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NATURAL ENVIRONMENTAL RESOURCES

ASSESSMENT OF THE FERTILIZER MARKETS IN HAITI: ISSUES AND RECOMMENDATIONS

Porfirio Fuentes FINAL TRIP REPORT

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This publication was produced for review by the United States Agency for International Development. It was prepared by Chemonics International in coordination with Porfirio Fuentes, a senior scientist from the International Fertilizer Development Center (IFDC)

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Preface

From May 30 to June 23, 2012, Porfirio Fuentes, IFDC senior scientist – economics (trade), visited Haiti (under a subcontract to Chemonics International) to evaluate the fertilizer market – in the context of the Fertilizer Subsidy Program (FSP) implemented by the Ministry of Agriculture, Natural Resources and Rural Development (MANRRD) of the Government of the Republic of Haiti (GoH) – with the purpose of identifying market constraints and making policy recommendations to address such constraints. The resulting recommendations suggest options to better implement the FSP without interfering directly with the private sector fertilizer import and distribution but instead support the development of the private sector supply chain to make fertilizer and other inputs available to farmers at the right price, quantity, time and place.

The mission received full support from technical experts and personnel of the Watershed Initiative for National Natural Environmental Resources (WINNER) program in Haiti funded by the United States Agency for International Development (USAID). WINNER is implemented by Chemonics, which provided the logistics while in-country. WINNER personnel made the necessary contacts and established a visit agenda for interviews with government personnel, donors, private sector players in the importation and distribution of fertilizer, agricultural financing institutions and non-governmental organizations (NGOs). They also organized visits to farmers in the Artibonite and Kenscoff regions in addition to agro-input retail stores, primarily those supported by the WINNER program.

The author of this report wishes to thank WINNER personnel Roosevelt Decimus and Phillips Bellerive, for their collaboration during the field work. A special thanks to Robert Estime, chief of party (COP) of the WINNER program, for his support during the visit to Haiti for the implementation of the assessment. Also, special thanks to IFDC personnel involved in the revision and editing of this report.

Finally, it is hoped that Haitian policymakers and the donor community, as well as the agribusiness private sector and other stakeholders, will find this report and its recommendations useful to improve the fertilizer and agro-inputs market in Haiti, and will ultimately make a difference in the livelihoods of the people living in both rural and urban areas.

Acronyms Used in This Report

ASSODLO	Association Haïtienne pour la Maîtrise des Eaux et des Sols
BAC	Bureau Agricole Communal
CRSP	Collaborative Research Support Program
DDA	Direction Departementale Agricole
DR	Dominican Republic
EC	electric conductivity value
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Organization Statistical Database
FAVM	Faculty of Agronomy and Veterinarian Medicine
FERQUIDO	Fertilizantes Quimicos Dominicanos
FERSAN	Fertilizers of Santo Domingo
FLM	Fédération Luthérienne Mondiale
FSP	Fertilizer Subsidy Program
GDP	gross domestic product
GRAMIR	Groupe de Recherche et d'Appui au Milieu Rural
ha	hectares
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
KRII	Kennedy Round II Program (Government of Japan)
LAC	Latin America and the Caribbean
MANRRD	Ministry of Agriculture, Natural Resources and Rural Development
MIS	Market Information Systems
MOU	Memorandum of Understanding
mt	metric ton
NAIP	National Agriculture Investment Plan
NGO	non-governmental organization
ODAV	Organization for the Development of the Artibonite Valley
PDNA	Post Disaster Needs Assessment
PPP	public-private partnership
SOCODEVI	Société Coopérative pour le Développement International
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WINNER	Watershed Initiative for National Natural Environmental Resources (USAID)

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Assessment of the Fertilizer Markets in Haiti: Issues and Recommendations

I. Executive Summary

Haiti is among the poorest countries in the Latin America and Caribbean (LAC) region and the world. Domestic food production has not kept pace with population growth, resulting in high incidences of poverty and hunger. Several factors may have contributed to these trends, including soil nutrient depletion due to deforestation and the lack of sound agronomic practices in agricultural production, which include the limited use of fertilizer and other inputs.

In confronting the challenges of food security, environmental protection and sustainable economic development, accelerated growth in the agricultural sector is essential. However, agricultural sector growth cannot occur without the adequate provision and use of modern agricultural inputs like fertilizer, supplied at cost-effective prices to farmers. The GoH has recognized these problems and in an effort to specifically address the problem of input supply, has been implementing a subsidy on fertilizer for many years.

Despite GoH efforts to subsidize fertilizer and the private sector participation on its importation and distribution under the subsidy program, farmers continue to face difficulty in accessing inputs in terms of price, quantity, place and time. To identify the factors responsible for inefficient input supply systems, the WINNER program commissioned an assessment of the fertilizer market in Haiti with the following criteria:

- Assess the functioning and conduct of the fertilizer market in Haiti.
- Assess the legal and regulatory environment.
- Identify the constraints affecting the performance of the fertilizer market.
- Evaluate financial mechanisms and the potential of public-private financing.
- Suggest actionable measures to improve the functioning and performance of the fertilizer market in Haiti.

An Assessment of the Fertilizer Market in Haiti

The Haiti fertilizer market is not fully developed. Haitian farmers face high prices, limited availability and accessibility (in terms of quantity, place and time) and potentially poor quality products. These tribulations are partially attributed to the erratic government behavior with its ad hoc intervention in the fertilizer market through subsidies. This erratic behavior has discouraged private sector importers and distributors to freely and openly participate in the market. Additionally, there are arguments that the GoH subsidy program has created a dependency syndrome for importers, since private traders normally only participate in the importation of fertilizer required under the subsidy program through contractual obligations. The main result has been a lack of fertilizer product in the market and, consequently, a higher per unit price, despite the subsidy. In addition, it is not clear whether the program has in fact made fertilizer cheaper and more accessible to farmers, or has ultimately achieved the intended purpose of increasing agricultural productivity and production. In light of the typical subsidy program approach of subsidizing the source, it is believed that the subsidy disappears in the domestic market throughout the domestic supply chain and, consequently, does not reach the farmer.

