value at: 15.00 % = -547.78 Internal Rate of Return: 6.65% Secura on equity1: 6.55 % Secura on equity2: 4.36 %

## Index of Schedules produced by CMFAP

Josef Contral Investment Total investment oursing production Total production costs converse Section costs

Cashflow Tables Projected Balance Net income stationing Sauris of filance



		 International	FERTILIZER DEV.	CENTER,	ALAEAMA
Total Initial Invest					
Year	1771				
Fixed investment costs Land. Site preparation, development Buildings and civil works Auxiliary and service facilities Incorporated fixed essets Plant machinery and ecuipment	205.003 0.000 15.667				
Total fixed investment costs	538.473				
Pre-production capital expenditures. Net working capital	139.411 0.000				
Total initial investment costs	677.854				
Of it foreign, in 2	77.644				
	·	 			

Mait:-Bulk Blend-Sigble Flant-1.5:1 --- August 30.



***************************************		F=4=12 A			al umia
		Life 2.	i - INTERNATION	MAL FERTILIZER DEV	und – den 1955 CENTER, ALABAMA
lotal Current Invest	ment in	Thausanis of 18 Itl.	ars		•
Year	1992	1553	1994	1955	1998
Fixed investment costs				-: -	¥ - + <del>U</del>
Land, site preparation, development	0.000	0.000	0.000	A 33A	
Euildings and civil works	9,000	<u>@</u> _356	6.656	A	0.000
Auxiliary and service facilities .	0.060	9.0 A AAA	5.550	C.000	0.000
ANGULDOLUCED LINEU BESSELS	A / AA	0.000	0.000	9.000	0.000
Place machinery and amplement	0.000 5.530	9.000	0.000	0.000	9.909
Plant, machinery and equipment	1.000		2.000	9.000 2.000	7:363 2:660 2:660
Total fixed investment costs	2.000	2.000	2.000	2.000	1.000
Prepreduction capitals expenditures. Working capital	4.0%	6 246	A.A.A.		
Working capital	471 2-6	5.690 	_0.000	0.000	0.000
				\$5.125	31.571
iotai current investment costs	176.515	34.107	73.721	§7.125	53.574
Of it foreign, I	33.879	89.275	88.357	99.170	
		Eg;	*:-\$010 B1		August CC, 19
		5.	er retu bitto - it.	The state of the s	
	- :	APUPAN B .	er term bien.s-sj:	dele FlantTi.Ull	August 60, 17
	·	CCMFAR 2.1	- INTERNATION	th FERTILIZER DEV.	CENTER, ALABAMA
Total Current Investm	ment _{in I}	CCMFAR 2.1 Scussands of US Colle	- INTERNATION	AL FERTILIZER DEV.	CENTER, ALASAMA
Year	ment _{in I}	CCMFAR 2.1 Scussands of US Colle	- INTERNATION	AL FERTILIZER DEV.	CENTER, ALABAMA
Year	ment in Ti 1997	CCMPAR 2.1 Mousands of US Dollar 1998	- INTERNATIONS	AL FERTILIZER DEV.	CENTER, ALABAMA
Year	ment in Ti 1997	CCMPAR 2.1 Mousands of US Dollar 1998	- INTERNATIONS	AL FERTILITER DEV. 2000	CENTER, ALABAMA
Year	ment in Ti 1997	CCMFAR 2.1 Mausands of US Doller 1998 0.000	rs 1779	AL FERTILITER DEV. 2000 0.000	CENTER, ALABAMA 2001 0.000
Year	ment in Ti 1997	CCMFAR 2.1 Mausands of US Doller 1998 0.000	rs 1779	AL FERTILIZER DEV. 2000 0.000 0.000	CENTER, ALABAMA 2001 0.000
Year	ment in Ti 1997 0.000 0.000 0.000	CCMFAR 2.1 Nousands of US Dollar 1998 0.000 0.000	- INTERNATIONS 1779 0.000 9.000	AL FERTILIZER DEV. 2000 0.000 0.000	2001 0.000 0.000
Year	ment in Ti 1997 0.000 0.000 0.000	CCMFAR 2.1 Nousands of US Dollar 1998 0.000 0.000	- INTERNATIONS 1779 0.000 9.000	2000 2000 0.000 0.000 0.000 0.000	2001 0.000 0.000 0.000 0.000
Year	######################################	CCMFAR 2.1 Nousands of US Dollar 1998 0.000 0.000	- INTERNATIONS 1779 0.000 9.000	2000 2000 0.000 0.000 0.000 0.000 0.000	2001 2001 0.000 0.000 0.000 0.000
Year	######################################	0.000 0.000 0.000 0.000 0.000 0.000 0.000	- INTERNATIONS 1779 0.000 0.000 0.000 0.000 40.000	2000 2000 0.000 0.000 0.000 0.000 2.000	200: 200: 0.000 0.000 0.000 0.000 2.000
Year	0.009 0.009 0.000 0.000 0.000 2.000 2.000	CCMFAR 2.1 Fousands of US Doller 1998 0.000 0.000 0.000 0.000 2.000	- INTERNATIONS 1779 0.000 0.000 0.000 0.000 40.000	2000 2000 0.000 0.000 0.000 0.000 0.000	2001 2001 0.000 0.000 0.000 0.000
Year	0.009 0.009 0.000 0.000 0.000 2.000 2.000	CCMFAR 2.1 Fousands of US Doller 1998 0.000 0.000 0.000 0.000 2.000	- INTERNATIONS 1779 0.000 0.000 0.000 0.000 40.000	2000 2000 0.000 0.000 0.000 0.000 2.000 2.000	200: 200: 0.000 0.000 0.000 0.000 2.000
Year	0.009 0.009 0.000 0.000 0.000 2.000 2.000	CCMFAR 2.1 Fousands of US Doller 1998 0.000 0.000 0.000 0.000 2.000	- INTERNATIONS 1779  0.000 0.000 0.000 0.000 40.000	2000 2000 0.000 0.000 0.000 0.000 2.000	200: 200: 0.000 0.000 0.000 0.000 2.000
Year	0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 33.299	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	- INTERNATIONS 1779  0.000 0.000 0.000 40.000 40.000 0.000 17.801	2000 2000 0.000 0.000 0.000 0.000 2.000	200: 200: 0.000 0.000 0.000 0.000 2.000
Year	0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 38.299	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	- INTERNATIONS 1779  0.000 0.000 0.000 40.000 40.000 0.000 17.801	2000 2000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 2.000	200: 0.000 0.000 0.000 0.000 0.000 2.000 2.000 12.458
Year	0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 38.299	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	- INTERNATIONS 1779  0.000 0.000 0.000 40.000 40.000 0.000 17.801	2000 2000 0.000 0.000 0.000 0.000 2.000 2.000 2.000 76.117	2001 0.000 0.000 0.000 0.000 2.000 2.000 2.000 32.498
Year	0.000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 38.299	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	- INTERNATIONS 1779  0.000 0.000 0.000 40.000 40.000 0.000 17.801	2000 2000 0.000 0.000 0.000 0.000 2.000 2.000 0.000 2.000	2001 0.000 0.000 0.000 0.000 2.000 2.000 2.000 32.498

1

Hasti-Bulk Blenc-Sizole Plant-1.5:1 --- August Ci, 199



			- ·· •-	AL FERTILIZER DE	EV. CENTER, ALABAM
Total Current Inves	tment in	Thousands of US Dolla	irs		
Year	202	100.	2034	509 <b>5</b>	2008
Fixed investment costs Land, site preparation, development Buildings and civil works Auxiliary and service facilities Incorporated fixed assets Plant, machinery and equipment	0.000 0.000 0.000 0.000 2.000		0.000 0.000 0.000 0.000 0.000	0.600 0.000 0.000 0.000 2.000	0,000 0,000 0,000 0,000 2,000
Total fixed investment costs	2.999	2.000	2.000	2.00	2,009
Preareduction capitals expanditures. Norking capital	0.000 29.188	0,600 21.784	0.000 17.559	0.000 13.201	0.000 12.070
Total current investment costs	30.16á	24.724	19.569	15.201	14.570
Of it foreign, 1	89.811	88.990	39.241	39.5%	59.718

Maiti-Bulk Blend-Sipple Flent-1.5:1



Total Production C	osts ia Tho	rancs of US Dollars	- INTERNATIONAL	FERTILIZER DEV	. CENTER, ALABAMA
Year	1952	1993	1554	199 <u>8</u>	1995
A of now. capacity (single product).  Naw saterial 1 Other raw gaterists Utilities Energy Labour, direct Repair, maintenance Spares Factory overheads  Factory cests	4.598 - 4.685 21.065 0.000 2.833 4.000	5.855 4.994 21.837 0.000 2.933 4.660	0.000 1200.164 74.929 6.331 5.235 22.421 0.000 2.833 4.000	0.000 1512.802 94.751 8.000 5.523 23.121 0.000 2.833	0.000 1628.604 102.334 3.448 5.633 23.388 0.000 2.833
Acainistrative overheads	55.138 0.000 0.000 30.350 50.821	\$5.138 0.000 9.000 30.525 43.313	55.138 0.000 0.000 30.556 45.439	165:.031 55:138 0.000 0.000 30:767 42:129	1775.240 55.138 0.000 0.000 30.522
,	575./10	1169.472	1447.646	1779.084	:200 400
Costs per unit ( single product ) . Of it foreign, %	0.000 73.114 79.041 76.223	0.000 £1.059 £5.595 76.975	0.000	0.000 83.319 90.938	0.000 93.571 91.706

Hait:-Bulk Blend-Simple Plant-1.5:1 --- August 70, 199



		COMFAR	2.1 - IMERNS	VIIONAL FERTILIZE	CEV. CENTER, ALABA
Total Production Co	stsia Thousa	ands of US Bollar	·\$		
Year	1997	1999	1959	I000	****
I of mea, capacity (single product).	0.000	9.639	A 336	0.000	
	1181 YTV	1902,552	2444 241 237	2174.659	A 163
Other raw waterials	110 710	119.573	471.710 • 70 750	41,4.627 135.641	
Itilities	1141117	9.465	125.000	125.641	144.145
Energy	0.744	9.465	7.580		19.914
	3./33	5.823	6.010		6.249
labour, direct	73.564	23.997	24,305	24.599	24.854
Repair, maintenance		0.000	0.000	0.000	3.000
gares	2.833	2.333	2.803	2.873	2.533
Factory overheads	4.000	4.000	4.000	4.000	4 555 Table
Factory costs	1917.883	2048 747		77FF 77;	
Administrative overheads	F5 !76	EE 175	-1111001	2007.000	2437.072 55.13E
fidir. Frata mains and dietely blan	00.108 A 663	44.145	35,138	35. :33	
Indir. costs, sales and distribution Direct casts, sales and distribution	0.000	0.000	0.000	0.000	
Jacobistis	0.000	0.000	0.000	0.383	0.000
Degraciation	31.055	31.163	71.321	31.454	31,597
Financial costs	33.744	13.510	25,970	0.000 31.454 22.162	15.770
Total production costs	2038.020	2:83.978	2717.760	24:3.091	2597,727
		=======================================		************	
Costs per unit ( single product ) . Of it foreign, %	0.000	0.000	0.600	6,400	6.666
It it foreign, %	83.865	84.175	£1 720	24 407	24 712
H it variable.%	92.478	93,005	\$7.7E+	01:20/ 01:20/	24.753
M it variable,%	78.877	79 : 75	13+144 75 4**	77.200	79.016 00.000
	, 5.511	11.100	17.770	Hist	80.0.2

Harti-Bulk Bland-Simple Plant-1.5:1 --- August 30. 1



		COMPA	? 2.1 - INTERNAT	IGMAL FERTILIZER	CEV. CENTER, ALABAMA -
Total Production C	ostsia Tha	usands of US Colla	irs		
Year				2005	2008
I of now. capacity (single product). Raw saterial : Other raw materials Utilities	0.000	6 655	A 636		
iam Saterial	2,27 675	0.000 586: 766	9.000	0.000	0.000
ther raw saterials	16771676	1931.307	2545.862	2554.371	2533.723
itilities .	196.539	122.464	159.967	123.615	145.704
TEFTY	11.11	11.403	11.848	12.677	10 :05
Throp rimes	6.335	6.411	6.470	£ ₹•₹	4 652
Rilities  Aergy  Abour, cirect  Boair, maintenance	25.693	25.279	25.422	25.570	ರಂತದಲ್ಲ ೧೯ :೧೮
epair, Asintenance	0.000	0.000	0.000	4 454	43.543 A 734
ares	2.833	2.833	±	3 577	0.500 2.533
	4.000	4.000	4.000	4.000	4.000
actory costs	757 754	5167 744	A351 447		***************************************
Mainistrative overheads	55 : 70	400/.J44 EE 470	2/36.403	2806.292	2835.735
dir. IGSts. sales and distribution	30.136	33.138	55.138	55.138	55.138
FECT COSTS. Sales and distribution	0.000	5.600	0.000	0.000	0.000
Preriation	0.000	_0.000	0.000	0.000	9.006
inancial costs	ol./20	31.853	31.986	32.119	37.144
			2.1.0	4441	1 197
otal production costs	2689.236	7778 CAA	2848.655	5955 33:	****
nete car unit f rivata anno 12 1	=======================================		::::::::::::::::::::::::::::::::::		=======================================
tit teering a stricts broduct )	0.000	0.000	0.600	2,263	1.644
lik turenging kan anan anan anan anan anan anan ana	54.900	84.985	85,646	85 089	3.00 <b>0</b>
osts per unit ( single product ) . Fit foreign, Z . Fit variable, Z	95.366	65,534	95.644	35 717	53.1.7 66 510
otal labour	20.231	90.417	80.560	50.668	Y3.635
		241 117	00.000	54.665	90.766