The GoH Fertilizer Subsidy Program

Although Haitian farmers have been receiving subsidized fertilizer since the early 1980s, such subsidy was not official until late in the 1990s when the GoH signed a formal agreement with the Japanese KRII program to subsidize fertilizer for a period of 10 years. According to this agreement, fertilizer would not be offered to farmers in the form of a grant or for free, but instead would be offered at a subsidized price of 70-80 percent below the market price, with a gradual elimination of the subsidy over the 10-year period. The initiative was intended to address economic and social concerns by facilitating access to fertilizer and as an income transfer to farmers. The general objectives of the program were to improve farmers' living standards and to reduce the importation of agricultural products into Haiti (MRNDR, 2011). Consequently, for many years the importation and distribution of fertilizer was in the hands of the GoH under the FSP. The expected beneficiaries were the farmer members of producer organizations.

The expected result of the subsidy program was to increase agricultural production. However, in spite of the subsidy, the production increase has been marginal. In fact, cereal yields declined consistently between 1990 and 2010. The slight increase in production has been

attributed to the FSP, encouraging the GoH to revamp the FSP with additional fiscal funds in 2009 and with donations from the government of Venezuela in 2010. Nevertheless, due to the ad hoc erratic approach of the GoH in the implementation of the FSP as a result of fiscal constraints and the lack of a clear policy and strategy, it is difficult to attribute any increase in overall production to the subsidy program or associate it with an increase in fertilizer consumption. This increase in production despite an overall reduction in yields, infers that intensification by commercial farmers and the expansion of the planted areas (reclaiming idle land and, to a lesser extent, the claiming of new land) by commercial and non-commercial farmers accounts for the increase in production. In light of the marginal effect of the FSP and following the recommendations of FAO, the GoH withdraw from the fertilizer market by suspending the FSP in 2004, leaving the importation and distribution on the hands of private importers.

Following the reintroduction of the fertilizer subsidy in 2009 in response to the food and oil crisis and the devastating earthquake in January 2010, the demand for fertilizer once again increased substantially, so much so that the government no longer had the capacity to meet the increasing demand. In light of this shortfall, the GoH adopted a new implementation modality under which it would allow more participation of the private sector in the importation and distribution of fertilizer. Under this modality, the government provides a subsidy to importers equivalent to 33 percent of the cost of fertilizer delivered at Port-au-Prince. This subsidy is to be gradually reduced until its elimination in a non-specified period of time and is expected to be transferred in full to the farmers in the form of a price reduction at the retail level.

Under this new modality, importers are to supply fertilizer directly to producer organizations and coops without direct government involvement. Subsidized prices are validated by the structures of control (MANRRD) for the quantities necessary to satisfy demands in the different production zones around the country. However, private importers have not been willing to risk their own funds – or perhaps did not have the funds neither access to finance – to import additional amounts required by the market, other than what is demanded by the subsidy program.

There is no incentive for the importing companies to import additional quantities outside the FSP contracts, mainly because of a five percent charge (not considered a tax but a charge to

cover administrative costs) applicable to all products entering the country, including fertilizer imported outside the FSP contracts. This charge makes these imports uncompetitive with the subsidized product in the marketplace. In addition, there are arguments that the government's FSP support has resulted in displacement of commercial fertilizer in the market, while delays in government payments to importers has further discouraged them to even import the quantities contracted by the FSP. As a result, the country has suffered periodic shortages of fertilizer and prices have increased, compelling the government to provide financing to the private sector for importation.

Furthermore, the new strategy seeks to: (a) establish a stock of fertilizer in country to stabilize price and meet unexpected emergencies; (b) to eventually establish a blending plant for added value to the fertilizer consumed in country; (c) to implement measures to avoid the export of subsidized fertilizer; and (d) to look at the possibility of developing alternative organic sources of fertilizer. At the same time, the strategy is to eventually replace the import subsidy with discount vouchers targeted to particular segments of the farming population and to provide the demand pull necessary to develop private sector distribution.

In an effort to improve the management of the new FSP strategy and the delivery of the subsidized product, more recently MANRRD signed a memorandum of understanding (MOU) with fertilizer suppliers to facilitate farmers' access to fertilizer and regulate the market. Among the main points of the MOU are: (a) importers commit themselves to comply with all requirements established by existing Haitian laws and MANRRD; (b) they would only import and distribute fertilizer in the local markets and avoid smuggling across the border while abiding by the prices established by MANRRD; (c) only under special circumstances, MANRRD will obtain the necessary franchise from the Ministry of Economy and Finance for importing fertilizer; and (d) MANRRD reserves the right to make unannounced visits to the sites where fertilizers are imported to effectively monitor their importation.

There are different points of view on how to efficiently administer the FSP. Some believe in the combined role of government and the private sector in fertilizer acquisition and distribution under the FSP. Others believe that the government's role in the market should be

constrained to regulations and issuing policies that allow private sector development and consumer protection, and that actual importation and distribution is the role of the private sector. It is also argued that given the inability of the private sector to supply the quantity needed in the market at the right price, time and place, it is necessary for government intervention. The counter argument to this last position is that the inability of private importers and distributors to supply the market is due to the government's interference in the supply-side of the market. In addition, the government's neglect of macro- and micro-economic policies and an underinvestment in public infrastructure further limits the efficient operation of private market players.

Regardless of the different arguments, there is widespread belief that fertilizer subsidies are essential for food security in Haiti since the amount of fertilizer consumed at the farm level is low. The inability of Haitian farmers to afford inputs is directly related to the low prices received for farmer outputs due to lack of domestic market access. However, government intervention through imports and distribution of fertilizer is not sustainable over time because of its dependence on foreign aid and fiscal constraints. In addition, the government faces human resources and technical (know how) constraints to implement a well-managed program. Still, there are concerns that a decrease in subsidies will likely decrease fertilizer use. MANRRD officials are also concerned about how they will pay for subsidies in the future when aid funds are no longer available. As a consequence, a decrease in agricultural production is expected unless rising fertilizer prices are countered by increases in agricultural output prices.

There are other constraints affecting the conduct and performance of the private fertilizer market that can be categorized in three broad groups: macro-economic structural constraints, market development constraints and technical constraints.

Macro-Economic Structural Constraints – The main macro-economic constraint facing Haiti is poor rural infrastructure, primarily roads and productive infrastructure, most of which were damaged after the 2010 earthquake. This limits agricultural productivity and production and therefore the use of agricultural inputs, the effective delivery of inputs to farmers and farmers' outputs to markets (limited domestic market access) by increasing transaction costs.