Halti-Bulk Blend-Sipple Plant-1.5:1 --- August 30, 199



				The same of the same of	់ ទីគម់! ខើ ). 23    បូក!
			- INTERNATIONAL	FERTILIZER DEV.	CINTER. ALABAMA
Net Working Capital in					,
Taar	1991		1994	1995	1775
Coverage taa cooo		_			
Current assets &					1
Accounts receivable 3) 12.0		90.800	114.195	142.151	151.572
Inventory and teterials . 90 4.0	159.193	249.232	319.342	402,555	*******
Energy	0.370	3.416	7 274	0.460	
Spares	2.837	2.233	0.40a 2.600	2.833	9.469 5.333
Work in progress	2.000 0.000	2.5cc 4.564	2.600	4.200	1.803
Finished manifel T 455 S		0.000	9.000	3.900	0.000
Finished products 2 180.6	4.042	5.654	7.820	7.479	19.169
[ash in hand 15 24.0	7.461	7,472	3.5:4	3,546	3, 557
Total current assets	200.551	752.519	212 622	551.154	
Current liabilities and	TOALCO!	-4676-7	551.J55	251.124	602.978
Accounts payable	T. 477			_	
••	55.037		199.701	137.536	147.977
Net warking casical	174 515	744 174	775 717	423.468	*FF A. •
increase in whether extring!	172 616	266.521 92.507	338.343 71.721	120.722	455.041
			faria.	555	31.574
Met working capital, local	29.453	I9.494	43,078	53.785	62,249
					•
Met working carried forgroe		276727 FFT +FT	751475		
Net working desital. Foreign Note: 5dc = firitum days of coverage ; coto	146.058 -= coefficient of	517.127	290.26E	365.083	392.71 <u>2</u>
Net working desital. Foreign Note: 5dc = firitum days of coverage ; coto	145.058	SS7.137 Cuntavan .	290.268	365.083 	392.711
Met working serital. foreign Note: ado = alaixum days of coverage ; coto	146.056	SIT.127 Lingever . Haiti-	290.268 	3 <b>65.</b> 083  - Flast-1.5:1	391.711
Net working decital, foreign  Note: add = alaimum days of coverage ; coto	145.055	557.197 Curnaver . Pastor 200548 2.1 -	290.268 	3 <b>65.</b> 083  - Flast-1.5:1	391.711
Net working cental, foreign  Note: edc = cirisus caus of coverage ; coto	146.056 = coefficient of decomposition	SST.127 Curdever . Faiti- COMFAR 2.1 -	290.268 Bulk Bland-Bingl INTERNATIONAL	Je5.083 	090.710 August 00. CENTER, ALASAMA
Net working cental, foreign  Note: sdc = minisum days of coverage ; coto	146.056 = coefficient of decomposition	SST.127 Curdever . Faiti- COMFAR 2.1 -	290.268 	3 <b>65.</b> 083  - Flast-1.5:1	392.712 August 30.
Net working cental, foreign  Note: edc = cirisus caus of coverage ; coto	146.056 = coefficient of decomposition	SST.127 Curdever . Faiti- COMFAR 2.1 -	290.268 Bulk Bland-Bingl INTERNATIONAL	Je5.083 	092.712 August 30. CENTER, ALASAXA -
Net working cental, foreign  Note: sdc = ministan cass of coverage ; coto  Net Working Capital in  Year	146.056 = coefficient of decree of d	SST.127 Curdever . Faiti- COMFAR 2.1 -	290.268 Bulk Bland-Bingl INTERNATIONAL	Je5.083 	392.712 August 30. CENTER, ALASAMA⊹
Note: sdc = minisum caus of coverage ; coto  Note: working Capital in Year	146.056 = coafficient of decident of decid	557.197 Cordever . 300568 2.1 - College 1998	290.268 Bulk Bland-Binol INTERNATIONAL 1999	JeS.CSJ 	092.712 August 30. CENTER, ALASAXA -
Note: sdc = minisum caus of coverage; coto  Note: working Capital in  Year	146.056  = cosfficient of decomposition	557.127 turdever . 2005AR 2.1 - lollars 1998	290.268 Bulk Bland-Bispl INTERNATIONAL 1999	JeS.CSJ	090.710  August CO. CENTER, ALASAMA - 2001
Net working cerital, foreign  Note: sdc = minisum days of coverage ; coto  Net Working Capital in  Year	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	092.712 August 30. CENTER, ALASAXA -
Net working cerital, foreign  Note: sdc = minisum days of coverage ; coto  Net Working Capital in  Year	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	CPILTIS  August CO.  CENTER, ALASAMA -  2001  211.851  510.445
Net working cerital, foreign  Note: sdc = minisum days of coverage ; coto  Net Working Capital in  Year	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	092.712 August CO. CENTER, ALASAMA - 2001 211.851 810.445 (.520
Net working cerital, foreign  Note: sdc = minisum days of coverage ; coto  Net Working Capital in  Year	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	392.712 August 20. GENTER, ALASAMA 2001 211.881 810.485 8.522
Net working cerital, foreign  Note: sdc = minisum days of coverage ; coto  Net Working Capital in  Year	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	CPILTES  THE AUGUST CO.  CENTER, ALASAMA  COCI  CILLES  COCI  CILLES  COCI  CILLES  COCI
Net Working Capital foreign  Net Working Capital in  Year  Coverage	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	292.712 August 20. CENTER, ALASAMA 200: 211.85: 210.465 0.822 0.822
Net Working Capital foreign  Net Working Capital in  Year  Coverage	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	090.710 August 00. CENTER, ALASAMA - 2001 200.485
Net Working Capital foreign  Net Working Capital in  Year  Coverage	145.055 = coafficient of decident of decid	207.127 Curdever . Factor 2005AR 2.1 - Collars 1998 176.390 506.400	290.268 	365.083 	CPOLTES  CENTER, ALASAMA  COCC  CITARS:  CITARS:
Net Working Capital foreign  Nate: sdc = ministan cass of coverage; coto  Net Working Capital in  Year  Coverage	145.055  = cosfficient of d  Tabusancs of US 1 1997  184.403 469.912 9.480 2.801 0.000 10.761 7.569 651.174	207.127 Cursever . Hasting 2.1 - 20%FAR 2.1 -	290.268 Bulk Bland-Bing! ENTERNATIONAL 1999 1999 1999 1999 1999 1999 1999 1999 1999 1999 1999	265.083	292.712  August 20.  CENTER, ALASAMA  2001  211.851 210.485 2.822 2.822 2.822 2.822 2.822 2.823 2.823 2.823 2.823 2.823
Net working decital, foreign  Note: sdc = minimum cass of coverage; coto  Net Working Capital in  Year  Coverage	145.055  = cosfficient of d  Tabusancs of US 1 1997  184.413 465.912 9.480 2.800 0.000 10.761 7.565 651.174 109.824	207.127  Cursever .  Fasci -  20%FAR 2.1 -  College  176.593 506.500 6.470 2.503 9.600 11.799 2.522 722.125	290.268 Bulk Sland-Elssi INTERNATIONAL 1999 189.372 543.382 6.301 2.533 3.000 12.625 752.318 184.773	3-5.083	290.712  August 20.  CENTER, ALASAMA  2001  211.851 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485
Net Working Capital foreign  Net Working Capital in  Year  Coverage	145.055  = cosfficient of d  Tabusancs of US 1 1997  184.413 465.912 9.480 2.800 0.000 10.761 7.565 651.174 109.824	207.127  Cursever .  Fasci -  20%FAR 2.1 -  College  176.593 506.500 6.470 2.503 9.600 11.799 2.522 722.125	290.268 Bulk Sland-Elssi INTERNATIONAL 1999 189.372 543.382 6.301 2.533 3.000 12.625 752.318 184.773	3-5.083	290.712  August 20.  CENTER, ALASAMA  2001  211.851 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485
Note: sdc = ministrate cases of coverage; coto  Note: sdc = ministrate cases of coverage; coto  Note: working Capital in  Year	145.055  = cosfficient of d  Tabusancs of US 1 1997  184.413 465.912 9.480 2.800 0.000 10.761 7.565 651.174 109.824	207.127  Cursever .  Fasci -  20%FAR 2.1 -  College  176.593 506.500 6.470 2.503 9.600 11.799 2.522 722.125	290.268 Bulk Sland-Elssi INTERNATIONAL 1999 189.372 543.382 6.301 2.533 3.000 12.625 752.318 184.773	3-5.083	290.712  August 20.  CENTER, ALASAMA  2001  211.851 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485
Net Working Capital foreign  Note: sdc = ministrate cass of coverage; coto  Net Working Capital in  Year  Soverage	145.055  = cosfficient of d  Tabusancs of US 1 1997  184.413 465.912 9.480 2.800 0.000 10.761 7.565 651.174 109.824	207.127  Cursever .  Fasci -  20%FAR 2.1 -  College  176.593 506.500 6.470 2.503 9.600 11.799 2.522 722.125	290.268 Bulk Sland-Elssi INTERNATIONAL 1999 189.372 543.382 6.301 2.533 3.000 12.625 752.318 184.773	3-5.083	290.712  August 20.  CENTER, ALASAMA  2001  211.851 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485 200.485

Notes not a horomon days on obverses a coup - coefficient of curnover .

:8.595 :14.615



Net Working Capital is	Thousands of 68	Sollars	•		CENTER, PLASERA
Year	#425 Y4	2900	2444	200 <b>5</b>	2006
Coverage					2115
Current assets t					
Spares	201.677 637.998 0.813 2.833	226.540 880.270 0.534 2.633	234.255 e77.445 0.539 2.833	278.619 690,369 0.540 0.880	4 # <u>* * * * * * * * * * * * * * * * * * </u>
IDLAI CUFFERT ARROYS	0.00) 14.738 3.626 850.802	01000 15.236 3.838 911.050	0.000 15.A20 5.c41 934.373	9,000 15,60 <b>3</b> 0,866	0.000 16.172 3.620
urrest liebilities and			229.703	751.896 204.024	967.922 237.978
let working capital	664.320 23.166	657.104 22.764			
et working casital, local et working casital, Foreign	97.419 576.902	90.147 595.957	92.257 612.420	97.834 624.940	78.18: 654.005

Haiti-Bulk Blend-Bisale Flant-1.3:1 --- August 71. 199



Source of F	inance,	construction in Chaisses of #8 Dallars
Year	1981	•
Eccity, andinary	JJE. 803	
Escrity, preference.	6.000	
Equity, ordinary Equity, preference. Subsidies, grants .	0.000	
Lean A, foreign .	249,483	
Loan B. foretan	6,600	
Loan B. foreign. Loan C. foreign . Loan A. local	0.000	
Laga A. Jergi	49 177	1
Loan B. local	A 555	
Loan C. local	0.030	
••	*****	
Total laan	338.863	
Current liabilities	4.434	· · · · · · · · · · · · · · · · · · ·
Baak cyararaft	0.277	
	7.277	
Total Alacs	577.884	

marti-Bulk Bland-Simple Flant-1.5:1 --- August 20, 3:



			COMFAR Z.	i - ENTERNATION	AL FERTILIZER DE	CENTER, ALABAMA -
Source of	Finance,	production in		of US Callers		
Year	1992	1993	1994	:595	1998	1997
Equity, ordinary Equity, preference. Subsidies, grants .	9.000 9.000 9.000	0.000 0.000 0.000	0.000 0.000 <b>0.</b> 000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, feraign . Loan B, foraign . Loan C, foraign . Loan A, local Loan B, local Loan C, local	-13.292 0.000 0.000 -3.404 0.000 0.000	-15.275 0.000 0.000 -3.915 0.000	-17.564 0.000 0.000 -4.502 0.000 0.000	-20.201 0.000 0.000 -5.178 0.000 0.000	-53.271 3.000 3.000 -5.954 6.000 0.000	-24.715 0.000 0.000 -6.349 0.000 0.000
Total Isan	-16.557	-19.190	-22.068	-25.378	-29.185	-33.ĉa3
Current liabilities Bank Gwerdraft	\$6.037 276.541	30.171 158.484	23.493 110.283	27.295 56.039	10.351 14.714	11.637 5.153
Total funds	715.891	159.467	:1:.703	EE.546	-‡.::3	-16.323

Heiti-Bulk Blend-Sizole Plant-1.5:1 --- August 30, 199

					2.0 1.20.0 7.00.1	wenter one
			COMFAR 2.1	- INTERNATIONA	L FERTILIZER DEV.	CENTER, ALABAMA
Source of	Finance,	production in		f US Sallers		
Year	:592	1999	200 <b>c</b>	2001	2002	2003
Equity, ordinary Equity, preference. Subsidies, grands .	0.606	0.900 9.000 9.00 <b>0</b>	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, foreign . Loan B. Foreign . Loan G. Foreign . Loan A. Local Loan E. Local Loan G. Local	-30,723 0,000 1,000 -7,875 0,960 0,000	-35.331 33.000 0.000 -7.656 0.000	-40.631 -3.434 0.600 -10.414 0.000 0.000	-46.725 -5.949 0.000 -11.976 0.000 0.100	0.000 -4.541 0.303 0.000 0.000	0.000 -5.202 0.000 0.003 0.003 0.000
Total loan	-73.579	75.787	-54.479	-32.33!	-4.541	-5.002
Surrent liesoloties Bank Guerdreft ,,,,	12.871 ~7.895	:2.731 -23.8:1	***.92% -00.***	10.645 -45.574	9.028 -129.546	7,460 -141,269
Total fings	-50,824	-14.517	-72,77		-12-,361	-1+1.618

restration Mand-Eurala Mant-1.5:1 --- August II. 1997



		COMPAR D.O COMPERANTICMAL FERTILIZER DEV. CENTER, ALASA
Finance.	production m	Trausanos of us Soliars
2004	SASE	2006
3.039	3.266	30
3 334	A 35A	1. 414
		****
0.000	5.500	WIN
0.000	a asa	LYX
_2 554	***** _4	- 1,744 - 1,742
2.00g		- T T-2 N-2
3.000	7.00	*
0.000	9. <b>0</b> 00	* ***
	0.000	
0.000	2000	5 55;
		******
-5.005	-2.5%	-7.FC
5 755	4 70,	7 (2)
		3,954 - 1,745
165.531	7.5.51	vec.
-155,097		-7.409
	2034 0.139 0.000 0.000 -6.005 0.000 0.000 -4.005 5.755 -156.037	Finance, production of 2004 2005 2005 2005 2000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 20000 20000 200000 20000 20000 20000 20000 20000 20000 20000 20000 200000 2000000

Parti-Bulk Bland-Bingle Plant-1.5:: --- August 30,



C=+ 4+		CCT-68 2.1 -	INTERMATIONAL PERFILITER DEV	. CENTER, ALASAMA
cashflow Tabl	es, constructi	On the Thousands of ES	lallers	· · · · · · · · · · · · · · · · · · ·
Year	1991			
Total cash inflor	a77.e07			
Pisancial resources . Sales, set of ta:	577.507 6.000			
Total cash outflow	677.884			
Total assets	0.000 55 •••			
Surplus ( deficit ) . Cunulated cash balance	-5.277 -5.277			
Inflow, local Sutflow, local Surplus ( deficit ) Inflow, foreign Surplus ( deficit )	137.889 0.389 532.743			
fet casafica	-652.477 -651.473			

Maiti-Bulk Blend-Sigole Plant-1.5:1 --- August 70. 199



			201548 0.:	- INTERNATIONAL	. FERTILIZER BEV.	CENTER, ALABAMA
Cashflow tabl	es, produ	action a	Thousands of LE	Iollars		
Year	1562	1993	15%	:555	:756	1997
Total cash inflor	751,077	1122.932	1405,990	1212.a45	1917.114	5015.051
Financial resources .	55.037	30.171 1092.7 <b>6</b> 0	27,497 140 <u>2,</u> 497	27,835 1774,781	:0.05: 1916.760	11.887 2073.664
Total cash cutflew	1027.608	1281.417	1536.077	:::::::::::::::::::::::::::::::::::::::	1941.830	2090.704
Total essets		124.278 1089.432 48.018 15.170 0.000 0.000	97.015 1071.051 65.607 22.065 0.000 0.000	115,010 1735,165 42,127 15,072 1,000	43,945 1830,376 78,322 29,185 9,000 0,000	50.174 1973.021 73.944 33.543 0.000 0.000
Sumplus ( deficit ) . Sumplus ( deficit ) .	-276.541 -276.618	-156.486 -455.394	-110.080 -545.587	-88.009 -881.818	-14.716 -546.341	-2.153 -651.472
Inflow, local	794, 115 115, 088 489, 029 48, 980 812, 580 -785, 571	1096.495 137.161 659.334 26.436 1044.256 -1017.620	1405.491 268.708 1236.664 20.568 1287.535 -1246.547	1773.249   012.295   1465.054   24.057   1573.750   41551.753	1918,104   120,502   1897,802   9,009   1821,323   9,612,718	2075.135 338.662 1738.473 10.418 1752.140 -1741.635
Wet cashflow	-209.004 -861.507	-90,978 -952,488	-42.774 -995.281	-18,572 010,790	52.79: +941,102	£2.751 £4,598-

hattimBulk Blasc-Sissia FlanthI.Eii --- August El



	*	00%744 0.1 .	- INTERNATIONAL	_ FEFTILIZER DEV.	CENTER. ALABAMA -
es, prod	uction a	Thousends of US Do	:llara		
:993	1959	9000 2000	eans Augus	2007	5567
2551.597	1457.511	2571,265	ನಡೆಗಿನ ಪ್ರಸ್ತಿ	**** ***	
12.572	EA. 387	11 572			7.514147
227.666	2503.139	11.524 2557.274 2547.274	19.645 2599.921	7.226 2521.769	7.463 2920.268
2211.338	5077 Asa 27008010	2541.076	1663,992	2701.220	2783.842
52,951	90.184	\$9.54°	15	75	
2:25.230 2:25.230	2272.467	774700 2444.475	49.241 2342.210	39,39 <u>7</u> 0450 ang	32.247
18.910 75.500	25.970	22.152	:3,590	-5J7 : 53†	7/42,452
92.273 1 101	44.357		82.65	~.341	9.711 5.22
0.000	0.000 0.000		0.000 0.000	9,866 6,356	9.000 9.000
7 249	20.511				9.030
-540.598	-623.085	10.131 -592.954	46.573 -546.380	129.845 -416.875	143.859 -272.956
2241,000					
757.574	77= CLC	100%.505 757 97/		577.514	2921.191
1930.548	5659 735	070,2,2 0120 FLO	408.504 5055 ##-	407.745	417.760
** 5.5	45.65)			415.116	2503.23:
1254 : =	2057.040	2147.304	7.01/ 2055 563	ā.084	6.540
-1875.849	-2009.190	-2107.401	-2246.1a:	2193.705 -2235.431	2365.703 -2359.363
75 204	55.016	*** ***			
-517.242	52.254 -773.373	195.772 ==63.601	120.014 -FZA 721	138.475	150.002 -248.765
_	2050, prode 1798 2050,007 12,572 2079,666 2044,008 2044,008 20,000 0,000 7,899 -640,598 2041,000 057,874 1805,665 -1875,849 75,406	25, production (a)  1998 1999  2553,137 2453,521  12,572 50,382 2539,666 2493,010  2244,338 2433,010  52,951 90,184 2123,580 2272,469 28,910 25,970 38,598 44,587 3,000 0,000  7,899 20,511 -643,598 -623,385  2241,020 2404,671 375,874 375,969 1893,565 2057,040 -1875,849 -5009,190  75,408 50,040	1998 1999 2000  2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 2000, 20	1998 1999 2000 2011  2053,127 2450,511 2571,208 2710,586  12.572 50.782 11.674 10.645 2239,666 2493,173 2559,774 2599,921  2244,038 2403,910 2541,076 2642,210 28.910 25.970 22.162 13.690 36.598 44,587 54,477 2542,210 28.910 25.970 22.162 13.990 36.598 44,587 54,477 62.651 3.090 0.000 0.000 0.000 0.000 0.000 0.000 7.599 20.511 30.131 46,577 -647,595 -633,385 -552,984 -546,782 2241,222 2404,671 2560,638 2701,229 2357,674 375,969 393,274 408,554 1830,548 2028,702 2147,562 2037,775 11.015 45,653 10,069 9.727 1896,665 2057,040 2147,500 2255,468 -1675,849 -5008,190 -2107,421 -2246,161	1998 1989 2000 2011 2002  2023,1377 1450,501 2571,208 2710,586 1850,995  12,572 50,581 11,674 10,645 9,208  2029,686 2403,173 2559,774 2599,921 1851,769  2044,038 2403,010 2541,076 1663,992 2701,449  52,951 90,184 49,961 45,141 79,792  2127,530 2272,463 2414,475 1642,210 2652,974  28,910 25,970 22,122 10,690 1,593  38,593 44,357 54,479 62,651 4,541  0,000 0,000 0,000 0,000 0,000  7,599 20,511 30,131 46,577 1,541  -487,598 -628,325 -592,954 -548,750 129,545  2241,000 2404,671 2560,638 2701,009 502,911  157,674 375,965 190,075 408,504 408,504 407,745  11,015 48,650 10,069 9,507 64,684  1295,465 2007,040 2147,800 2053,458 2097,705  -1675,849 -1009,190 -2107,421 -2246,161 -2235,621

daiti-Buis Pleni-Simple Plant-1.5:1 --- August 70, 199



			201549 2.1	- INTERNATIONAL	. FERTILITER C	EV. CENTER, 9	elabika
Cashflow tabl							
Year	2004	2005	INa				1
Total cash inflow	0002.038	3057.670	1107 500				
Financial resources . Sales, met of tes	5.735	4,324	7,934				1
tales, set it les	2776.153	3053.365	3 <b>105,2</b> 90				
Total cass outflow, .	2845,759	2892.089	2938.030				_
Total assets	25.324	19.525	18.623				
Goerating costs	2311.541	2863,430	2910,873				
Cost of Finance	₹.:28	1.127	1.15				
Repayrent	6.004	a.70£	7.542				1
Corporate tax	0.000	0.000	0.000				
Bividends sais	0.000	0.000	0.000				•
Surplus v deficit i . Cubulated cash balance							
Inflow, Ioral	2996,993	3053.901	3106.030				•
Cotflow, Issai	425.676	451.397	437.092				4
Surolus ( isficit ) .	2571.315	2522,504	2563.988				
Inflow, foreign	5.042	3.757	3.464				
Butfla∡, foreiça	2420.322	2450.892	2500.939				
Outflow, local	-2415.290	-2456.903	-2497.475				1
Net casifica	145.170	1741775	150.647				
Curulates het castilex	-87.275	91.000	271.247				

Haiti-Bulk Slend-Simple Flant-1.5:1 --- August 20. 8



---- COMPARIZ.: - INTERNATIONAL FERTILIZER DEV. CENTER, ALASAMA ----Cashflow Discounting:

al Equity said versus Net income flow:		
Net present value	-115.41 st 5.50 %	15.00 %
Net Worth versus Net cash return: Net present value	-573 25 ±÷	୬ <u>ଟ</u> ଶ୍ରୀକ
Internal Rate of Return (IRREZ)	1 24 7	42000 A

c) Internal Rate of Return on total investment:

Het present value ... -547.33 at 15.00 l
Internal Rate of Return ( IER ) .. 6.65 l
Set Worth = Equity paid plus reserves

Harti-Bulk Sleng-Simple Flant-1.5:1 --- August 30, 199



			: - INTERNALIONA	E FERTILIZER SEV.	CENTER, ALABA
Net Income Statement:	n Thousanis of	të Dallars			
Year	1592	1557	1255	1555	:596
Total sales, incl. sales tax Less: variable costs, incl. sales tax.	695.060 637.274	**************************************	1412,497	1774,781 1817.884	1916.763 1742.073
Variable sargin	55.765 6.026	91.400 8.067	01 <b>7.75</b> 1 3.500	156.278 E.840	.74.650 9.114
Mon-variable costs, incl. depreciation	118.695	::8.873	110,041	117.074	119.227
Operational sargir	-62.709 -9.051			77.804 2.170	55.463 2.874
Cost of finance	50.821	49.718	45.439	42.129	33.322
Gress profit	0.000 -113.730	-75,712 0,000 -75,711 0,000	-45.149 0.000 -45.149 0.000	-4.725 0.000 -4.325 0.000	17.141 6.003 17.141 9.000
let profit	-113.730	-7E.712	-45,149	-4.325	17.141
ividends paid	0,000 -113,730 -113,730	0.000 -73.711 -189.442	0.000 -4 <b>5.</b> 149 -23 <b>4.5</b> 90	0.000 -1.325 -233.715	0.000 17.141 -121.77\$
ross profit, % of total sales et profit.	-15.363 -16.363 -33.589 -7.589	-5.929 -5.929 -22.347 -2.948	-3.215 -3.219 -13.526 -0.629	-0.244 -0.244 -1.277 3.455	3,894 6,894 5,759 4,745

raiti-Bulk Blend-Birble Flant-1.5:1

--- A.;.:: II. IF



Statement is --- GOMEAN 2.1 - INTERNATIONAL FEBTILLIZER DEV. CENTER, ALABANA ----

Thousands of US Collers

Xe t

Income

		Service - Medic - Michael - Grapha - Franch - Charles			
STATE OF THE STATE	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	3.65 3.65 7.76 7.76 8	76.14.60 7.00 7.00 7.00 7.00 7.00 7.00 7.00 7	6.021 6.021 9.021	Gross profit, % of total sales Not profit, % of total sales
	4.1.4. 4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	73.379 0.000 73.379 -57.064	-130.448 -130.448	- 35 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Pavidends paid
91.61. 91.61. 91.62.	\$1.283 9.000 \$1.283 6.969	73.379 0.000 75.579 0.000	53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55 53.55	35.444 35.444 3.600 3.5444	Sross grafit  Situations  Taxable profit
126.124 4.671	113.446 4.433 22.162	59.350 4.134 25.970	54.597 3.777 26.910	59.569 3.356 33.944	Cost of finance
245.016 9.112 1119.992	733.264 9.112 115.759	218.975 9.112 119.626	234.050 9.113 19.483	136.948 9.112 119.350	Variable margin As % of total sales Non-variable costs, incl. depreciation
63 F 3 4- Gr 60 G 64 G 64 G 64 G 64 G 64 G 64 G 64 G 64	2005	P.3 L.3 104 de 604 de 184 de 184 de 184 de 185 de 1	2005, 576 2005, 576	6. (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Total sales, ircl. sales tax
				!!!	Phot



		COMEAS C.:	- INTERNATIONA	L FERTILIZER DEV	. CENTER, ALABAMA
Net Income Statement is	Thousanes of	dS Ballars			
Year	1002	# 12 m	1004	1974 1976	1706
Total sales, incl. sales tax	2021.759	2523.228	2995.220	3053.345	3:08.890
Less: variable costs, incl. sales tax.	2564.618	2653.27	2723.235	277 <b>5</b> .125	1822.868
Variable margin	257.150	246.071	273.044	273.240	283.021
	9.113	7.112	9.113	7.113	9.113
Mon-variable casts, incl. degreciation	:29.025	100.157	120.071	120.424	120.471
Operational margin	137.125	145,934	152.754	:57.6:7	132.551
	4.880	4,797	5.078	5.169	5.234
Cost of finance	4.593	3.711	3.:28	2.527	1.191
Gross profit	132.533	192,022	1 <b>47.6</b> 25	155.559	161.380
	0.000	0,000	0.000	0,000	0.000
	132.533	142,672	1 <b>47.6</b> 15	155.559	161.380
	0.000	0,000	0.000	0,000	0.000
Nat profit	:32.533	142.322	149.615	155.569	151.360
Dividends paid	0.000	0.003	0.000	0.000	0.000
	132.533	143.022	:49.515	155.589	151.360
	278.985	420.909	570.53-	716.124	257.463
Gross profit, % of total sales Net profit, % of total sales ROE, %et profit, % of equity	4.597	4.863	4,594	5.096	5.196
	4.697	4.863	4,994	5.096	5.196
	39.119	41.919	44,163	45.923	47.626
	9.960	10.412	10,749	10.987	11.237

Hasti-Bulk Blend-Simple Plant-1.5:1 --- August 30.1



			LATERNATIONAL PERFOLITER DEV. CENTER, ALABAMA
Projected Balance	Sheets,	construction is	The sames of Continue
Asst	1771	•	
Total assets	677.284		
Fixed assets, net of depreciation Construction in progress	677.854 0.000 0.000 0.000		
Total liabilities	677.384		
Equity capital Reserves, retained profit Profit Long and sedica term dest Current liabilities Bank overdraft, finance requires.	0.000 0.000		
Total debt			
Equity, 2 of liabilities			

Haiti-Bulk Stend-Strole Flant-1.5:1 --- August 20, 199



Projected Balance	Sheets,	Production	n in Tabusands	of US Collers	
est	1992	1597	1984	1775	1996
otal assets	993.775	1100,041	1274,949	1757,495	1074.513
ixed assets, net of degreciation	647.494	613.571	579.715	541.536	532.604
enstruction in progress	7,000	7,895	3.000	7.355	2.000
urrent assets	227.091	349.007	454,573	2,000 557,500	599.44:
855, 1856	7.451	7.492	7.5.5	3.546	3.557
ash surplus. Finance available .	0.000	0.600	6.600	0.200	0.000
oss carriec forward	3.000	113.773	:55 225	224.299	239.515
ü55	1.5.750	75.7:5	13.17	1 TOC 7:020	0.000
utal liatilities	993.775	1163.242	1274.949	1363.492	1374,519
quity casital	373.803	338.233	338.803	338.803	
eserves, ratainad profit	0.000	0.000	0.003	0.000	0.000
refit	2.00	0.000	0.000	0.000	17.141
ong and sedius tera cett	727,117	302.527	280.889	255.430	224.195
urrent liestlities	<b>55.</b> 037	36.202	109.701		147.937
ank overcraft, finance required.	276.315	435.704	5-5.58	531.520	46.542
otal cast	354.971	814.438	936.146	1024.672	1920.873
quity. % of liabilities	74.093	29.125	25.574	24,846	24.810

Projected Balance Sheets, Production is Transacts of US Dallars 597 1598 1999 2000 1001 1312,920 Total assets ...... 1073,435 1354.617 1057.750 1269.411 503.350 2.000 647.805 474.062 424,000 445.041 453.537 Fixed assets, has of depressation 2.000 693.543 2.000 40,000 2,000 Construction in progress .... 749.714 795.662 3.607 Current assets ....... 3,522 3,595 3.569 5.518 6.000 13**6.:**30 0.630 :33,447 5.000 0.000 0.000 Loss carries forkers ..... 221.774 57.084 0.000 0.000 0.000 0.000 1078.498 :Ta+.5. 1731,717 1712.573 1253,411 ...... ----------003.500 0.000 0.000 05.644 192.702 .... 115.3:7 DIS.807 5.600 77.77 77.77 186.773 477.763 Reserves, naternas promition . . . . ;;;;; ;;,;;; Profit .......... Long and red.un term dept . . . . . 10.1.15a 2.1.15a 545.359 Surrent liesilities . . . . . . . 46,51. 592,754 :51.-15 Sank oversnakt, forsnoe required. ·7' .:::: Total cest ......... 10 4.323 125.31 794,250 14,818 11.1.5 Equity, % or lightlicity ...... 1:.:57

Haitumikuk BienthBirole Plantmikist

------ COMPAR 2.1 - INTERNATIONAL FERTOLIZER DEV. CENTER, ALABAMA.



-3-100 balance	sneets.	Froduction	n ia Thousands	of ES Callers	C DEV. CENTER.
teer	2362		2563		2006
otal assets	1277,083	1277,477	:270.9:5	473	
Tives assets, set of depreciation destruction in progress	394.28: 2.000	764.478 2.500	334.442 5 888	364.323	274.157
esh, bank ash surplus, finance available css carried forward	0.000	0.000	0.000 0.000	48.672 0.000	220.126
ctal liabilities			9.500	9.009	0.000
mity repres		12:7.477	1270.815	1306.874	1464.265
uity capital serves, rataines profit ofit ng and medium tarm cabt rrent liabilities nk overdraft, finance required.	338.503 146.354 132.533 25.077 216.482 414.834	009.600 279.686 142.022 20.684 223.945 272.965	******	338,893 579,524 155,589 7,940 234,024 0,000	237.978
tal dest	559.393	517.765	341_470	511 313	0.000
ity, I of Hamilities	25.529	26,521	25.650	15,574	237.978 23.138

Halti-Bulk Bland-Sisple Flant-1.5:1 --- August 30, 185

# APPENDIX IX

COMFAR® Financial Tables for Optimum Plant Scenario

Using Currency Exchange Rate of H \$1.5 to US \$1.0

and Maximum (Nondiscounted) Selling Price



----- COMFAR 2.1 - INTERNATIONAL SERVILIZER DEV. CENTER, ALABAMA ----

Haiti-Bulk Blend-Dotinum Flant-1.5:1 August 29, 1990 Maximum selling orice

I year(s) of construction. It years of production

currency conversion rates:

foreign currency 1 unit = 1.0000 units accounting currency local currency 1 unit = 0.6667 units accounting currency accounting currency: Thousands of US Dollars

### Total initial investment survey construction phase

fixed assets:	£98.15	al.180 % fareiça
current assets:	0.00 2.00	0.000 % fareign
total assets:	698.15	81.160 % foreign

### Source of funds during construction phase

equity & grants:	448,54	81.175 % Haraion
foreign loans:	354,34	•
local loans:	34.70	
total funda :	897.87	91.137 % foreign

#### Cashflow from operations

Year:	:	ģ	:: 2635,77
operating costs:	£67.57	1802.50	2625,77
depreciation :		42.09	47.12
interest :		44.98	1,:5
production costs	773,19	1889.90	2700.74
thereof foreign	77, 54 %	87.80%	85.14 5
total sales :	575.0a	2075.65	1105.59
gross income :	-27.17	183.77	<b>4</b> 05.15
het income :	-::.::	193.77	<b>4</b> ,£,±£
cash balance :		114.17	416.73
rat rachilita			276 21

Net Present Value | at: | 15.10 % = | Internal Rate of Peturn: | 13.65 % | Raturn on equity1: | | 10.77 % | Raturn on equity2: | | 10.77 % | -:31.15

## Index of Schedules common VIVI

Castélia Papies Projectes Balance Total could a covernent Total investment during on fuction Total chockets on costs works to Daluta, requirements Nationable scatament Edunce of forance



			- :	INTERNATIONAL	FERTILIZER	Ξ¥.	CENTER,	ALAS AND	<del>,</del>
Total Initial Invest	iment :s	Thousands of US Idlians	•						
Year	1991								
Fixed investment costs									
iand, site preseration, development	44,002								
Buildings and civil works	277.670								
Auxiliary and service facilities .									
Incorporated fixed assets	51.333								
Plant sachinery and equipment	355.601								
•									
Total fixed investment costs	77.57								
Fre-production capital expenditures.	*41 770	•							
Net working capital		•							
Total initial investment costs	EP8.145								
Of it foreign is 1	81.180								

Haiti-Bulk Blent-Strikus Flant-iufit --- August 19. 19



otal Current Invest	weut it	andusands of US Dell	lars		
ear	1792	1993	1994	:355	1991
itad investment costs					
land, site precaration, tevelopsent	0.600	0.000	1. M3		3.337
Eucldings and civil works	9.030	C.500	A (A)	5 AAA	0.000
Auxiliary and service facilities .	0.000	0.000	5 mg 5		0.000
Incomporated files assets	6.6X	0.303	2.000	0.010	0.000
Flant, machinery and equipment	2.000	2.003	2.003	 	2.000
otal fixes investment costs	5,800	2.007	7 AAY	1.302	5.000
reproduction capitals expenditures.	0.000	3.00)	0.003	3 222	
arking capital	303.978	145.387	123.870	0.000 1 <b>57.</b> 18 <b>6</b>	0.000 <b>56.945</b>
otal current investment costs	305.978	157.187	:10.673	:55.054	55.945
f it foreign. 1	86.065	58.522	88.573	28,394	88.178