Market Development Constraints – Market development constraints relate to the legal and regulatory framework, policies, human capital, access to finance and market information. An assessment of these factors revealed that the country lacks a legal and regulatory framework. The policy environment is non-conducive for business development, human capital is inadequate and access to finance and market information is limited.

Technical Constraints – Technical constraints encompass inadequate research and extension; limited work on soil characterization, classification and mapping; and basic research with fertilizer trials to develop sound fertilizer recommendations. That is in addition to insufficient knowledge among farmers and dealers regarding the proper use and sale of productive inputs. An important technical constraint that must be addressed is related to the right type of fertilizer in the market according to Haiti's soil and crop requirements. Formulations available in Haiti are not based on the actual soil and crop needs in Haiti, but presumably are the same developed and used according to the Dominican Republic (DR) conditions without accounting for soil differences, particularly in terms of more pronounced soil nutrient deficiencies in Haiti.

Measures Needed to Strengthen the Functioning and Performance of Fertilizer Markets in Haiti

In light of the shortcomings and issues faced by the fertilizer market in Haiti, and as a matter of recommendation in the framework of such constraints, this report proposes a comprehensive national plan to support the development of the fertilizer market. Under this plan, the key action is to allow for an active participation of the private sector with minimum government intervention in the supply-side of the market. This proposed plan also includes a modification of the subsidy program under the basic principle of directly supporting the user and the product (at the demand end of the market), rather than the source (or the supply-side of the market). However, any support to the supply-side of the market should be indirect, by creating an environment conducive for agribusiness development.

Priority Strategic Actions

In order to promote the use of fertilizer and its availability, accessibility and affordability, it is necessary for the GoH to adopt the following actions:

Short-Term Actions

Establish an Enabling Legal and Regulatory Environment – At the core of a market development strategy is the establishment of a clear legal framework to guide and regulate the fertilizer market, especially the processes of importation, production and use, while incentivizing consumption and increasing agriculture productivity and production.

Improve the Implementation of the FSP, under a market-friendly strategy where the roles of government and private sector are well-defined. Fertilizer procurement, importation, transportation and distribution must be the role of the private sector, given the already established structures and mechanisms for performing such a role. The GoH's role should be to: (a) create a conducive policy and macro-economic environment for the private sector to perform its expected role of supplying inputs like fertilizer, whether subsidized or not; and (b) provide purchasing power support to farmers to incentivize demand under the basic principle of a fertilizer subsidy strategy to “support the user and the product, not the source.”

The strategy must include:

1. A fast track subsidy program transition period of up to five years.
2. Use of targeting instruments focusing on farmers who are most likely to make the transition from subsistence to commercial farmers to expedite their graduation from the FSP, and then focus on those most in need of support.
3. A time-limited intervention, which implies developing and adhering to a subsidy program exit plan.
4. The implementation of subsidy effectiveness-enhancing measures by addressing the market failures that restrict the availability and accessibility to fertilizer by farmers.

This strategy is expected to improve the affordability and accessibility of fertilizer even by resource-poor farmers, while they develop the culture and realize the benefits of using fertilizer in their crops. At the same time, the strategy will allow the private supply sector to realize the benefits of market expansion.

Establish a Temporary Blended Fertilizer Buffer Stock – Creating a fertilizer buffer stock ensures that fertilizer is supplied and available to consumers for timely use in the fields while helping regulate or stabilize fertilizer prices in the domestic market at least during the transition period. Initially, the program should be implemented by the GoH utilizing a public-private partnership (PPP). A fund should be established under the PPP to serve all players in the fertilizer market. The private sector will be allowed to buy fertilizer at cost from the buffer stock for distribution throughout the country.

Short- to Medium-Term Actions

Improving Production Infrastructure and Market Access – One of the key public works that can help increase the flow and use of fertilizer in Haiti is an improved road network. Policy measures must be implemented to restore existing roads, in addition to building new feeder roads and other transportation infrastructure to expand the existing distribution network. With this action, the GoH has the potential to reduce transaction costs and increase the flow of agricultural inputs to farmers, as well as farmer outputs to domestic markets. In addition, it is recommended to rebuild and expand production-enhancing infrastructure damaged during the January 2010 earthquake, such as irrigation, which is essential for farmers to make effective use of fertilizer.

Provision of Research and Extension Services – The government must revive or revamp and intensify the research and extension services to include research on soil classification, characterization and mapping. Implementing research to determine fertilizer rates according to crops and soils, application techniques and other relevant practices must be done.

Improve Skills and Knowledge in Fertilizer Use – It is recommended to implement a training program to enhance integrated utilization of organic and inorganic fertilizer and related inputs in economically and environmentally sound ways. Training must be extended to the various players in the fertilizer chain, mainly extension workers, agro-dealers and retailers. Training for farmers in the handling, management and proper use of fertilizer and other inputs is vital.

Promote Integrated Use of Organic and Inorganic Fertilizer – It is recommended to encourage integrated soil fertility conservation farming through the use of both inorganic

fertilizer and organic sources of nutrients. These efforts will improve the biophysical properties of the soil, water infiltration and restore organic matter content to the soil while improving the cationic exchange in the soil. This will increase the soil's capacity to retain nutrients and improve fertility, which eventually can increase soil productivity in a more environmentally friendly and sustainable way.

Medium-Term Actions

Formation of Farmer and Agro-Dealer Associations and Cooperatives – The concept of associations and cooperatives can be used as a strategy for farmers and agro-dealers to operate as a group rather than individually, to take advantage of economies-of-scale by pooling resources and optimizing their buying and selling power. In addition, they will be in a position to strengthen their collateral security for accessing credit facilities to procure greater quantities of inputs.

This strategy of forming associations becomes highly relevant to ensure the sustainability of the farmer groups and agro-input retail stores supported by the USAID/WINNER program once the program has ended (see Annex 1 in the report).

Improve Fertilizer Credit Systems – One way that the fertilizer credit system can be improved is by establishing a National Fertilizer Agricultural Fund. This credit system can be a PPP that will put in place mechanisms for minimizing the willful default element among credit beneficiaries. This will prevent individuals from obtaining a number of loans simultaneously from several different lenders or using different names to access new loans while in default on outstanding loans. The fund should also be integrated with other in-country initiatives that are underway to reduce credit default risk. Risk management instrument tools (e.g., crop-indexed insurance) to reduce credit default as a result of natural disasters, such as excessive rains or droughts, should be developed.