					- •
Total Current Investment	entis 😘	usands of US Col	ers		
Year	1997	1979	1999	# 5 % 5 ■ 9 5 9	2001
Fixed investment costs					
Land, site preparation, development Buildings and civil works	0.000 0.000 0.000 0.000	0.000 0.000 0.000 0.000 1.000	0.000 0.000 0.000 0.000 40.000	2,000 2,000 2,000 2,000 5,000	0.000 0.000 0.000 0.000 2.000
Total fixed covercent costs	2.033	2.000	\$4 505 50.000	1,000	2,555
Freoroduction oscitals expenditires. Working capital	0.000 55.010	3.000 £9.9£5	6,000 67,929	0.000 54.917	2.000 53.335
Total current investment costs	57,212	70.965	:77.929	:a.?:7	50,396
Of it foreign. T	88,731	93.719	92.589	33.777	28.767

maitinBulk Blanc-Cotopus Flant-1.5:1 --- August 29, 1980



		DIMFAR 1.:	- INTERBATION	EL FERTILITER DEV	. CENTER, ALKEANA
Total Current Investm	nent:: 18	cusards of US Dilla	irs		
Year	20/1	2003	1904	334 <b>5</b> 2.74	2018
Fided investment costs Land, site preparation, developme t	5 335 Secut	0.000	0.390	0.333	6.000
Euldings and civil works		0.000 0.000	0.000 0.000	0.000	0.000 0.000
Incomporated fixed assets	20 555 20 44 4 4 5 5 5 4 7 5 5	3.003 2.003 2.000	0.000 2.000	1 555 1 4 4 4 5 5 5 6 4 6 7 4 5	A TAMPA A CANADA MATERIAL AND A MATERIAL AND A MATE
Total Rased investment costs	2.193	AA 	1.0%		2.7.0
Preproduction capitals empanditures. Rocking capital	:.6% 53.6:1	0.000 40.747	0.000 0.000 0.000	7.305 27.715	0.000 21.659
Total current investment costs	51.8:1	<b>22.54</b> 2	33.572	15.718	13.639
Sf it foreign, '	6.21	53.928	<b>89.</b> 070	EF.227	\$9,357

Haiti-Bolk BlenchCoturus Flant-1.5:1 --- August CS,



					R DEV. CENTER, ALABAM
otal Production Co	osts in The	ousands of US Doll	ars		
er	1992	1993	1994	:995	1996
of now. capacity (single product).	0.000	0.000	0.000	3.000	₹.009
in Baterial :	540.120	845.408	1(31,455	1366.360	1271 727
Mar raw waterials	17.073	59.381	74.929	94.751	102.334
ilities	4,500	5.855	4 531	9.000	0 **0
ergy	4.695	4.794	E 975	5 CO	2.77
Prop Piperi	Ot ADS	*, ***	ne ya.	77	3.533 37.733
Sair saintepante	A 666	22.607 6.636	A AAA	10.121	1
sair, maintenance	0.000 7 E - 7	0.000 2.833	9 570	3.000 2.23 4.000	0.000
ctory avarbación	2.000 4.000	2.500 1.566	2.000	1.200	2.833
	4.000	4.000	4.000	4.000	4,000
ctory costs	514.394	943.507	1195.947	1504.589	16:7.576
ministrative overheads	55.138	55.178	55.173	FE +75	EE 173
dir. costs, sales and distribution	0.800	0.004	3.616	6.663	6.608
preciation	21,470	21 557	21 251	1. 5.5	3.000 3.000
preciation	87.341	64.024	50.210	55.623	50.779
ital production casts				:457.759	
	2761475		2003,75%	.2527	1745.798
ste man init / comin nerduct i	0.000	A AAA			
ాగా క్రామం అందింది. గ్రామం క్షామం క్షామం క్షామం క్షామం. - గాంగ్రామం క్షామం	5.000 	1.977	0,000	0.000	0.000
sts per unit ( single product ) it foreign, Z	17.736	20.85?	22,237	53,020	83 <b>.4</b> 86
il deligation	/4.68.	22,442	35.784	32.791	39.748
tal labour	7£.223	76.975	77.559	78,189	78,526

mastinBulk Elend-Optious Flant-1.5:1 --- August 29, 1990



***************************************		COMFAR 2.	.1 - INTERMATIG	NAL FERTILIZER DE	V. CENTER. ALABAMA -
Total Production Co	ostsia Tao	usancs of US Dollars			
Year	1997	1793	1999	2000	2001
I of now. capacity (single product). Raw material 1	0.000	0.000	2.000	0.000	0.000
Raw material 1	:591,771	1719,173	1944,674	1984,805	2677.489
Other raw materials	110.710	119.573	128.300	174.441	144, 145
Etilities	9,542	9.465	9,586	:0 477	10 012
ceray	5 755	5 997	A 316		2 0 1 A
about direct	57 444	27 227	91.75	5:10:	0.2°2
Censie Asiarenzone	0.700		A7:444 A 565	# <b>₹.</b> ⊌₹₹ 7.676	17.03* 1.141
repair , waither and the second second	V:003	0.000 8.500	V V	1.000	0.000
	4.600	1.800	2.500	ಪ್ರಕ್ರಿತ	1.201
Stilities Energy Labour, direct Repair, Maintenance Spares Factory overheads	4.000	4,000	₹.€₹₹	4.000	4.000
Factory costs Administrative overneeds Indir. Costs, sales and distribution Direct costs, sales and distribution Repreciation Financial costs	1747.654	1884.939	3020.102	7149.787	7745, 455
dzimistrativa overceads	55, 173	F5 172	55 179	EE +75	EE 175
edir. edsta. salas and mistribution	0.000	9 300	2.000	0.000	0.000
trant prete salas and dishrinkein-	2.425	<b>V</b> • • • • • • • • • • • • • • • • • • •	6.056	0.000	6.000
	7,000 ** 45	#0 5 · 5	0.070 15.751	0.000 15 454	9.000
Editesasian anno	7	70	*4J!	42.409	41.61/
'ibancia: costs	44,-75	id.ui/	J3.48t	./.5iå	15.550
otal production costs	:887.876	1020,591	2151.377	2274.417	2080.093
lasts per unit ( sincle product :	8.638	5,465	9,666	5.555	6 664
of it formion, t	47 TQR	<u>5≛</u> 6⊒9	04 750	28 500	51 7F1
Costs per unit ( single product ) . If it foreign, %	20.75	E1 735	02.170	57.002 57.040	97#/97 27 72*
er en fordoblige e e e e e e e e e e . Telet	774741 75 666	72,674	72,007	70.570	73./7.
iotai iagogi	3.322	77.155	77.445	17.131	<b>8</b> 0.002

Haiti-Bulk Blend-Cotizus Flant-1.5:1 --- August 29. 1990



		CSME/	45 2.1 - INTERN	ATIONAL FERTILIZER	DEV. CENTER, ALABA	MA
Total Production Co						
Year	2002	2003	200:	2005	2006	
I of mos. capacity (single product). Few material 1	0.000	0.000	0.000	6.644	÷ 066	
Few saterial !	2165,729	7741,679	7700 GFA	0.000 23 <b>4</b> 3.773	0.000 0.000	
Other raw materials	150.650	155,909	159,947	1.7 615	145 263	
Utilities	11.298	11.808	11.745	103.010	100.004	
Energy	£.335	5.411	5.470	, E-E	12,171 1 ese	
Labour, direct	25.093	55, 779	75 277	76 677	2:000 25:00	
Repair, maintenance	6,600	0.000	6.600	20.000 3.656	29.01C	
Spares	7.833	त केरह	9 277	5.000	0.000	
Other rad materials Utilities Energy Labour, direct Resair, maintenance Spares Factory overheads	4.000	4.000	4,000	4.000	4.000	
Factory costs	2744 190	7337 476	76+3 361	7257 151	8:41 554	
Administrative overheads	EE 175	010.15F2 55: 33	2019:978 EF 170	-00-074 FF -75	1500.654	
Indir. costs, sales and distribution	0.100	0.000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35	55.156	
Direct costs, sales and distribution	0.000	0.000	0.030 6.656	4 344	0.200	
Decreciation	30 7EA	9.000	0.000	9.000	0.000	
Financial costs	74.70V	71.503 7.511	93.018	42,147	40.158	
Factory costs	7.07.	3.7.1	3.116	2.22	1.191	
Total production costs	2465.623	5549, 867	251: 775	7,52 760	376A 735	
	=======================================	=======================================	**********	######################################	************	
Losts per unit ( single product ) .	0.000	0.000	0.006	3,593	0.060	
Of it foreign, 3	24.675	84.736	85.051	35.097	85, 135	
ut it variable, Z.,.,.,.,.,	94,505	94.701	74.352	94.971	95,007	
Costs per unit ( single product ) .  Of it foreign, %	80.231	<b>80.417</b>	89.550	80.558	81.756	

Hait:-Bulk Blend-Cottsus Flant-1.8:1 --- August 29, 1990



		SCMFAR 1.1	- INTERNATIONAL	L FERTILITER DEV.	. CENTER, ALABAMA -
Net Working Capital:	a Thousands of	la Dollars			
Year	1997	1993	1664	1795	1996
Coverage					
Current assets 1					
Accounts receivable IO 12.0	55.794	83.226	104.550	129.977	139.422
Inventory and materials . 179 2.0	199,983	452,481	579.582	771.222	767.5.7
Energy	0.070	0.416	3.438		3.417
	1.21	2.633	2.833	2.833	2,873
Aprila progress 0	1 713	0.030	2.003	J. 100	A 445
Finished products 2 180.0		5.548	3.773	5.665	
Cash in hand 15 24.0	0.111 1.46.	3.472	3.7.3	5.660	9.195
			3.5:4	I.54a	3.357
Total current assets	JEE. 17E	547.791	675.III	576.70€	940.090
Correst liabilities and					
Accounts payable	51.199	78.626	==.776	115.332	:74,527
			• • • • • • • • • • • • • • • • • • •		
Met working capital	303,478	409.700	575.238	751.021	518.Ies
increase on working capital	707, 278	155, 757	118.870	123.(8á	55,545
•		322.62			
Met applied regital, local,	\$2,27	51.553	78.807	F4.807	
Met warking dazital, foreign	141,115	407 F. T	521,429	526.515	705.470
The Heritany Constant State Constant		- W. J. W.	4612727	308.0.0	1VI.77V

Mote: Too = turidan dave of coverage : coto = coefficient of turnover .

- Rasti-Bulk Blant-Catraus Plant-1.Ext --- August 19. 19

Net Working Capital in Incusance of 88 Sollars 1997 1998 1995 Soverage ...... too cots Current assets & 150.208 351.985 0.480 0.800 1.000 1.000 12.977 987.719 9.501 193.085 1109.016 0.510 151.572 127,702 1051.478 920.184 -101.64 0.490 2.833 0.000 10.73 0.830 199.521 1.833 0.000 11.509 0.555 12,047 0,000 12,592 1,615 1711,475 11111111 Current liabilities and Accounts cavesia ( , , , , , , ) 10 (12.1) 145.641 157.077 1:1.711 :::.:: ------ - - - - - - - <u>-</u> 1177.655 Nati working tabital ( ) . . . . . . . . . . . . . Net workung debutau, uppa, .......... Net workung debutai, foreign ......... 100,211 100,515

Notas nos a nunción dels eficulitaçs a colo y lugarillo de lumbano y y la compositión y la colo de la colo de



		CCMFAR 2.1	- INTERNATIONAL	FERTILIZER DEV.	CENTER, ALABAMA
Net Working Capital in	Thousands of US	Callars			
Year	2001	2003	2004	2005	2008
Coverage sdc coto					
Current assets &					
Accounts receivable	201.778 1159.261 0.528 2.833 0.000 13.452 3.458 1381.483	3.615 1429.211	1233.948 0.533 2.633 3.000 14.254 3.641	3.645	0.546 2.833 0.000 14.756
Net working capital	1184,297 50.812	1225.239 40.542	1256.811 31.572	1380.529 23.719	1302,219 21,690
Net working capital, local Yet working capital, foreign	145.461 1933.836	150.215 1975.023	153.885 1102.926	156.640 1123.889	159,141 1143,057

Note: adc = ainious days of coverage : coto = coefficient of turnover .

haiti-Bulk Bland-Gotious Plant-1.5:1 --- August 29, 1990



****	***************************************	
Source of	Finance,	construction is Thousands of US Bollars
/ear	1971	•
Equity, ordinary Equity, preference. Subsidies, grants .	0.000	
Loan 3, foreign Loan 0, foreign . Loan A, local Loan 3, local	364.236 0.000 0.000 84.701 0.000 0.000	
Total loan	448.937	į
Current Hiabilities Sank overdraft		
Total funds	978.145	

Raiti-Bulk Blend-Optiqua Plant-1.5:1 --- August 29, 1994



				.i - internatio	MAL FERTILIZES LE	EV. CENTER, ALABAMA
Source of	Finance,	production	ia Tabusaads	of LS Dollars		
Yee:	1592	1993	1554	1995	1996	:097
Equity, andinary Equity, preference. Subsidies, grapts .	0.000	0.000 0.000 0.000	9.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, fereign Loan B, fereign Loan C, fereign Loan A, Iscal Loan P, Iscal Loan C, Iscal	0.030 0.000 -4.172	-20.630 0.000 0.000 -4.797 0.000 0.000	-23,725 0,000 0,000 -5,517 0,000 0,000	-27.224 0.000 0.000 -4.345 0.000 0.000	-31.376 (1.00) (1.00) -7.276 (1.00) (1.00)	-35.083 3.000 0.000 -8.351 0.660 0.000
Total loam	-27	-15.425	-29.242	-33.826	-36.672	-44,473
Current Habilities Bask overdraft		27.428 162.723	21.379 72.910	25.787 29.507	9, <b>445</b> -95,000	10.614 -114.159
Total Funds	398.990	151,755	e5.078	2:.26:	-:24.529	-:47.523

Hait:-Bulk Bland-Eptimus Flant-1.5:1 --- August 19, 1990

***************************************			COMFAR 2	.: - INTERNATIONAL	FEFTILIZER DEV	v. CENTER, ALABAMA
Source of	Finance,	production m	Thousands	of US Bollars		
Year	1998	1999	2000	200:	2462	2667 2663
Equity, ordinary Equity, preference, Subsidies, grants .  Loan A. foreign Loan S. foreign Loan S. foreign	0.000 6.000 6.000 -41.495 0.000 6.000	0.000 0.000 0.000 -47.719 58.000 0.000	0.000 0.000 0.000 -54.877 -3.434 0.000	0.900 0.900 0.900 -63.108 -3.549 0.900	0.009 0.009 0.009 0.000 -4.54: 0.000	0.000 0.000 0.000 0.000 -5.222 0.000
toan A. Israi Luan E. Israi Loan C. Israi	-7.647 3.000 0.000	-11.097 0.000 0.000	-12.76: 0.000 0.000	-14.675 0.090 0.000	0.000 0.000 0.000	0.600 0.600 0.600 0.600
Total loan	-51,:44	-20.816	-71,072	-81,733	-4,54;	-5.222
Current Histolicues Pank overdraft	11.438	11.284 -165.006	19.745 -120.989	9.65 <b>4</b> 0.000	<b>3.</b> 090 1 <b>.</b> 000	<b>5.769</b> 0.000
Total Aunda	-:73,89)	. FR 574	-181,295	+7 <b>1</b> ,649	7.33	1.567

Hassināu). Elenthistinum Alanthistichh (August 25, 199)



			COMPAR 2.1 - INTERNATIONAL FERTILIZER DEV. CENTER, ALABAMA
Source of	Finance,	production in	Thousands of US Dollars
tear	2004	2005	209 <b>6</b>
Equity, ordinary Equity, preference. Subsidies, grants .	0.000	0.000 0.000 0.000	0.000 0.000 0.000
Loan A, foreigncan B, foreigncan C, foreigncan A, localcan B, localcan C, local	-5.00 <b>5</b> 0.000 0.000 0.000	0.000 -6.508 0.000 0.000 0.000 0.000	0.600 -7.540 0.000 0.600 0.600 0.600
Total loan	-a.00 <b>6</b>	-o.5%	
Current liabilities Bank overdraft		3.933 0.000	3.597 0.660
Total funds	-0.776	-2.973	-4.748

raiti-Bulk Blens-Sptinus Flant-1.5:1 --- August 19, 1993



----- COMPAR 2.1 - INTERNATIONAL PERTILIZES DEV. CENTER, ALABAMA -----

Cashflow Table	es, construct:	ion in Thousands of 85 Dollars
Year	1991	
Total cash inflow	897.874	
Financial resources . Sales. met of ta:	<b>697.874</b> 0.000	
Total cash outflow		
Total assets	56 <b>4.</b> 475	
Operating costs	0.000	
Operating costs	33.670	
repavaent	0.000	
Composate tax	0.000	
Dividends paid	ð.66 <b>0</b>	
Surplus ( ceficit ) .	-0.371	
Dumulates cash balance	-0.271	
Inflow, Iscal	169.402	
Buiflag, Issa	149 027	
Surplus deficit: Inflow, foreign	0.374	
Inflow, foreign	723.471	
Betflaw, foreign	729.118	
Surplus ( seficit : .	-0.646	
Wet cashflow	-964,475	
luaulates set caenflow	-364,475	

Haiti-Bulk Slend-Octions Flant-1.5:0 --- Rugust 29, 1990



***************************************			COMPAR 1.1	- 3755743342	FERTILIZER DEV.	CENTER, ALABAMA		
Cashflow tables, production in Thousands of US Bollars								
Year	1992	1993	1974	1995	:976	1997		
Total cash caflow	745.259	1120.15	1423.867	1800.148	1926.208	2084.478		
Financial resources . Sales, net of tax		27.426 1092.760	21.370 1402.497	25.237 1774.761	9,445 1916.76J	19.614 2073.664		
Tetal cash cutflew	111512	1222,717	1476.776	1819.650	1830.907	1970,309		
Total assets	357.178 469.531 67.341 22.111	194.813 998.863 64.024 23.428	155,036 1755,035 60,240 19,241	•सम्बद्धः एतः,	1473.058	1591.601 44.973		
Repayment Componate tan Dividends baid	0.000 6.000	0.000 0.000	27.49. 2.000 0.000	0.000 0.000	0.000 0.000 0.000	44.473 0.000 0.000		
Surgius I deficit : . Cusulated cash balance	-3 <b>65.</b> 902 -370.173	-152,720 -531,697	-72.716 -a05.817	-19.502 -603.309	25.704 25.704 5.70,002	114.119 -415.34)		
Inflow, local	703,465 223,137 480,268 42,855 891,355	1051,052 1051,075 1011,075 1018,105	1405.059 150.039 1497.000 12.777 1235.987 -1207.200	1777.88: 701.890 147a.081 601.860 -1505.583	1.12 472	2074,977   719,812   1755,165   9,501   1659,457		
Surplus ( deficit ;	-850,170 -180,450 -1,44,925	-1014.140 -77.171 -1118.197	-1017,210 16,542 -1001,655	-1505,553 59,949 -0141,708	-1519.323 -154.752 -956.954	-1640.997 • 100.610 -751.001		

maiti-Bulk Bland-Cotiau€ Flant-1.5:1 --- August 19, 19



*******************							
Cashflow tabl	es, produ	uction is	Thousands of US	Dollars			
ear		1966	1000		2362		
otal cash inflor	2251,122	2452.403	2575.139	2719.605	1830.161	2527.357	
Financial resources .	::.+]6	49.254	10.745			. 770	
financial resources . Bales, set of tax	1139.666	2403.139	1559.374	1679.711	2321.769	2920.26 <b>5</b>	
otal cash outflow			2780.568		2491.475		
Total assets	92,491	119.167	77.651	73,690	Le Aje	12 77-	
Carating costs	1940.027	2375.246	2734.476		727. 777	77.70.	
lost of finance	35.317	33.458	7 5.7	3==	47244UU)	2072.678	
epayment	5122	55.314	7: 070	2. 777	7.670		
larparate tax	0.000	0.000	7	0 2 2 7 4 4 A DAS Ve 20 0	7.07.	3.222	
lividends paid	0.000	0.000	2.655	V-300	0.000	0.000	
			0.000	3,000	0.000	2,536	
urples ( deficit ; . Liulated cash balance	135.191	145.465	·c: :=·	*** ***	;		
Liulated cash balanna	4084 45B	- 74 258	-2 145		3.053	201.20	
		122.505	55.*51	_33.//C	327.46-	442,54	
fisa, istal Efica, istal	5740 755	1404.507	1541 s81	***. ,	**** *,-		
After Teer	77. (32	254 444			::		
rolus deficit		101000 00001 100001			175.077		
	• 7.0 <del>7</del> .000/					1575.446	
flam foreign	14.147	17.398	3,45 <u>2</u>	B.507		= :.=	
åfia⊭, fareiga	7.	1977.457		5 5 5 6 6	70.6 727	* ***	
salus i seficit i	- 7.1 475	1900.4a0 885.567	-2002.677		********		
inium, turbigs Alflam, farbigs Indius ( deficit ) .				270:.098   78:.777   87:9.701   8.507   2:07.811   -2:59.004		-1111.01	
st castflaw Gulated het castflaw	225.624	7:0 574	722 ATL	0:3.900	*** ***	,	
Zulates par caeralina	.072 774	******* *******	188.078 -18.697		747,823		
	~~ <b>~</b> ****	*104.00	713,271	712.209	150,415		

MaitumBulk Blenc-Coticus Plant-1.541 --- Puquat 19, 1995



			Cafar 1.1	- INTERNATION	AL FEETILIZER I
hflow tabl	es, produ	action :	Thousands of US	Sallers	
• • • • • • • • • • • • • • • • • • • •	2004	7/AE 4773	2006		
el cash infloa	5531.516	3357,259	3105.187		
encial resources . es, set of tax	ç -7e		7 537		
t set of the	7794,723	7457 715	చంది. కాంగ్రామ్		
al cash outflow	Ca:3.575	7451,415	7-77 8:5		
tal assets	Ja. 508	19,452	77.795		
relica costa	1565.634	0a17.577	7,55,000		
t of Assampa	3.158	7 7 7 7	: ::		
ivient	5.005	2,5,4	7, 5.5		
iorate ta.	3.664	5,763			
icense sais	0.000	3.346	5.635		
es ( deficit ) . ate: cash calance	787.941	\$15\$1	21, 775		
Pater cast calarca	701 701		*******		
34. logal	3998.617	2072.747	7.02 3.79		
ica. icrai		777 111	27.5		
The reform		7,5655	****		
· · · · · · · · · · · · · · · · · · ·		20231111	*		
မြေကာင် မြောင်းမြောင်းများ	9.277		2.113		
vow. tereign	1111.549	5555 56.	1171.775		
ow. local	-22:7.929	-2352.495	-1122.615		
i casofica Sulated set casofica		7.7.0.0	Taus TVI Sector Tau		
situ het latit.le		16.56			

Haiti-Bulk Bland-Bottous Planchi.Sri --- August 29, 199



dait:-531k Siend-Egrique Flant-1.5:1 --- August 29, 1790



--- COMMAND CLI - IN HONOTICISMO FEBRUALISMO DEVI CENTER, MUNEBARA -

Net Income Statement:	Thousands of	ET IN THE STATE OF			
Year	1992	1.4 (A) (A)	1992	1.66.2 1.66.3	:756
Tores saides inch saids tax.	11177 11177 11177 11177	1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	end end end die der die der die end der end die end die	1774-701	Control of the contro
Pariable cargon	11.00 15.077	(* (f) (r (r) (r (a) (r) (a) (a)	Philips	100 100 100 100 100 100 100 100 100 100	110
Adon-variable dosts, incl. debreciation	# 1 # 1 # 1 # 1 # 1		13,44		640
As Caf caral makes	rian rian rian mina	# # # # # # # # # # # # # # # # # # #	-4 (.1) -4 (.1) -4 (.1) -4 (.1) -7 (.1) -7 (.1)	43 (cd ) 43 (cd ) 54 (cd ) 54 (cd ) 55 (cd )	1 1 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
Cost of finance	67.76	15- 	Cr	( ) ( )	100
Ordes profit	shsh Sush	orien	de de de la composition della	0.40.4 0.40.4 0.40.4 0.40.4 0.40.4 0.40.4	en en common co common co common com common com
West product	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	75.00	17	100 100 100 100 100 100 100 100 100 100
Condistributed profit	# # # # # # # # # # # # # # # # # # #	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	January Structure Structure Control Control	Grand	1000 6100 6100 6100 6100 6100 6100 6100
Order grofit, A of total sales	the street	parta de planta de la companya de la	्य हैं है के प्रकार के के बेला है जो के को को को के प्रकार को को है है है है	compared to the first of the fi	0.00 0.3 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4 5.4

Abit: -Buik Eimod-Orginus Flent-1.5:1 --- August 29, 199)



	CIMFAR I.:	- INTERNATIONS	L FERTILIZER DEV.	CENTER, ALABAMA
Thousands of	US Dollars			
1992	1573	1998	1775	1996
675.060 531.327	1992.750 910.740	100.897 1165.780	177 <b>4.751</b> 1471.422	1916.763 1584.761
113.833 15.377	162.421	15.577	705.740 17.092	332.002 17.32:
129.725	129.853	129.771	120.124	139.257
-15.697 -1.136	51.561 4.512	105.725 7.538	173.21 <b>5</b> 9.780	201.74 <b>4</b> 10.225
\$7.741	54,124	60.010	55.613	50.779
-27.237 3.336 -23.232 3.436	-00.460   0.000  -00.460   0.000	5.50 3.00 45.514 3.000	0.000 0.000 0.000	150.965 0.000 150.765 0.000
-23.33	-11.451	45.51s	4:7.72	159.965
0.000 -83.000 -83.000	0.000 -01.4±1 -94,694	43.516 43.516 -47.175	9.000 ••• - 110 ••• - 112	0.000 150.945 219.179
	Thousands of 1992	Thousands of US Collars  1992 1993  975.060 1997.760  531.727 910.740  113.833 182.421  15.377 16.594  129.725 129.855  -15.892 57.562  -1.154 4.810  57.741 54.124  -87.727 -10.461  0.000  -83.737 -11.461  0.000  -83.737 -11.461  0.000  -83.737 -11.461  0.000  -83.737 -11.461  0.000  -83.737 -11.461	Thousands of US Collars  1992 1993 1994  695.360 1992.760 1402.497  531.727 910.740 1165.780  113.833 182.421 275.717  15.077 16.594 15.897  129.725 129.855 125.791  -15.892 52.562 105.726  -21.56 4.810 7.535  67.741 64.124 60.210  -87.721 64.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210  -87.721 54.124 60.210	

maxto-Buly Bland-Cottels Flamt-1.5:1 --- August 29, 1990



		CGMFAR 2.1	- INTERNATIONAL	L FERTILIZER DEV.	CENTER, ALABAMA
Net Income Statement in	Thousands of	US Collars			
Year	:99?	1592	1979	2000	ማሳይቀ ሕዝራል
Total sales, incl. sales tax	2073.664 1714.527	2239.886 1851.762	2493.139 1936.935	1559.074 1115.115	7177.71
Variable dargin	355.137 17.319	387.903 17.320	416.204 17.319	443.259 17.319	467.603 17.319
Ada-versecle costs, incl. depreciation	:30.390	139.523	130.655	110.729	130.922
Commencional margin	229.747 11.001	257.350 11.492		212.473 12.209	315.631 12.673
Cost of finance	44.978	38.307	73.486	27.513	16.850
arcss profit	183.769 0.000 183.769 0.000	0.000	0.000 352.062	0.000 28 <b>4.</b> 78 <b>7</b>	319.829 0.000 319.829 0.000
Nes grofit	180.767	219.073	252.052	134,957	319,819
Dividends data	0.000 153.769 402.948	0.000 215.073 520.01:	0.000 252.061 874.023	181.957	0.090 005.909 1478.868
Bross profit, % of total sales Net profit, % of total sales RSE, Net profit, % of equity RSI, Net profit-interest, % of invest.	5.362 40.934	9.751 9.781 48.798 14.135	10,489 10,489 56,146 14,604	11.174 11.174 63.474 15.657	11.846 11.845 71.241 15.774

Harti-Belk Bland-Springs Plant-1.5:1 --- August IF, 1990



		COMEAR 2.1	- INTERMATIENA	L FERTILIZER DEV	. CENTER, ALASAMA
Net Income Statement in					
Year	2002	2602	2904	2005	2005
Total sales, incl. sales tax Less: variable costs, incl. sales tax.					
Variable dargin	488.737 17.320	505.7c5 17.319	518. <b>9</b> 51 17.320	528.838 17.310	537.903 17.320
Non-variable costs, incl. depreciation	131.055	131.198	131.321	131.454	131.463
Operational dargin	357.662 12.676	374.577 :2.827	337.630	397.394 13.015	464,446
Cost of finance	4.593	3.911	1,112	2.227	1.191
Sress profit	353.089 0.000 353.087 0.000	0.000 0.000 0.000 0.000	084.502 0.000 084.502 0.000	395,157 0,000 395,157 0,000	405.245 0.000 405.249 0.000
Net profit	353.089	370.665	784,592	395.157	403.249
Dividence caid	0.050 053.037 1831.987	0.000 370. <b>885</b> 2202. <b>822</b>	0.003 7 <b>84.5</b> 02 <b>2587.124</b>	0.000 395.157 1962.28:	0,000 405,249 3567,529
Fross profit, 2 of total sales  Net profit, 2 of total sales  ROE, Nat profit, 2 of equity  ROI, Net profit*interest, 2 of invest.	12.513 12.513 78.630 16.962	:5.493 :2.693 :32.545 :7.408	12.533 12.533 85.447 17.738	12,942 12,942 88,021 12,933	13.049 13.045 90.248 18.188

Maiti-Bulk Slens-Optimus Plant-1.5:1 --- August 29, 1990



***************************************			INTERNATIONAL FERTILITER DEV. CENTER, ALABAMA
Projected Balance	Sheets,	construction is	Thousands of US Dollars
Year	1991		
Total assets	898.145		
Fixed assets, net of degreciation	0.000		
Construction in progress	898.145		
Current assets	0.000		
Cash, bank	0.000		
Dash surplus, finance available . Loss carried forward	0.000		
Lass carried forward	0.000		
LCSS	0.000		
Total liabilities	898.145		
Equity capital	115 677		
Vacanuas estainan meniin	799.74/ / AAA		
Reserves, retained profit	0.000 0.000		
Profit	4.000 440 777		
- Current Streets and Color	195.73/ 5.666		
Correct liabilities	2.020		
Bank overdræft, finance requires.	2,2/1		
Total dest	449,008		
Equity, % of liabilities	49.985		

haiti-Bulk Blesc-Getisus Flant-1.5:1 --- August 19, 19



		CEMPA	R 2.1 - INTERNA	MIGNAL FERTILIZER	DEV. CENTER, ALAE
Projected Balance	Sheets,	Production	n in Indusands	of US Callers	
Year	1992	1992	1794	1995	1998
Total assets	1277.135	1461.857	:572.4:1	1655.549	1642.507
Fixed assets, net of depreciation	854.725	817.172	777.485	707.655	597.714
Construction in progress	2.000	2.000	1.000	2.663	7.000
Construction in progress Current assets	351.717	544,499	594.715	577,152	939,532
Cash, dank	3,461	3.472	7.5.4	0.000 0.000 0.000	7 777
Cash suralus. Finance available .	0.000	0.600	9.656	0 945 6 945	0.007
Cash surplus, finance available . Loss carried forward	0.000	0.600 82.237	SA -52	49.17E	5.446
1955	27 577	11.451	17.617 0.000	77	3.300
Total liabilities		1461,837	1572,411	1665.548	1642.807
Equity capital	### 077				
Reserves, rataised profit	779:797 A AAA	3,360	0.000	5.333	448.75/ 68.214
Read: Yea, idedinal profit	<b>9:000</b> 6:355	5 + 5 0 t 5 - 5 0 t	0.000 15 511		85.214
FINTAL	9.988 •6. 661	\$ 2000 474 ***	45.515 372.155	117.292 117.292 173.838 128.782	150.965
Long and medius term debt	415.516	401.099	272.105	1,2,111	179.855
Current liabilities	51.173	78,626	99.995	175.781	134.627
Bank overdraft, finance required.	370.173	532.897	a05.80a	575,709	540.008
Total dest	6+8.199	1017.520	:077.958	1099.219	974.691
Equity, 1 of listilities	34.610	<b>39.7:</b> 0	28.551	26.754	57 757 21.502

Hasti-Eulk Blend-Cotious Flant-1.5:1 --- August 29, 1990

----- COMPAR 2.1 - INTERNATIONAL FERTILIZER DEV. CENTER, ALABEMA ----

Projected Balance	Sheets,	Production	ia Thousands	of UE Dollars	
Year	1997	1998	1999	5550	2001
Total assats	1578.748	1718.971	1795.773	1879.437	2147,212
Fixed assets, met of depreciation Construction in progress	457.619 1.000 1015.550 3.569 0.000 0.000	617.411 2.000 1055.938 3.582 3.600 6.000	577.059 40.000 1175.119 0.000 0.000 0.000	574,575 2,000 1050,758 3,617 65,462 0,000 0,000	533.959 2.000 13:6.557 3.6:8 268.775 0.000 3.000
Total liabilities	1578,749	1718.771	1795.773	1999,400	1147.111
Equity depited	448,837 219,078 197,769 198,769 145,641 408,841	448,907 400,948 009,000 0.4,008 0.4,008	448.777 601.001 750.061 187.401 188.741 110.583	448,970 874,080 084,980 084,980	448.557 9859, 75 9859, 75 9859, 809 988,750
Tonal dept	10+,917	347,417	***		117.4 3
Equity, Note Constitution (1999)	2:, 42	15.117	15.	11.1.1	20,915

Cultivities Electricis (Electricis) (Control of the Control of the



Projected Balance	Sheets,	Production	n in Thausands	of eS Dollars	
Year			<b>2004</b>		2008
fotal assets	2504.153	1974.795	7163.115	7:55 7:4	4053.004
Fixed assets, het of depreciation lonstruction in progress	493,208	257 705	411 703		778
Construction in progress	5 555	5.656	744447 5 212	U-137	1.5.07
Current assets	1777 <u>25</u> 9	2.005 4450 870	2.000		1.300
Cash hary	10.11807	A 7.40	1902.	4404	1515.535
Tach confide Grande and the con-	0.210	t.:	3,541	J.÷÷a	ັ້າ. ເວັດ
ussa se dius. Tradica didicale .	02.465	307.2 <b>5</b> 0	1390.791	1784.472	1207.546
					1 0.30
lgss	0.000	0.000	6.000	2.41.5	**** 6 355 1 220
Tetal liabilities	1501.167	1976.385	32 <b>50.118</b>	7257.754	4053.002
Equity deputal Reserves, recauses profut Profit	448.907	449,937	443.977		
deserves. retaines profit	1478.258	1871, 987	OFAR LTR	770.763	773,737
refit	757.123	770.665	T84.501		1951,121
LOGI and medium term dammi	0_ ATT		-54.3.1	39 <u>5.157</u>	405,219
Spream Rightserie	_0:0:	1.,254		7,947	A 1 4A 1 4 4 4 2
interesta de la companya de la comp	175.	-10.7/2	219.218	117.181	213.773
long and redium term deat				7.000	A 4A*
Total mebt	537,263	214,817	224,057	121.434	215,773
County, Not liabilities	17.928	:5,509	13.771	12,232	11.75

Hasti-Bulk BlenchScttaum Plant-1.5s1 --- August 19.