Medium- to Long-Term Actions

Facilitate the Establishment of a Fertilizer Blending Plant – Domestic blending of fertilizer could potentially be an effective way of reducing the high cost of fertilizer and facilitate

its access to smallholder farmers. This can also act as a long-term alternative to a blended fertilizer buffer stock. As the quantity of fertilizer consumed in Haiti increases, the feasibility of establishing an in-country blending plant should be explored. Initially, a PPP should be promoted to allow the private sector to utilize public market and storage infrastructure for this endeavor. It is recommended that the operation should eventually be a wholly private sector operation. The Ministry of Finance should consider allowing a tax holiday for a period of five or more years to encourage private sector investment in the blending plant.

Develop Market Information Systems – For all market players to make informed decisions, information asymmetry should be reduced in the fertilizer market. There is a need for establishing or improving existing market and fertilizer information systems, making such information available to importers, distributors and farmers for profitable decision-making.

Establish Plant Nutrient Requirement Based on Knowledge of Soils – It is recommended to engage in research to determine soil characterization, classification and mapping, which according to the literature, has never been done in Haiti. These soil classification studies should be complemented by research on crop response to fertilization based on fertilizer trials on soils that have similar characteristics.

Conclusions

- The development of input markets is the beginning of agricultural intensification and national economic growth. A well-functioning open market will lay the foundation for productive and prosperous agriculture in Haiti.
- A well-functioning private sector led market can be established with strong government commitment and long-term donor support.
- Provided the proper macro-economic, market and policy conditions as recommended in this report, the private sector will be able to realize its full potential to properly serve the fertilizer market and other market needs of the agricultural sector in Haiti.

Assessment of the Fertilizer Markets in Haiti: Issues and Recommendations

II. Introduction

The agriculture sector in Haiti plays an important role in the country's economy by providing livelihood and social support to millions of people living in rural areas. Yet, due to poor resource management – mainly soil and water – productivity of the sector remains low. Many people who depend on agriculture suffer from poverty, hunger and malnutrition as soils become increasingly depleted of the most important nutrients. This suffering will continue unless the government, the agribusiness private sector and the donor community all take decisive actions. To face these challenges, the Haitian agriculture sector must be modernized. The use of inputs, such as inorganic and organic fertilizer, along with improved seeds and modern agricultural production techniques and practices, should be introduced, especially among the millions of smallholder and subsistence farmers. However, the use of these inputs cannot be increased unless well-functioning agricultural markets are developed and operational.

To aid in understanding the dynamics of the Haitian fertilizer market, the USAID-funded WINNER program contracted IFDC to implement an assessment of the market, identify its primary constraints, make recommendations and prepare an action plan to address the identified constraints. For this assessment, an IFDC consultant traveled to the cities of Port-au-Prince and the administrative regions of Artibonite and Kenscoff where he interacted with stakeholders from the public and private sectors, non-governmental organizations (NGOs), the donor community, farmers and agro-input store managers.

This assessment, along with the recommendations and action plan, provides a blueprint for the development of functional fertilizer and agro-input markets in Haiti. Considering the state of market development in the country, this report suggests a holistic approach for market development, taking into consideration legal and regulatory frameworks, policies, infrastructure, human resource development, finances and market access.

The action plan also makes a proposition to modify the delivery of the fertilizer subsidy under a new market-friendly modality that does not interfere with the normal conduct of private sector importation and distribution. The recommended alternative subsidy program is in support of the private sector performance, especially if implemented in a holistic framework. This approach is applicable in the context of Haiti's market situation, given the undeveloped markets, and encompasses public-private partnerships (PPPs) for the development of fertilizer and other agro-input markets.

Initial impressions of the assessment and recommendations were discussed at a debriefing at the USAID/WINNER offices in Port-au-Prince, where the contacted stakeholder and donors were invited. To the extent possible, comments received during this discussion have been incorporated in this report.

A. Haiti Country Background

Haiti, one of the poorest countries in the LAC region, is located on the western part of the island of Hispaniola, shared with the Dominican Republic. The country is divided into 10 *departments* (or administrative regions) with 136 *communes* (municipalities) with Port-au-Prince as the nation's capital. The per capita gross domestic product (GDP) presumably increased to about \$1,190 by 2011 (according to World Bank indicators), in spite of its negative GDP growth during 2010 due to the earthquake. Haiti's economy is heavily reliant on Diaspora remittances, which represented between 23 and 30 percent of GDP in 2010 (Haiti PNDA 2010). Income inequality in Haiti is among the highest in the LAC region, with a Gini coefficient of 0.59, ranking 158 out of 187 countries in the 2011 United Nations Human Development Index.

The main industries are sugar, flour, textiles, cement and other small industries that rely on imported prime materials. Based on the Economic Commission for Latin America and the Caribbean (ECLAC), international commerce activity amounts to \$4.7 billion, of which 80 percent represents imports and 20 percent represents exports. The main trading partners in terms of exports are the U.S., Canada and France, with manufactured products like garments, coffee, cocoa and essential oils. In terms of imports, primary trade partners are the U.S., Dominican Republic and China, supplying mainly cereals, agricultural and transportation equipment and other raw materials for various industries.

With a population of nearly 10.12 million, Haiti is the second most densely populated country in the LAC region – with 306 inhabitants per km² and an estimated growth rate of 2.2 percent per year. In 2010, the country had an economically active population of 4.8 million, out of which 2.25 million were involved in agriculture as their main economic activity. Almost 60 percent of its population is predominantly rural.

Table 1. Total and Rural Population by Department

Department	Number of Communes	Population	Share of Total Population	Share of Rural Population in Department	Rural Population	Share of Rural Population
Artibonite	14	1,070,397	13.4%	74.0%	792,094	16.7%
Centre	12	565,043	7.1%	83.9%	474,071	10.1%
Grande-Anse	20	603,895	7.6%	85.1%	513,915	10.9%
Nord	20	773,546	9.8%	61.8%	478,051	10.1%
Nord-Est	13	300,493	3.8%	62.5%	187,808	4.0%
Nord-Ouest	13	445,080	5.6%	77.0%	342,712	7.2%
Ouest	17	3,093,699	39.0%	33.1%	1,024,014	21.6%
Sud	20	627,311	7.9%	84.3%	528,823	11.1%
Sud-Est	10	449,585	5.7%	85.4%	383,946	8.1%
Total	136	7,929,049	100%	59.6%	4,725,434	99.8%

Source: Population, 2003 Census.¹

With a high rate of unemployment (estimated at 40 percent), poverty is of great concern; 78 percent of the overall population lives in poverty, of which 49 percent are considered extremely poor.² Given the predominance of the rural population, poverty is more pronounced in rural areas.

Table 2. Poverty Rate by Locality and Region, 2001

Ouest	Sud-Est	Nord	Nord-Est	Artibonite	Centre	Sud	Grand-Anse	Nord-Ouest
28.9	56.6	62.7	80.3	58.6	55.6	63.0	60.8	65.0
Total Haiti		Metropolitan		Urban		Rural		
48.9		19.7		56.3		58.1		

Source: Diagnostic and Proposal for Agriculture and Rural Development Policies and Strategies, 2005.

¹ In Diagnostic and Proposal for Agriculture and Rural Development Policies and Strategies, 2005.

² Poverty is defined as follows: extreme poverty is less than US \$1 per day and poor is less than \$2 per day.

Poverty is far-reaching, not only in terms of location and per capita income but also in terms of access to assets and services, as evidenced by poor multidimensional social indicators such as literacy, life expectancy and infant and maternal mortality. The recent resurgence in food price ‘volatility’ and food-induced inflation contributed further to the deterioration of the population’s nutritional status, where 30 percent of children suffer from chronic malnutrition and 50 percent of women are anemic. Food accounts for a large share of the family budget for poor and urban wage earners, and higher food prices have led people to switch to cheaper, higher calorie foods (i.e., fats and simple sugars).

B. Haiti Agricultural Sector and Rural Economy

Haiti is a tropical country with a total land area of 27,750 km², characterized by rough topography that consists of mostly mountainous terrain with slopes greater than 40 degrees; about 20 percent (550,000 hectares [ha]) of the surfaces are plains. The climate is characterized by high rainfall mixed with semi-arid areas along the coast that experience periodic droughts. Based on its diverse climate, with precipitation between 800 mm and 2,500 mm per year and an average temperature of 23°C, the country can be divided into at least three agro-ecological zones with high production potential. They are: (a) humid highlands, which encompass rainfed hill and mountain agriculture; (b) irrigated and rainfed lowlands; and (c) semi-arid zones, which encompass dry lowland and dryland hill and mountain agriculture. Irrigated agriculture, covering about 92,000 ha of land, is mostly concentrated in the Artibonite region and associated with rice production.

Out of 1.05 million ha total land area, 38.1 percent (400,050 ha) is arable land. The actual cultivated area is above 40 percent, of which approximately 72,000 ha are marginal lands. Much of these cultivated lands are underutilized, with low yields and underperforming agriculture as a result of obsolete production techniques. The sector’s underperformance is exacerbated by recurrent flooding and other natural disasters, given that Haiti is located in the middle of the ‘Hurricane Belt’ of the Caribbean and is subject to severe storms between the months of June and October. Furthermore, in rural areas, particularly in mountain zones, deforestation has been rampant. Much of the forested land (estimated at 98 percent of total forest) has been cleared to make room for agricultural activity and for wood to be used as lumber and fuel. This activity has created barren land, causing unprecedented erosion, with the topsoil being washed away for an annual loss of 3 cm per year. By 1990, according to the Association Internationale de Developpement, the erosion

rate was estimated at 12,000 ha/year. These conditions have caused the soils to be almost completely depleted in terms of nutrients and topsoil organic matter, which are required for sustainable agricultural production activities.

In spite of these shortcomings, agriculture is the main sector of the national economy and a potentially major source of growth for the country. The total value of agricultural exports amounts to about US \$25 million per year, representing 5.2 percent of the total export value. In recent years, agriculture has contributed about 28 percent to the national GDP (a decline from 40 percent in the 1990s). It is the principal source of revenue and employment to more than 50 percent of the overall population (66 percent of employment in rural areas and 75 percent of employment in low income households). It is also responsible for about 50 percent of the available food in-country. The remainder of the country's food needs, not typically met by the sector due to its weak performance, is imported. As much as 80 percent of food is imported, making Haiti a net importer of food. In 2009, Haiti's annual production ranged between 380,000 and 455,000 metric tons per year (mtpy) (FAOSTAT). In 2009-10, Haiti spent US \$805 million on importing agricultural products.

1. Soil Situation in Haiti

The soils in Haiti are poor in terms of nutrients and organic matter, mainly due to the effect of wind and pluvial erosion. In some regions, soils are of calcareous origin, and therefore have a high pH. The organic matter content varies significantly, between 1.86 and 9.5 percent. Furthermore, analyses have shown that the soil electrical conductivity (EC value) is low, which implies that Haitian soils are subject to excessive leaching, a factor that is important for the retention of phosphate, potash and many secondary nutrients. An analysis of samples collected by the Taiwanese mission to Haiti showed that soils have recurrent deficits of nitrogen (N) and phosphorus (P) – 62 percent –, in addition to zinc (Zn) and iron (Fe). These deficiencies greatly affect the quality and productivity of flooded rice, where it is most visible.

Anecdotal reports indicate that as a result of soil fertility and organic matter loss in some regions of Haiti, it is almost impossible to produce rice, maize or beans without using inorganic fertilizer. In other areas, when farmers began cropping new plots, they were able to do so without using inorganic fertilizer (organically), but with continued cropping, they were eventually compelled to use fertilizer and other inputs in order to ensure continuous yields.

2. *The Farm Subsector*

Due to the predominance of the rural population, farming remains the main economic activity. Farmer's livelihoods and survival strategies face the dilemma of producing for monetary revenues or food for subsistence, where risk mitigation drives their decision processes. The rural poor receive the largest share of their total income directly from agricultural activities such as farming and as laborers. About 55 percent of the economically active population participates in agriculture as laborers; 33.7 percent are women (FAO, 2009).

The prevailing farming systems comprise a wide array of crops, typically cultivated over small land holdings consisting of tiny scattered plots. Agricultural output has suffered from a growing population that farm in a finite area of land. The result has been the division of cultivated land into smaller and smaller plots. By 2006, about 80 percent of Haiti's farmers had an average lot size of less than two ha, and half of the population owns less than one ha of land (UNCTAD, 2006). Most subsistence farmers are confined to fragile lands, defined as arid and steeply sloped, thus accelerating soil degradation on a routine basis. Consequently, the soil has become progressively exhausted and less productive.