### APPENDIX X

COMFARO Input Data Entry Forms

		COMFAR - DATEN
1 Project name:	De E P	
2 Date and time:	Haiti - Bulk Blend -	Simple - 1.5:1
3 Remarks:	Discounted Selling	
4 Accounting units and currency:	Thousands of Us	Price
5 Product name(a)		
		sub-menu-
Product A:	Usea (Granular)	
Product B:	Ammonium Sulfate	(Standard)
Product C:	40-30-10	
Product D:	12-12-20	
Product B:	14-14-14	
Product F:		
2 0	•	
U B A	VERAL VARIA	BLES
		- Course
1 Foreign currence		COMFAR - DATEN -
1 Foreign currency co	nversion rate:	1.0
2 Local currency co		0.6667
3 Duration of constru (maximum four years otherwise maximum	ction (in years); if half-yearly.	0/2/3/4/5/6/7/8
	Ruf Assle)	
4 Planning during cons	truction:	rly/half-yearly
5 Cashflow discounting	rate (in per cent)	-
1 Discounting rate f	or net present value:	L sub-menu
	A Propert Value;	[15.0]
6 Equity and substa		
6 Equity and subsidy co	onditions	
		sub-menu
1 Foreign equity	year disbu	Irsement starts
1 Foreign equity - c	P(rdinary);	[-7-7
<ul><li>Foreign equity - p</li><li>Foreign subsidy:</li></ul>	(referred):	[
		[ <del></del>
40119 - 0		
1=11y = p	(referred);	ļ <del>-</del>
6 Local subsidy:		ļ <del>;</del>
		L

### 2. GENERAL VARIABLES

COMPAN AND AND AND AND AND AND AND AND AND A
7 Loss and overdraft conditions
foreign loan A
1 Year disbursement starts:
2 Amortization type: constant principal (annuity/profile
3 Amortization period (in years):
4 Amortization paid: (yearly)half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
. 15% from year / through //
from year through through
foreign loan B
1 Year disbursement starts:
1 7 1
Amortization type: constant principal/annuity/profile  Amortization period '(in years):
<b>—</b>
4 Amortization paid: yearly haif-yearly/quarterly 5 Grace period (in years):
6 Interest rate (in per cent per year):
from year 7 through 76 through from year through through
foreign loan C
1 Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year);
from year through through from year through
foreign overdraft
1 Year disbursement starts:
6 Interest rate (in per cent per year);
from year / through /6 from year through /6 from year through

### 2. GENERAL VARIABLES

	· COMFAR - DATE
local loan A	sub-meni
1 Year disbursement starts:	۲
2 Amortization type: constant principal	
3 Amortization period (in years):	PROTTY PROTTI
4 Amonttonator or	L_U early/quarterly
Grace period (in years):	["/"]
6 Interest rate (in per cent per year);	L]
15 % from year from year from year	through // through through
local loan B	sub-menu
1 Year disbursement starts:	[]
2 Amortization type: constant principal/ar	Inuity/profile
3 Amortization period (in years):	
4 Amortization paid: yearly/half-year	rly/quarterly
Grace period (in years):	[]
rate (in per cent per year);	~d
170m year	through through through
local loan C	sub-menu
1 Year disbursement starts:	[]
2 Amortization type: constant principal/ann	4117/070(1)
3 Amortization period (in years);	[]
4 Amortization paid: yearly/half-year	ly/quarterly
Grace period (in years);	[
6 Interest rate (in per cent per year);	·1
. irom year th	rough rough
ocal overdraft	sub-menu
Year disbursement starts:	[* <u>*</u> ***
Interest rate (in per cent per year)	
22 from year 7 thr	ough 16

	Column	1	1	3	4	5	6	7		•	10	11	12
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1	Land	-					*******			******			
8	Site preparation and development												
•	Structures and civil engineering (a)	5.0	1	0	20	152							
4	Structures and civil engineering (b)												
\$ .	ine. fix. seceto (e) constr., transport												
€ .	ine, fix, accets (b) technology, start-up	6-67	1	0	15	15							
7	ine, fiz. essets (c) ethers												
• 1	Plent, mechinery and equipment (a)	6.67	1	0	15	212.8							
•	Plant, machinery and eqipment (b)	12.5	1	0	8	38							
10.	Anzillary & corvice facilities												
11	Pre-production ex- penditures					102							
12	Inventory		<del></del> -										

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13	Land				]	j		j	*******				
14	Site preparation and development					66							
15	Structures and civil engineering (a)	5	1	0	20	84							
16	Structures and civil engineering (b)												
. 17	ine, fix, assets (a) constr., transport									******			
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19	ine, fix, assets (e) ethers												
20	Plant, mechinery and equipment (a)					30							
21	Plant, machinery and eqipment (b)				*******	******							
22	Auxiliary & corvice facilities					******							
23	Pro-production ez- penditores					18							
14	inventery												

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22	Raw Salerial (a)									41 LeoA   CI Leo		mental year 9   year 10   year 11   year 12   year 15	1	yeer 12	year 13	700F 14	year 15
53	Rew material (b)				-				-								
<u>.</u>	01111116		:							-							
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36	Labour, direct					-											
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<b>:</b>	Administration, labour costs			-													F 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
<b>5</b>	Administration, non-labour																
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3	Merkeling, non-labour																
	•			7	7												

# 3.3.3 STANDARD' PRODUCHIOM CORMS - (f)oreign

Control   Cont		-	
### material (a) 1) 1582.6 100 39.726 100 56.427  ###################################		$\overline{}$	
1   1582.5   100   59.422   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100	Value/alvari.		-
Manufaction (b) 1)  Unit cost 2)  Unit cost 2)  Unit cost 2)  Unitities p.s.  Labour, direct p.s.  Maint, a repairs p.s.  Rectory overhead p.s.  Admin, labour p.s.  Markeling labour p.s.  Markeling labour p.s.	C. 4.2		
unit cost 1)  unit cost 2)  Utilities p.s.  Labour, direct p.s.  Maint, a repairs p.s.  Rectory overhead p.s.  Admin, labour p.s.  Markeling labour p.s.  Markeling labour p.s.	772	18. 100 136	48 100
Unit cost 2)  Energy p.a.  Maint, a repaire p.a.  Bpare parts p.a.  Bactery overband p.a.  Admin. labour p.a.  Marketing labour p.a.  Marketing labour p.a.	0,		7.0
Energy p.a. Labour, direct p.a. Maint, a repaire p.a. Bpere perte p.a. Rectory overband p.a. Admin, labour p.a. non-lab, p.a. Marketing labour p.a.			
Maint, a repaire p.a.  Maint, a repaire p.a.  Spare parts  Adein, labour p.a.  Marketing labour p.a.  Marketing labour p.a.			
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Maint, a repaire p.e.  Spare parts p.e.  Pactery overband p.e.  Admin. labour p.e.  Markeling labour p.e.			
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Merheling lebour p.e.			
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¹⁾ anier either quantity (units consumed p. s.) or annual costs
2) enter 1: if annual costs are entered instead of quantity

	F																
r	Columna	7	1 :	1	7	7		1	-1	· T	· · · · · · · · · · · · · · · · · · ·	·	,	,			
Lines	Description of cost and cost adjustment item	Inflat.		duct:	-	.l	( <b>:</b>	1	.		1	11	12	13	14	1	1 ''
83	Rew material (a)	} · • • •	year 1	year 2	year 3	year 4	Jyear 5	19007	year 7	, year 8	Year .	Year 10	year 11	Prod 12 year 12	u e      year 13	0 R	h a a a
#2	Raw material (b)	·		-}			1	I	1						,	7	
-14	Utilities	}					ļ	ļ									1
85	Bnergy	ļ															
46	Labour, direct	}	-														
87	Maintenance, repairs	<b></b>															1
**	Spare parts		.}	·		1 1			"								
• •	Pactory overheads		·}														
90	Administration, labour costs		·}							ļ							
91	Administration, non-labour																
3.5	Marketing, labour														•••••	*****	
3.3	Marketing, non-labour															******	
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3.3.2 STANDARD PRODUCTION COSTS -

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r	Columns	1	3	,	7	1	-1			1:	·	,	.,
f/i		Prod value/a	uct A  veri. \$	Prod value/a	luct B iveri. 1	Pro	duet C	Prod	lect p		uct E	Pro	12 Juet 7
14	Raw material (a) 1)	144.27	100	3.724			,,			velue/a	verl.	velue/	jvarl. 4
95	unit coet 2)			1.0	7,00	5.365	100	84.799	100	16:168.	100	ļ	
16	Raw material (b) 1)	147.9	100	5.1	100	5.1		1.0		1.0			
97	unit cost 2)			1.0	1	1.0	100	81.6	(00	15.3	100		
**	Dillities p.s.		80.619	0.373	80.619		80.619	110	00.00	1.0			
**	Energy p.a.	5.757	37.34	0.198	37.24	0.190	,	5.971			80.619	,	
100	p.u.	22.425	23.277	0.773	23.277	0.772	23.277	3.176	21.29	0.595			
	Maint, a repairs p.s.						2316(1	15:316	23.277	5:35	23:277		
		0.29	0	0.01	0	0.01	0	0.16	0	4.02			
103	pia.	3.48	0	0.12	0	0.12	0	1.92	0	0.03	0		
104		47.968	0	1.654	0	1.654		76 46s		0.36	.0		
103	non-lab. p.a.							37.3365	.e	4.942.	. 0		
100	Marketing labour p.a.												
107	non-lab. p.a.												

¹⁾ enter either quentity (units consumed p. s.) or ennual costs 2) enter "1" if ennual costs are entered instead of quentity

Lines Deecription Inflat, Production phase Sysor diver Typer Diver 1 per 10 per 11 per 13 per 15 per ------------------- (floreign SALES Total other dir. non-var. coats Total other dir. non-var. costs Total other direct sales costs other dir. non-ver. costs .... Labour costs includ. In 114 Labour costs includ. in 120 Labour costs includ. in 126 Total other direct sales ٩ Quantity produced/sold × Quenilty produced/sold Sales price per unit Sales price per unit Culum Sales price per unit Total other direct DOCT seles tex PRODUCTION Total sales tax Total sales tax -112 113 -115 11 118 129 1 20 7 227 124 1 25 126

3.4 PRODUCTION AND SALES - (f)oreign

Quantity produced/sold  Site price per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales contained to the per unit  Total other direct sales	-	:		~	-	•	•	•	_	-	<u>-</u>	=		-				
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170	Quantity produced/sold	900	164	258	33/	502	642	1202	1773	17-55	T=335	1474	1222	1777	-,	, ,	• • • • •	• - • •
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171 172 173 174	Sales price per unit Total sales tax Total other direct sales costs Total other dir. non-var. costs	900	/64 0.307	258 0.307	33/ 0.307	502 0.307	542 0.307	586 0.307	633 0.307	679 0.307	723 0307	763 0307	798 0.307	825	8.43	7. 86 7. 0.3	3	8.7 0.3
171 172 173 174 175	Sales price per unit Total sales tax Total other direct sales costs Total other dir. non-var. costs Labour costs includ. in 174	900	0.307	258 0.307	33/ 0.307	502 0.307	542 0.307	586 0.307	633 0307	679 0.307	723 0.307	763 0307	798 0.307	825	8.4.3	7. <i>86</i> 7. <i>0.</i> 3	3 07	8.7 0.3
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171 172 173 174 175	Sales price per unit  Total sales tax  Total other direct sales costs  Total other dir. non-var. costs  Labour costs includ. in 174  PRODUCT P	900	0.307	268 0.307	33/ 0.307	502 0.307	542 0.307	566 0.307	0.307	0.307	723 0307	763 0307	798 0.307	825	0.30	7. 86	307	8.70.3
171 172 173 174 175 78 71	Sales price per unit  Total sales tax  Total other direct sales costs  Total other dir. non-var. costs  Labour costs includ. in 174  PRODUCT P  Quantity produced/sold  Sales price per unit  Total sales tax	900	0.307	268 0.307	33/ 0.307	502 0.307	542 0.307	586 0.307	633 0.307	679 0.307	723 0307	763 0307	798 0.307	825	8.4.5	7. 86 7. 0.3	3 07	8.7 0.3
171 172 173 174 175 78 71 78	Sales price per unit  Total sales tax  Total other direct sales costs  Total other dir. non-ver. costs  Labour costs includ. in 174  PRODUCT P  Quantity produced/sold  Sales price per unit	900	0.307	268 0.307	33/	502 0.307	542 0.307	586 0.307	633 0.307	679 0.307	723 0307	763 0307	798	825	8.4.5	7. 86 7. 0.3	3.07	8.7

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### 3.5 WORKING CAPITAL REQUIREMENTS

r	Columns	1	2	<b></b>	<b></b> η
Lines	Description of assets/liabilities	Min Production	nimum cove ts/costs local	rage (in de Cash in foreign	ays) hand local

### ASSETS

Accounts receivable/ /cash in hand:

3c	30	15	15
		• -	17

### INVENTORIES

183 Raw material (a):

184 Raw material (b):

185 Utilities:

186 Energy:

187 Spare parts:

188 Work in progress:

189 Finished products:

90	90
90	90
30 ·	30
30	30
360	360
0	0
2	Z

### LIABILITIES

190 Accounts payable:

30 30

### elistic () - BUXVXII LO SHUKDOS, 9°C

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LOANS AND OVERDRAFTS	OVERGRAFTS																				
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on rate:  /-OO  in years): /-OO  in years): /
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### 2. GENERAL VARIABLES

7 Loan and overdraft conditions
foreign loan A
1 Year diabursement starts:
2 Amortization type: constant principal annuity/profile
3 Amortization period (in years):
4 Amortization paid: yearly half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
. /5% from year / through
from year through through
foreign loan B
1 Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 Amortization paid: (yearly half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year from year through from year through through
foreign loan C
1 Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
Amortization period (in years):
4 Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year);
from year through through through
foreign overdraft
1 Year disbursement starts:
6 Interest rate (in per cent per year);
from year through 16 through from year

### 2. GENERAL VARIABLES

COMFAR - DATE
Total land
local loan A Sub-menu
starts:
rype: constant principal (annuity) profile
4 Amount of period (in years):
A Jearly/quarterly
(in years):
6 Interest rate (in per cent per year):
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local loan B
1 Year dishursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year through through from year through through
local loan C
1 Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year through through from year through
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local overdraft
1 Year disbursement starts:
6 Interest rate (in per cent per year)
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	Column	1	1	3	4	5	•	7	8	•	18	11	12
Lines	Description of investment	Deprec		Sel. v.	Depr.p. years		ction pho per. I				lod = ye per. 6		
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8. :	Site preparation and development												
3 -	Structures and civil engineering (a)	5.0	1	0	20	152						-	
4	Structures and civil engineering (b)												
<b>5</b> .	ine. fix. senets (a) countr., transport												
• :	ine, fix, essets (b) technology, start-up	6.67	/	0	15	15							
Ŧ	ine. fix. assets (e) ethers									<u> </u>		<u> </u>	
•	Plant, mechinery and equipment (a)	6.67	1	0	15	212.8		<u> </u>		<u> </u>			
•	Plant, machinery and eqipment (b)	12.5	1	0	8	39		<u> </u>				<u>                                     </u>	
10:	Auxiliary & service facilities				<u>                                     </u>	<u> </u>							
11	Pre-production ex- penditures					102							
12	Inventory												

3.1 INITIAL PITER INCOME.

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	Columns	1	3	3	4	5	6	1		•	10	11	12
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18	Land					<u> </u>		<u> </u>					
14	Site preparation and development					66				 		<u> </u>	
16	Structures and civil engineering (a)	5	1	0	20	84						·	
16	Structures and civil engineering (b)												
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22	Auxiliary & carvios facilities												
13	Pro-production og- penditures					18							ļ <b>-</b>
24	Inventory										·	1	·

3.3 CORREAT PLAND LEVESTREAT - (f)oreign

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	ion of cost and djustment item strong tem at (a) at (b)  rect e, repaire e erheads tion, labour coste tion, non-labour labour	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	djustment item	distinct frem tp. s. year 1 year 2 year 3 year 4 year 7 year 8 year 9 year 10 year 11 year 12 year 14 year 14 year 14 year 14 year 14 year 15 year 16 year 17 year 18 year 18 year 18 year 18 year 19 year 10 year 11 year 12 year 19 year 19 year 19 year 10 year 11 year 12 year 19 year 19 year 19 year 10

### 3,3.3 STANDARD' PRODUCTION COSTS - (f)oreign

	p	,	,					•					
c	Columns	1	2		4	3	•	, ,	•	•	10	11	11
Lines	Description of pro- duction costs item	Produvalue/a		Prodi value/a		Prodi value/a			et D		uet B  veri. l	Prodivalue/e	eat P
44	Raw material (a) 1)	1582.5	100	39.726	100	56.427	100	730.84	100	136.48	100		
45	unit cost 2)			1.0		1.0		1.0		1.0			
44	Raw material (b) 1)												
87	unit cost 2)												
	Otilities p.s.												
49	Energy p.a.												
10	Labour, direct p.a.												
71	Maint, & repairs p.s.												
71	Spare parts p.a.												
13	Pactory overhead p.a.												
74	Admin, labour p.a.												
73	non-lab. p.a.				_	******		_					******
76	Marketing labour p.a.												
11	non-lab. p.a.												
78	total depres, borne 1												

¹⁾ enter either quantity (units consumed p. a.) or annual costs.