Furthermore, the land situation in Haiti is also characterized by an increasing difficulty of access and a prevalence of informal management, leading to land-holding insecurity. Nearly 75 percent of rural land is used by small farmers under informal arrangements, the basis of which are habits and customs, and therefore cannot be used as collateral for agricultural credit.

Table 3. Land Distribution in Percentages, by Plot Size in Haiti, 2001

Land Area	Artibonite	Centre	Grand-Anse	Nord	Nord-Est	Nord-Ouest	Ouest	Sud	Sud-Est	Total Haiti
0-0.5 ha	22.5	12.7	14.0	42.0	23.4	16.3	18.5	27.6	19.6	21.5
0.5-1 ha	32.7	25.8	27.5	28.4	33.0	26.5	31.1	28.2	25.4	28.6
1-2 ha	26.6	32.8	28.4	18.0	25.9	31.6	24.7	27.8	30.3	27.6
2-4 ha	11.2	19.7	13.1	7.6	11.7	15.9	15.7	9.8	17.3	13.7
4-7 ha	2.7	5.2	10.2	2.0	3.6	5.9	4.9	4.4	4.7	4.9
7-10 ha	1.7	2.0	3.2	1.0	2.5	2.1	2.4	1.9	1.3	2.0
10-20 ha	1.5	1.7	2.7	0.8	0.0	1.5	1.8	0.2	0.4	1.3
> 20 ha	1.0	0.2	0.9	0.3	0.0	0.2	0.9	0.2	0.9	0.6

Source: Diagnostic and Proposal for Agriculture and Rural Development Policies and Strategies, 2005.

Given the climatic conditions, Haiti has the potential for production of a wide range of agricultural products. The key food crops include beans, maize, sorghum, pigeon pea, rice, cowpea, cassava, sweet potato and plantain bananas. In each of the agro-ecological zones, however, there are 'lead' crops with potential value added, which can serve as engines of growth and become the catalyst for producing a wide range of products for farmers' subsistence, with surplus that could go to both domestic and international markets. Other crops grown in Haiti in addition to the key food crops include: basic legumes, roots, tubers, dessert banana, yam, taro, breadfruit, jackfruit and Irish potato. Some vegetables include: cabbage, tomato, eggplant, leaf amaranth, watermelon; fruit trees grown are: mango, papaya and acerola. Select crops for export are coffee, cocoa and some edible oils.

Many farms combine the production of fruit trees and root crops with the more common grain crops. However, typical farmers in Haiti do not have access to new or improved technologies or even access to basic production implements other than hand tools. Due to the low technological practices of Haitian peasants, in addition to the decline in soil quality and the low availability of agricultural inputs, agricultural productivity and production have been declining, estimated at about 0.5-1.2 percent per year over the last 10 years. Average cereal yield for the period 2007-2011 is 973 kg/ha relative to 4,342 kg/ha in its neighbor the DR (WB Indicators 2001-07). For the same time period, the total average production of cereal in-country was 457,587 mtpy, a quantity that was not enough to cover total domestic demand and down from 520,000 in 2007. Consequently, the government has been compelled to import large quantities of cereals to cover the food deficit and satisfy the needs of the poor population.

Table 4. Planted Area, Yields, Production and Value of the 15 Main Crops Produced in Haiti

Crop	Planted Area		Yield		Production		Value of Production	
	ha	Rank	kg/ha	Rank	mt	Rank	US \$ ('000)	Rank
Maize	280,000	(1)	785	(13)	219,800	(8)	27,143	(10)
Cassava	120,063	(2)	3,895	(8)	467,645	(2)	44,151	(6)
Sorghum	120,000	(3)	875	(12)	105,000	(10)	8,498	(14)
Peas	102,411	(4)	757	(14)	77,525	(11)	44,204	(5)
Sweet Potatoes	101,258	(5)	2,685	(9)	271,878	(5)	20,513	(12)
Coffee	90,397	(6)	527	(15)	47,639	(13)	51,212	(4)
Yam	58,582	(7)	5,234	(5)	306,618	(3)	78,210	(3)
Rice	57,500	(8)	2,230	(10)	128,225	(9)	34,296	(8)
Bananas	51,501	(9)	5,520	(4)	284,286	(4)	80,067	(2)
Mango	41,121	(10)	5,948	(3)	244,588	(6)	146,560	(1)
Plantain Bananas	37,910	(11)	6,040	(2)	228,976	(7)	38,061	(7)
Tubers	27,281	(12)	2213	(11)	60,373	(12)	10,328	(13)
Sugarcane	18,500	(13)	60,000	(1)	1,110,000	(1)	25,284	(11)
Avocadoes	10,471	(14)	4,228	(7)	44,271	(14)	30,684	(9)
Citrus	8,029	(15)	5,137	(6)	41,245	(15)	7,972	(15)

Data source: Report of the Initial Evaluation of the Project for the Creation of a Fertilizer Blending Plant in Haiti, Taiwan Embassy, 2011.

The previous table shows an increase in production for some crops (maize, rice, sorghum, coffee, sugarcane) relative to 2000 production, although some of this production is still lower than 1970s production as presented in Table 5. According to these statistics, the most planted crops in terms of area are maize, cassava and sorghum, followed by peas and sweet potatoes. In terms of yields, the most important crops are sugarcane, plantain bananas, mangoes, bananas and yam. The most produced crops are sugarcane, cassava and yam, followed by bananas and coffee. In terms of value, major crops are mango, bananas, yam, coffee and peas. Based on these figures, we can observe that among the crops with the highest yields are commercial and cash crops such as sugarcane, bananas, mango and yam; some of these crops like mango, bananas and yam have the highest cash value.

Table 5. Haiti Agricultural Production, 1970-2000 (in '000 tons)

Crops	1970	1980	1990	2000
Maize	240	180	163	182
Rice	53	80	87	76
Sorghum	210	121	68	91
Legumes	83	85	99	75
Coffee	24	43	37	25
Sugar (cane)	4,230	5,642	1,500	800
Cotton	4	6	–	–
Roots and tubers	592	690	770	770
Bananas and plantains	395	500	530	612

Sources: FAO; CNSA (2000) in Diagnostic and Proposal for Agriculture and Rural Development Policies and Strategies.

The prospects for rapid crop production increases and the adoption of new cropping systems are strong, all the more because current levels of technology are extremely low.

The role of non-farming activities and income sources is significant in Haiti, a consequence of the reduction in agricultural production. About 78 percent of households with access to land also have access to non-farm jobs and incomes. Thirty-seven percent of rural workers are engaged in non-farm activities, generating nearly 50 percent of rural household income from non-farm sources. Rural dwellers also work as laborers in the off-farm and non-farm sectors where they generate about 26-34 percent of their income. Remittances from urban areas and from abroad, account for about 14 percent of poor rural household incomes. Median income varies greatly across regions and locations.

3. Latest Situation of the Agriculture and Rural Sectors

The state of the Haitian economy has long been affected by sequential political crises and security turmoil, which have been exacerbated by a series of devastating natural disasters. In spite of political crises and security turmoil during the years preceding the devastating January 2010 earthquake, Haiti experienced a stable and encouraging macro-economic environment, albeit a risky one. The earthquake represented a major setback to the economy and aggravated an already precarious social situation. Economic growth for 2010 is estimated at negative 5.4 percent.

The earthquake affected private sector economic activity disproportionately because it occurred near the Port-au-Prince area, where 65 percent of the country's economic and industrial activity is concentrated. According to the Post Disaster Needs Assessment (PDNA), the country suffered damage and losses estimated at US \$5.7 billion. Damages and losses to agriculture were approximately US \$146 million. During the 2011 early spring agricultural campaign following the earthquake, a drought affected part of northern Haiti, contributing to a more than 20 percent decline in major crop yields; farmers' incomes decreased dramatically, seriously compromising the following planting seasons. In early fall of 2011, heavy rains struck the Sud, Grande-Anse and Nippes Departments. The floods, compounded by rising food prices in local markets, significantly impacted the capacity of 30,000 farming families to produce and access food.

Today, Haiti continues attempts to recover from the earthquake, droughts and floods. The immediate effect of earthquakes on households and agriculture is multidimensional. Key indicators show that earthquake effects on agriculture are stabilizing. The major lingering overall agricultural activity focused on small rural commerce activity managed principally by women, which has decreased by up to 91 percent. Rural household size increased from 6.4 to 8.7 persons, affecting food consumption, which decreased from 2.6 to 1.6 meals per day.

Enabling rural communities to build healthy farming and food systems is a key to food security. Farmers in rural and peri-urban areas are among Haiti's poorest. They lack access to the basic materials and services needed to enhance food security, such as high-yielding seeds, fertilizers, livestock support, credit and knowledge of improved farming methods. Women – the main producers of food in Haiti – are central to raising household food security levels.

C. Policies

In spite of the negative effects resulting from the earthquake, droughts and floods, the agriculture sector showed positive growth of 1.12 percent by 2011. Still, weakened by recurrent crises, food insecure groups have low levels of resilience to shocks and are in constant need of support. Haiti's agriculture sector is very fragile and food insecurity remains high in most departments, with particularly alarming levels in the Artibonite, Nord-Ouest, Sud-Est and Sud departments.

At least in the short- to medium-term, agriculture can play a major role for economic recovery and as a key engine of rural growth and development. Consequently, for demographic and economic reasons, development of agriculture in the rural areas is of particular importance to Haiti. Supporting the agricultural sector can produce multiplier effects for the rest of the rural economy and make strides toward food security and social stability. Increasing production is a key objective of the government's reconstruction efforts, which have policy implications.

1. Agricultural Sector Institutional Context

Over the last decade, the Haitian government has pursued sound macro-economic policies. It has substantially reduced its budgetary deficit while pursuing monetary and exchange rate stability to contain inflation, with some degree of success. However, neglect and the resulting chronic underinvestment in the rural economy (e.g., infrastructure, public services and programs) and ineffective natural resource management have steadily depleted the rural production base.

The budgetary allocation to MANRRD, already low in 2001 at eight percent of total government spending, dropped further to three percent by 2008. This figure is low considering the neglect and deficit of the government investment in the agriculture and rural sector and given the fact that a high percentage of the population and the country's economy are heavily reliant on the agricultural sector. Trade liberalization in the 1990s included no transitional or pro-active export measures, which immediately made Haiti one of the most open markets in the LAC region, yet left the rural economy without the means to adjust and facilitate labor market shifts. Underinvestment in rural public goods has been compounded by weaknesses in MANRRD's capacity to collect and analyze sector data or work with stakeholders in establishing priorities for investment based on clear technical criteria.

Since the earthquake, MANRRD and development partners prepared and agreed on a National Agriculture Investment Plan (NAIP) for 2011-2016. The NAIP not only derives its objectives and strategy from the existing National Agriculture Policy 2010-2025 but also from the PDNA and the overall government and international response to the post-earthquake reconstruction efforts. The NAIP has three components (or axes of intervention) in the rural agriculture sector:

1. Development of rural infrastructures, including irrigation.

2. Production and development of competitive markets that include access to farm inputs, machinery and rural credit.
3. Agricultural services and institutional support such as extension services and land tenure rights.

The following objectives are targeted:

1. Increase the productivity and the competitiveness of the agricultural sector.
2. Augment by 25 percent the contribution of agriculture to national food availability.
3. Reduce by 50 percent the number of people who suffer from food insecurity by 2015.
4. Improve the health conditions and nutrition of the people, focusing on vulnerable groups.
5. Increase the agriculture income of at least 500,000 households.
6. Increase the generation of foreign currency.

To facilitate these broad national goals, the development objective for this operation is to increase small farmer access to modern agricultural inputs, extension services and training in animal husbandry and plant health in priority regions. Additional objectives are to strengthen MANRRD's capacity to further define and implement the National Agriculture Extension Strategy (PDVA) and to provide financial assistance in case of an agriculture sector emergency.

2. Agricultural and Fertilizer Policies and Political Environment

The government, within the context of agriculture and rural development policies, is supporting agricultural development, given its relevance in terms of contribution to GDP and the number of rural people who make their livelihood from agriculture. Therefore, there is a strategic reason to support the agriculture sector from both economic and social perspectives.