3.1 ANNUAL PRODUCTION COSTS .

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					4-year 15												
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					11   7007		-	-	-					_	_		_
		11	-		1 10 year		<u> </u>	<u> </u>									
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	-		0 3 D 0	r I Jean		-	+	+	+	<u> </u>		+		-	<u> </u>	-	
	_		Inflat. Produc	1 p. a. year 1  yea	-												· · · · · · · · · · · · · · · · · · ·
-J	_		E .		<u></u>			<u>:</u>	<u>:</u>		<u>.i</u> _	<u> </u>				<u>!</u>	;
		Description of con-	COS ( DO THE DEST OF THE PARTY		O A ROW DELCTION (C)   YOUR DISCUSSION OF THE PROPERTY OF THE	Raw material (b)	U1111116.	<b></b>	Labour, direct	Maintenance, repairs	Spare parts	Pactory overleads	Administration, labour costs	Adainietration, non-labour	Marketing, labour	Merketing, non-labour	
_		Lines -	_		12 Rt	13 Ra	110 11.	85 Bnergy	86 Labo	- N - 1	Spar	19 7401	90 Admi	31 Adai	9: Mark	93 Merke	

## 2.3.3 STANDARD PRODUCTION COSTS .

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			-				-		Ī	-			:				
	_	Product	3		<u>:</u>		-	<u>!</u>	<u>!</u>		<u> </u>						
	=		\. 10.0 \.								: : :						
	9	101	veri.	001		100		30.60	37.34	13.277		0	o	0			
	-	Product B Product	value/a  vari. 6 value/a  vari.	181-91	0,0	15.3	0.7	//2	295	78.7		5.03	.36	.362			_
	•	٥	7	00)		00/		6/90	7.34	3.177		0	0	24		+	-
	•	Produc	>	4.79.E	0.7	9.79	0.7	5971 8	176	312 2			92	5%			-
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1		Produc.		367	0	<u> </u>	0	32.8	99 37	13 23	-		5	25	+	-	-
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~		veri.	7	- 700		100		675	75.34	(3.277		٥ (		-	+		
-		value/a vart. 6 value/a vart. 9 value/a tont	יהול אין	3) (13:41 / 20 3:424 / 60 5:365 / 60 84:774 / 60 / 6481 / 100	0.7	1,11,1 100 5.1 100 81.6 100 15.3 100	0.7 0.7 0.7	10. 16. 10. 10. 12. 180. 619 0.372 10. 619 5.971 30.619 1.12 180.679	131	64.46 43.277 0.713 23.277 0.773 23.277 12.312 23.277 2.32 23.277	97.0	2 40 0 0.01 0 0.01 0 0.05 0	8.4. 47 9.0	P. 6.	-	-	
Co l uan e	Description of pro-	1 t e m	3	unit cost 2)					direct	:		Zactory overhead p.a.		non-leb. p.e.	ing lebour p.s.	non-1ab. p.a.	<u>:</u>
		T/1 *) duction coats		2			98 Ottilii.	19 Energy	100 Labou	101 Kaint	102 Spare	183 Pactor	184 Admin. labour	103	196 Marketing labou	101	
į	3							_	_	-	-	-	-	-	-	~	

### 2.4 PRODUCTION AND SALES - (f)oreign

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Lines	Description	Inflat.	PPO	5 u c t	1 o n	-						-1				.1	1.16
		1 p. a.	. year	ljyear :	year	year	djyear	Syeer	Slyear	1   300 0	year 9	Yeer	Olyeer I		duet Zivene 1		
	PRODUCT A							,		,,	******	*****	*******	*******		*******	dini
10	Quantity produced/sold		۲	1	······	·j	-			٠,		•,••••	•,••••	•,••••	•••••	••••	
11	Salea price per unit	ſ	·	·	· <del> </del>	.		-					.	.			
1 2	Total sales tex	<b>}</b>	<b>}</b> -		ļ	·			.		! 		.				1
13	Total other direct sales coats	<b>}</b>	}			·}		.		<u>.</u>		.l					
14	Total other dir. non-var. costs	}	}	ļ	ļ	·}											` ·
5	Labour costs includ. in 114	ļ		}	ļ		ļ	.	.	1						1	
		L	L	l	l	l	l	.l <u></u> ,	.1	1				·	1		
	PRODUCT B									~~~~		•				. L	
	Quantity produced/sold	ſ	- <b></b> ₁		•••••	·····	·	· • • • • • • • • • • • • • • • • • • •	,,	<b>~</b>			_				
,	Sales price per unit	r						ļ									1
	Total sales tax	h							1						ļ		· · · · ·
•	Total other direct sales costs	} <b></b>					ļ	l	l					<b> </b>			
•	Total other dir. non-war. costs	} <u>-</u>						l								*****	
l	Labour costs Includ. In 120	ļļ													}	<b> </b> -	ļ
	Castor Costs Includ. In 120	ll	1														}
	PRODUCT C							• • • • • • • •	*	h							l
1	Quantity produced/sold						<b>,</b>	(	<b> </b>	)· <b></b>	r		·	ı	,	,	,
_	Sales price per unit	[		******				}		·	}						
	Total sales tax							}									l
	Total other direct sales costs																
	Total other dir. non-var. costa																
	Labour costs includ. In 176																
		J.	1	}				1									

...... ...... ..... ..... ..... ..... - (f)ereign ------..... ..... SALES ether dir. non-ver. costs .... .... .... .... 77 Labour costs Includ. In 138 ether dir. non-var. direct sales ٥ ٩ Labour coals includ. In produced/eold Quantity produced/sold produced/eeld z < per uni price per unit cools includ. D 0 C T ) 0 0 ። Salve price per D C C T 1 O K ። Sales price :: • Cher ::: Tolel 70101 Tolel Total To 1 a 1 Total Total Total 0 • ٠. : : : : 2 2 2 ~ ~ :: : : : : : = =

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Line	D o o o o o o o o o o o o o o o o o o o				4	, , , , , , , , , , , , , , , , , , ,	200%	, ,,,,					yeer 11	27	13		
	A 100004								-	,							7
Ξ	Quentity produced/seld	8700 2126 324	2126	3245	6604	50/6	5236	2005	6//9	959	(993	15 4099 5010 5236 5666 6119 6566 693 7377 7709 7979 2186 8344 8784	7709	7973	27.86	24.50	848
Ξ	Sales price per unit		0.318 0.3	0.318	0.318	0.318	0.311	0,34	0.318.	0.3/8.	6.318.	4.31K.	0.3U.	0.318	0.3/8	0.3/4.	0.20
Ξ	Total sales tes															:	!
=	Total other direct cales costs											-	:			:	:
13	Total other dir. nen-ver. costs			_													-
<u>:</u>	Labour coale includ. in 130																
										•	•						
2	Plos/psupped Allsend	300	65	103	132	1211	181	195	7//2	226	74	3 132 167 181 195 211 226 241 254 266 275 282 293	266	275	282	388	39
3	Sales prince per call		0.244 0.2	6420	0.249	9.244	0.244	0.244	7420	2.244	0.244	2.244	6.544	0.244	0.249	5470	77.0
13.	Total sales ter																
23	Total other direct sales costs																
=	Total ether dir. non-var. costs																
133	Labour ceste Includ. In 156	نـــن															
	PRODUCTO																
::	Quenilly produced/sold	300	82	103	281	147	181	195	2//	226	741	3 132 147 181 195 211 226 241 254 266 275 282 288 293	266	732	287	288	200
:	Sales price per unit		0.347	0.347	246.0	0.347	0.347	0.39	0.347	2760	0.347	0.347	0.347	245	0.347.	0.347.	0.74
=	Total sales lex																
Ξ	Total other direct extre costs																
=	Total other dir. non-vor. costs						,										:
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Fredre 1 year 2 year 3 year 4 year 5 year 8 year 9 year 10 year 11 year 12 year 13 yea 0.340 4402 4517 6.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 | 0.340 633 679 723 763 798 825 847 0.318. 0.318. 0.318. 0.318. 0.318. 0.318. 0.318. 0.318. 0.318. 0.318. 1917 2502 2887 3126 3376 3623 3858 4070 4253 ...... ....... ..... ------1 458 331 502 542 566 -----..... ...... -----(1) 39) ..... ..... 006 . . . . . . 8 H 7 Y .... : .... = .... Total ather direct sales costs 0 . . c r 1 p t 1 . n other dir. non-var. direct solve Total other dir. non-var. costs includ. in = Quantity produced/sold Quentity produced/sold Quentity produced/eald Sales price per unit 20000 Sales price per unit Lebeur costs includ. Sales price per unit 1000 7 C 1 : seles tax RODUCTION : Total asies 0 Total seles Lebour Total 70101 Total ,........ :: : 3 10 = . . = 172 113 17 7. ----173 176 111 176

:::

other dir. non-ver.

Tolel

Includ.

.,..,

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Total other direct sales

: : :

# 3.5 WORKING CAPITAL REQUIREMENTS

		T			
r	Columns	1	2	3	
Lines	Description of assets/liabilities	Produc	imum cove	rage (in de Cash in foreign	hand

### ASSETS

182	Accounts /cash in	receivable/ hand:	30	30	15	15	
						L. I	

### INVENTORIES

183	<b>n</b> -	r	·
	Raw material (a):	90	90
184	Raw material (b):	90	90
185	Otilities:	30 ·	30
186	Energy:	30	30
187	Spare parts:	360	360
188	Work in progress:	0	0
189	Pinished products:	2	2

### LIABILITIES

190	Accounts	payable:	30	30	
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# 1.6 'SOURCES OF TINAMOR - (f)ereign

259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26  259-26	and the second s			4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
256.66  34  26.66  36  26.66  36  36  36  37  36  36  36  37  36  36						
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## CRANTS  ## CRANTS  ## C CRAN						
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AD GRANTS  B. S. O. U. C. S.  CAMTS	Per. 3 per. 4		2 2	10 10 10 10 10 10 10 10 10 10 10 10 10 1		
Columns  Col						60
		EQUITY. SUBSIDIES AND CHANTS  191 OFFICE OFFICE  193 DEFFERENCE OFFICE  193 OUDSIGIES & FEBRE	134 1040 A 269 135 1040 B 36 137 1040 C 1040 drg. 137 1040 C 1040 drg. 138 1040 C 1040 drg.	Columns Columns Description per LQUITY. SUBSIDIES AND CRANTS	<u> </u>	

1 ........ Additional las en profit dietributed (in \$) ...... ........... fer of Additional in years foreign Period to c/f loss. in years ----------Ton holl-La years CASMPLOW Law rate Constant 0 -Income las : l-verlable O H V 0 ...... Preferred equily, foreign . . . . . . . . . .quily, fereign Preferred equity, local squilty. local Depreciation allowance PROFIT DISTRIBUTED ON: Income tex adjustment Verieble tax rate (1) Investment allowence T A X Colte Income tax descriptors Description Ce I vene • # 0 U # -. . . . . . . . . • erdinery Lines 202 201 : 303 ~ 3.2 === :

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		COMPAR - DATEN
1 Project name:	Ihili P al . I	4
2 Date and time:	THE - BAIR BIENG -	Optimum - 1.5:1
3 Remarks:	Dicement Coll	
4 Accounting units	Thousands of U	Penç
and currency:	LY TODAY OF US	Dollars
5 Product name(s)		
Product A:	Usea (Granular)	sub-menu
Product B:	Ammonium Suifati	
Product C:	20-20-10	(Standard)
Product D:	12-12-20	
Product E:	14-14-14	
Product F:		*************
•		
2. G B	NERAL VARIA	ABT. R.
•		COMFAR - DATEN
1 Foreign currency c	onversion rate:	[ / ^
2 Local currency c	onversion rate:	1.0
3 Duration of second		0.6667
(maximum four year: otherwise maximum	s if half-yearly, eight years)	@2/3/4/5/6/7/8
4 Planning during co		
5 Cashflow discounting	of rate (in per cent)	early/half-yearly
		sub-menu
- biscounting rate	for net present value	15.0
		L
•	•	
6 Equity and subsidy	conditions	
*****		sub-meny
	year dis	bursement starts
1 Foreign equity -	o(rdinary):	[7]
2 Foreign equity -	p(referred):	h
3 Foreign subsidy:		} <del>'</del> ,
4 Local equity -	o(rdinary);	·
•	p(referred);	·;
6 Local subsidy:		
		[ / ]

## 2. GENERAL VARIABLES

7 Loan and overdraft conditions	-
foreign loan A	u
1 Year disbursement starts:	1
2 Amortization type: constant principal (annuity/profile	]
3 Amortization period (in years):	e 1
4 455545	ł
5 Grace period (in years): yearly half-yearly/quarteriy	r I
6 Interest rate (in per cent per year):	
/5°/o from year / through // through from year through through	
foreign loan B	ı
1 Year disbursement starts:	
191	
Amortization type: constant principal/ennuity/profile  Amortization period (in years):	
5 Grace period (in years): yearly half-yearly/quarterly	
6 Interest rate (in per cent per year):	
from year 7 through 16 from year through through	
foreign loan C sub-menu	
1 Year disbursement starts:	
2 Amortization type: constant principal/annuity/profile	
3 Amortization period (in years):	
4 Amortization paid: yearly/half-yearly/quarterly	
5 Grace period (in years);	
6 Interest rate (in per cent per year):	
from year through from year through through	
foreign overdraft	
1 Year disbursement starts:	
6 Interest rate (in per cent per year):	
from year   through   16   from year   through   16   from year   through   through	

# 2. GENERAL VARIABLES

CO	MFAR - DATE
local loan A	sub-meni
1 Year disbursement starts:	
	/
2 Amortization type: constant principal annual Amortization period (in years):	profile
1 Amonttonation of	[10]
5 Grace period (in years):	y/quarterly 
S Interest rate (in per cent per year):	L]
15% from year / the from year the from year	rough // rough rough
local loan B	sub-meny
1 Year disbursement starts:	[]
2 Amortization type: constant principal/annui	L
3 Amortization period (in years):	[]
4 Amortization paid: yearly/half-yearly	/quarterly
Grace period (in years):	[
6 Interest rate (in per cent per year):	
from year three	ough ough
local loan C	sub-menu
1 Year disbursement starts:	r
2 Amortization type: constant principal/annuit	
3 Amortization period (in years):	y/profile
4 Amortization paid: yearly/half-yearly/	
5 Grace period (in years):	quarterly
6 Interest rate (in per cent per year):	LJ
from year through	
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1 Year disbursement starts:	[77]
6 Interest rate (in per cent per year)	<u>[_/_]</u>
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	Column	1	3	3	•	5	6	7	8	•	10	11	12
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•	Structures and civil engineering (b)												
8 .	ine, fix, secete (a) coastr., transport												
• :	ine, fix. accets (b) technology, start-up	6.67	/	o	15	50							
7	ine, fix. assets (e) others												
•	Plant, machinery and equipment (s)	6.67	,	0	15	288.8							
•	Plant, machinery and eqipment (b)	12.5	,	0	8	38							
10:	Auxiliary & corvice facilities												
11	Pre-production ex- penditures					118							
12	Inventory												

3.1 INITIAL PIEBD INVESTMENT - (1)ocal

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16	Structures and civil engineering (a)	5	1	0	20	109							
16	Structures and civil engineering (b)												
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11	Pro-production oz- ponditures					22	******						
34	Inventory					******						*****	
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3.3.1 AMMUAL PRODUCTION COSTS - (f)oreign

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# 1.1.2 STANDAND' PRODUCTION COSTS - (f)ersign

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3.3.1 AKKUAL PRODUCTION COSTS -

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PRODUCT 8				· ł · · · · · ·	l	i										·· ··
152 Quantity produced/sold	F====-	<b></b>								•						••••
153 Sales price per unit	300	49	103	132	167	181	195	7777	77.7.7.7	T 32::-		ر دور در اوا	, . ,	,	• • • • • • • • •	• • • • •
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135 Total other direct sales costs		ļ			7	1	- VISCE.	1. 12.561	1. 10:681	10.721	10.22!	0.22	1 0.22	0.22/	. Q.ZZL	0.2
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136 Total other dir, non-var, costa									• 🕂	·}				.		
37 Labour coate includ. In 156					·	·			· <del> </del> · · · · · ·				.[		1	
PRODUCT C		******			l	.L	.l	-l	.1	.l	.l	.1				
8 Quantity produced/sold	300	·ä·:1		•••••	,	•••••										
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# 3.5 WORKING CAPITAL REQUIREMENTS

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### A S.S E T S

182	Accounts	receivable/	Γ
	/cach to	hand.	•

30	30	15	15

### INVENTORIES

183	Rew	material	(a):
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184 Raw material (b):

185 Otilities:

186 Energy:

187 Spare parts:

188 Work in progress:

189

Pinished products:

180	180
180	180
30	30
30	30
360	360
0	0
2	2

### LIABILITIES

190 Accounts payable: 30 30

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## 2.7 INCOME, TAX AND CASHPLOW

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	F																
r	Columns	1	7	· · · · · · · · · · · · · · · · · · ·													
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204	Investment allowence			******			year s	year 7	y	j year 9		year 11	year   1	0 d 0 d 1	year 14	1 Year 1	6 I
207	Depreciation allowance		<b></b>			·				l			,				-1
200	income tax adjustment				ļ						******	******				• • • • • • • •	-1
	Variable tax rate (1)		ļ									~~~~					-
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	ordinary equity, foreign												******			ļ	1
<b>313</b>	ordinary equity, local																1
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	COMPAR - DATEN	
1 Project name:	Haiti - Bulk Blend - OpTIMUM - 1.5	٠.,
2 Date and time:	opinium 10	: .
3 Remorks:	MAXIMUM Selling PRICE	
4 Accounting units and currency:	Thousands of US Dollars	
5 Product name(s)		***
Product A:	Urca (Granular)	
Product B:	Ammonium Suffate (Standard)	
Product C:	20-20-10	
Product D:	12-12-20	
Product E:	14-14-14	
Product F:		
2. g m		
.· u s	NERAL VARIABLES	
	COMPAR - DATEN	
1 Foreign currency	CASUADA	
2 Local currency		
3 Duration of const.	0.006/	
(meximum four year otherwise meximum		
4 Planning during co	one toward	
	ing rate (in per cent)	
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I Discounting rate	for net present value: [15.0]	
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6 Equity and subsidy	conditions	
	sub-menu	
	year disbursement starts	
1 Foreign equity		
2 Foreign equity	- p(referred);	
3 Foreign subsidy:	} <del>'</del>	
4 Local equity.	o(rdinary):	
5 Local equity -	p(referred);	
6 Local subsidy:	├ <del>;</del> ┤	
	<u> </u>	

## 2. GENERAL VARIABLES

7 Loan and overdraft conditions	MFAR - DATEN -
foreign loen A	sub-meny
1 Year disbursement starts:	[
2 Amortization type: constant principal (an	
3 Amortization period (in years):	
4 Amortization paid: yearly half-year	
5 Grace period (in years):	[7]
6 Interest rate (in per cent per year):	L/]
15% from year from year	prontp
foreign loan B	sap-weva
1 Year disbursement starts:	[]
2 Amortization type: constant principal/ann	[-7]
3 Amortization period (in years):	
4 Amortization paid: (yearly) half-year	ly/quarterly
5 Grace period (in years):	[77]
6 Interest rate (in per cent per year):	L]
[rom year t	Frough /6
foreign loam C	sub-manu
1 Year disbursement starts:	[]
2 Amortization type: constant principal/annu	L
3 Amortization period (in years):	Γ 1
4 Amortization paid: yearly/half-yearl	Y/quarterly
5 Grace period (in years):	ſj
6 Interest rate (in per cent per year):	LJ
from year thi	rough rough
foreign overdraft	sub-menu
1 Year disbursement starts:	۱-:-۱
6 Interest rate (in per cent per year);	<u>[                                    </u>
from year this	rough 16

### 2. GENERAL VARIABLES

COMFAR - DATE
local loam A
I Year disbursement starts:
1 /
2 Amortization type: constant principal annuity profile 3 Amortization period (in years):
4 Amortization paid: yearly half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year / through // through from year through through
local loan B
1 Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 -Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year through through from year through
local loan C
I Year disbursement starts:
2 Amortization type: constant principal/annuity/profile
3 Amortization period (in years):
4 Amortization paid: yearly/half-yearly/quarterly
5 Grace period (in years):
6 Interest rate (in per cent per year):
from year through through from year through
local overdraft
1 Year disbursement starts:
6 Interest rate (in per cent per year)
from year through 10 through from year

	Column	i	3	3	4	5	6	7	8	•	10	11	12
Lines	Investment	Deprec 1 p. s.		Sel. v.	Depr.p. years	Constru per. 1						or/half- per. ?	
1	Lend				-		*******	*****		*******			
8.	Site preparation and development												
•	Structures and civil angineering (a)	<i>5</i> .	/	0	20	207.0						-	
4	Structures and civil engineering (b)												
<b>8</b> .7	ine. fiz. secote (s) constr., transport												
• :	ine, fix, access (b) technology, start-up	6.67	1	0	15	50.0							
•	inc. fiz. essets (c) others												
	Plant, mechinery and equipment (r)	6.67	1	0	15	288.8							
•	Plun:, mechinory and eqipment (b)	12:5	1	0	8	38-0							
10:	Auxiliary & corvice facilities												
11	Pro-production ex- penditures					118.0							
12	Inventory												

8,1 INITIAL FIRE INVESTMENT - (I)ocal

	Columno	i	3	3	4	, ,	6	7	•	9	10	11	13
Lines	Description of investment	Depree	ation type	Sel. v.	Depr.p.	Constru per, 1	ction pho (per. 2	see ——	Plan   par. 4	ning per iper. S	lod = ye  per. 6	er/belf-	}
13	Lend		******		*******			30004 70	******			******	
14	fite preparation and development			******		66							
15	Structures and civil engineering (a)	5	1	0	20	109							
16	Structures and civil engineering (b)				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					******			 
17	ine, fix, secoto (a) constr., transport												
18		6.67	1	0	15	٦.							
10	ine. fiz. eccete (c) cihoro												
20	Plant, mechinory and equipment (a)					45							
21	Fignt, mechinory and eqipment (b)												
22	Augiliory & corvine facilities												
**	Pro-production ex- penditures					22							******
34	Inventory					******						******	}

3.2 CORRECT PLYED LEVESTERT - (f)ortign

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to column and the col	Description of		Sile preparation and development	Structures and civil engineering (s)	Structures and civili	Inc. fix. sessis (a)	inc. fig. sesets (b) lechnology, elett-up	inc. flx. seetle (c)	Plant, sackinery and equipment (a)	Plant, machinery and equipment (b)	Austitiony & service facilities	Pre-production en-	Inventory

(1)0001

Columns  Land  Site preparation of investment  Land  Site preparation and  Gevelopment  Siructures and civil  softnering (s)  Inc. flx. sees; (s)  Plant. sechinery and  equipment (b)  Autiliary a service  facilities  Pre-production services  facilities
1
Columns  Description of investment  Site preparation and development  Structures and civil angineering (a) Inc. fix. assets (a) consir., transport Inc. fix. assets (b) inc. fix. assets (c) engineering (b) Inc. fix. assets (c) engineering (b) Inc. fix. assets (c) engineering (b) Inc. fix. assets (c) fix. fix. assets (c) fix. fix. assets (c) Inc. fix. assets (c) Inc

3.3.1 ANNUAL PRODUCTION COSTS - (f)oreign

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	Description of cost and cost adju. tment liem	Res selected (s)	Raw material (b)	01111110	Bnergy	Labour, direct	Maintenance, repairs	Sprre parts	Pactory overheads	Administration, labour costs	Administration, non-labour	Markeling, labor.	Marketing, non-labour
	Lines	33	23	:	\$	3.	23	:	\$	9	3	:	3

# 3.3.3 STANDARD' PRODUCTION COSTS - (f)oreign

1) 1438.J (20 24. 313 10 1438.J (20 24. 313	9 10	Product D Product E	100 52.141 100 67.24 100 125.76 100			255555555555555555555555555555555555555						;			
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	~	Product A	00/	_											
Ada Land	_		12	2	Raw material (b) 1)	2	 	 Maint. & repairs p.s.	Spare parte p.a.	Pactory overhead p.4.	Admin. lebour p.e.	•	Marketing labour p.a.	<del>.</del>	tetal depres. borne t

.3.1 ANNUAL PRODUCTION COSTS - (1)ocal

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	Columna	1	2	3	1	5	•	7	•	•	10	11	12	13	14	15	16
Lines	Description of cost and cost adjustment item	inflat. 1 p. s.	Prod year 1	u c t t  year 2	O n p	h a s e	year S	year 6	year 1	year I	year \$	yeer 10	year II	Prod year 12	u e t 1  year 13	on P	y
82	Raw material (a)								}								
83	Raw material (b)						Ī	)	1			i i		1			
	Utilities							5	}								<b> </b> -
85	Energy					[											ļ
**	Labour, direct																<b> </b>
87	Maintenance, repairs					[											ļļ
**	Spare parte															<b> </b>	ļ <u>}</u>
**	Pactory overheads																
90	Administration, labour costs																
91	Administration, non-labour															<b>}</b>	
35	Marketing, labour		[		<b> </b>		I									ļ	
93	Marketing, non-labour		[										<u> </u>	1	l	1	l

3.3.2 STANDARD PRODUCTION COSTS - (1)ocal

	Columns		1	2	3	•	3	•	,	•	•	10	11	13
Lines [/l *)	Description of duction costs 1		Prodi value/a		Prod value/a	oct B jvari, l	Prod value/a	uct C  vari. \	Prod value/a	ect D  vari, %	Prod value/a		Produc/s	
94	Raw material (a)	1)	107.53	100	2.657	100	4.236	100	69.48	100	13.362	100		
95	unit cost	2)	1.0	0	1.0		1.0		1.0		1.0			
	Raw material (b)	1)	147.90	100	5.1	100	5.1	100	81.6	100	15.3	100		
97	unit cost	2)	1.0	0	1.0	}	1.0		1.0		1.0			
11	Dtilities	p	10.822	80.619	0.373	80.619	0.373	80.619	5.971	80.619	1.12	80.619		
**	Energy	p.a.	5.757	37.34	0.198		0.198				0.595			
100	Labour, direct		22.472			,						,		
101	Maint, à repairs							03010						
102	Spere parts	p. a.	0.29	0	0.010	0	0.010	0	0.160	0	0.630	0		
103	Pactory overhead	p.a.	3.48	0	0.120	0	0.120	0	1.92	0	0.36	0		
104	Admin, labour	P.4.	47.968	0	1.654	0	1.654	0	26.465		4.962	0		
103	non-lab,													
100	Marketing labour	p.a.												
107	non-lab.	p.a.					******							

	Columns		7	7	7	7			-,			-1::		-1:			
Lines	Description	Inflat	Pro	.	1 0 0			.1					_ _:::		1	1 15	1
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	PRODUCT A							••••••		14				******	••••••		*****
146	Quantity produced/sold	12700	12126	13245	4000	5014	622/	ر ر برخرا	1200	رسر پر ۱	6993	313335		1 2020	ia:a:	18323	
147	Selee price per unit	1	0.318	0.318	0.219	0 318	210	2.666	9017	102.61	07.72	13/1	1.70	1.19.17	8186	12346	. B.48
141	total dates (eg				. اورورو		. מיביא.	. Q.219.	. P.318.	. P. 216-	0.318	.   4:5/4.	Q:313	<u> 0.218</u>	10.50	10.318	. 0.31
141						•	·				- <b></b>	· <del> </del>	•	.		·	·}
130	10101 01111 011, HOUTARL CORES						1			+				· <del> </del>	·	·}	.}
151	Labour coate includ. In 150	<u> </u>	<u>[</u>	1						†	†		·}				
	PRODUCT B							*******		*	1	L			L		l
152	Quantity produced/sold	300	49	102	122	1773	1 18	[ ]	1	1227	T	<b>,</b>	,	,	,	,	,
153	Sales price per unit			103	132	167	1.18.1	1.95	2[]	226	241	1354	266	275	387	188	29
154	Total sales tax		× <del>×</del> .(7.	ASSETT.	PIATE	6.442	6.41%	22.44	0.244	10.244	0.244	0.244	0.244	0.244	0.244	0.244	0.2
135	Total other direct sales costs						f		·	<del> </del> -	<del> </del> -	ļ				ļ	}
									l	<b>∔</b> -			ļ	l			ļ
156	Total other dir, non-var, coats					1	}			1	1					I	
154										<b> </b>		•••••			•••••		<b> </b>
	Total other dir, non-var, coats													,			
	Total other dir, non-var, coats Labour coats includ, in 156 PRODUCT C	300 ]	92	103		<i>W</i> = 1											
157	Total other dir, non-var, coats Labour coats includ, in 156 PRODUCT C	300	82	103	132	167	(8(	195	2/(	226	24/	254	266	275	182	288	293
157	Total other dir, non-var, coats Labour coats includ, in 156 PRODUCT C	300	82. 0.347	103	132	167	(8(	/95 0.343	21(	226	24/	A54 Q:347	266 0.347	275	282 0.347	288	293
157 158 159	Total other dir, non-var, coats Labour costs includ, in 156  PRODUCT C  Quantity produced/sold  Sales price per unit	300	82. a.347	103 0.347	132	167 0.347	(8( 0,342	/95 0.341	21(	22 <b>6</b> 0.347	241 0342	254 0.347	266	275	282	288	293 0.34
158 158 159	Total other dir, non-var, coats Labour coats includ, in 156  PRODUCT C  Quantity produced/sold  Sales price per unit Total sales tax	300	82. a.347	103 0.347	132	167	. (8 ( 0.342	/95 0.341	21(	22 <b>6</b> 0.347	24/	254 0:347	266 0.347	275	282	288 0.347	293

46024681 0.316 0,3% 0.318 4402 4517 6.28 20 798 825 847 0.318 0340 0340 2 1917 2508 2889 31.26 3376 3623 3858 4070 4253 0.318 0.318 0.318 0.318 0.318 ...... 763 0.3% ****** 723 0.360 ..... ..... -----..... ----0.3% 633 679 ...... 0.340 0.340 0.340 0.340 ....... 0.318 0.318 0.318 0.318 ..... 586 -----502 542 .... ....... ...... ..... 358 331 0.340 0.340 0 1442 0.318 164 0.340 850 300 3 A L B 3 000 = . 1 . 0 . 3 -.1005 .... : .... .... Tolel other dir. non-var. other direct sales dir. non-ver. other dir. non-ver. Total other direct sales ٥ = <u>c</u> Labour cools includ. In Quentity produced/sold Quantity produced/eold z < Sales price per unit Lebour costs includ. 00000 Labour costs Includ. Sales price per unit PRODUCT olher direct Total sales ten ⊃ 0 € į ...... Tole! seles tex 000000 price o i her Total 50.100 10101 Total Total ec L = : ... = . 6 9 113 17 0 ~ 1 === 17. 2 111 -17. : --

# 3.5 WORKING CAPITAL REQUIREMENTS

	Columns 1 2 3	
T. 1149	Description Minimum coverage (in of assets/Products/costs Cash liabilities foreign local foreign	in hand

### ASSETS

Accounts receivable/ 30 30 15 15	-
----------------------------------	---

### INVENTORIES

183	Raw material (a):	180	180
184	Raw material (b):	180	180
185	Otilities:	30	30
186 187	Energy:	30	30
188	Spare parts:	360	360
189	Work in progress:	0	0
	Pinished products:	2	2

### LIABILITIES

190	Accounts payable:	30	30	l
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# 3.6 'SOURCES OF PIERROLE - (f)ersign

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Description Figure 1 per 2 per 4 p	EQUITY, SUBSIDIES AND CRANTS  191 Ordinery oberes  193 Quesidies & grants  COANS AND OVERDRAFTS	loan A loan G flow of funds drg.	Lines Description Per. 1 per. 2 per. 4 per. 1 per. 2 per. 4 per. 1 per. 2 per. 4 per. 4 per. 4 per. 5 per. 5 per. 4 per. 4 per. 5 per. 5 per. 6 per. 6 per. 6 per. 6 per. 7 per.		
	EQUITY, SUBSIDIES AN 191 Preference 192 preference 193 eubeidiee a LOANS AND OVERDRAFTS	* * * * * * * * * * * * * * * * * * *	Lines.	138 ordinary at 139 preference 200 subsidies a	201 100m A 202 100m A 203 100m C