In the context of this support, the government has identified the need to increase agricultural production in an effort to increase food security and rural household incomes and to reduce or eliminate dependence on food imports. To increase production, the government identified fertilizer as a key agro-input; consequently, a fertilizer subsidy was introduced. In light of the earthquake and in an effort to intensify agricultural production in response to a sudden increase in the food demand in rural areas, the MANRRD doubled its efforts to maintain the fertilizer subsidy. This was to be a short-term measure, with the subsidy level determined by international market prices and the effective purchasing power of the farmers.

III. An Assessment of the Haiti Fertilizer Market

A. The Importance of Fertilizer in Haiti

Fertilizer constitutes an effective and immediate source of plant nutrients to increase yields while improving food nutritional quality. In addition, fertilizer is an essential input along with seeds, crop protection measures, technical training and assistance and other services to augment food and other crops production, to address the issue of food insecurity in Haiti and to generate foreign currency through exports.

In Haiti, the need for the use of fertilizer has been heightened by the continuous cultivation and deforestation of land. Most of these lands are marginal and have been neglected in terms of soil nutrient and organic matter restoration. These nutrients and organic matter have been lost during crop production and extraction of crop residues and natural resources (e.g., deforestation). In many cases, the remaining organic biomass from harvests (stalks, leaves, etc.) is taken from the field for alternative uses rather than being reincorporated into the soil. These practices have resulted in soil degradation and the consequent loss of productivity. Therefore, there is an urgent need to use nutrient supplements to improve fertility and soil structure. The most common source of nutrient supplement for the soils is inorganic (or mineral) fertilizer, although alternatively there are organic sources of nutrients such as manure and composts.

The use of fertilizer in Haiti can also be justified because of limited land and high population density. Provided that there are extensive areas of land with a low population density, it is possible to farm with little to no fertilizer using traditional practices under shifting cultivation (crop rotation or intercropping) and fallows that allow natural vegetation to return to its native state and for the soil to ‘rest’ and regain, or at least maintain, its fertility. However, Haiti does not have sufficient arable land, but does have a high population density even in the rural areas. Thus, it is not possible to practice a cropping system based on fallows.

In Haiti, even land that is referred to as fallow is often heavily grazed, leaving little biomass for soil organic matter and fertility restoration. Under degraded soil conditions, productivity can only be restored through improved soil management, which includes replenishing organic matter and nutrients to the soil. These practices could include the recycling

of crop residues and/or other organic byproducts, as well as intercropping with N-fixing legumes whenever possible. In the meantime, the use of chemical fertilizers is necessary in Haiti to correct soil nutrient deficiencies and to supplement nutrients supplied from other sources.

B. The Haiti Fertilizer Market

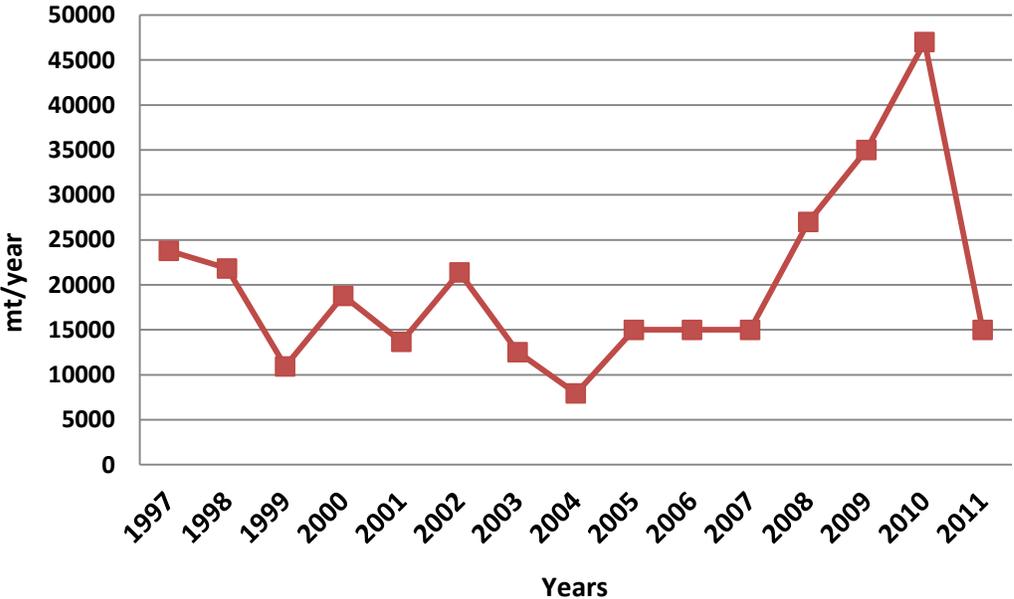
According to private sector importer representatives, the fertilizer market in Haiti is a free open market, since virtually anyone who is financially capable and has the logistics necessary to import and distribute fertilizer can do so. However, given the GoH involvement in the market, which has brought a high level of instability, no one imports unless there is a guarantee of purchase, as is the case with the government subsidy program and to a lesser degree some large farmer organizations and plantations. This implies that perhaps the government Fertilizer Subsidy Program (FSP) has created some level of codependency for the supply of fertilizer to the Haitian market.

Since the late 1980s, the Haitian fertilizer market was dominated mainly by the donations of the Japanese Kennedy Round II (KR II) program. The acquisition and importation of fertilizer were undertaken by the GoH, along with distribution that utilized government rural structures and farmers' associations. There was some room for private sector importation, especially for that section of the market not intended to be the beneficiary of the FSP. After the earthquake, given the immediate need to reactivate the agriculture sector by supporting small farmers in attempts to increase food production, the government took full control of the importation and distribution of fertilizer. During this time, distributed fertilizer was highly subsidized – in excess of 80 percent of the market price or at no cost in some cases – in order to allow the recapitalization of the farmers after the earthquake. Under these circumstances, it was difficult for the private sector to compete in a market that offered deeply discounted or free fertilizer. It was expected that the 80 percent subsidy would be gradually phased out; however, the government still has no stated policy or plan for subsidy implementation or exit and to date has used an ad hoc approach in FSP implementation.

The Haitian fertilizer market needs and consumption are relatively small. Most of the mineral fertilizer consumed in Haiti is imported with a supply choice location depending on the buyer and the source of funding. Originally, most imports were from Japan, Europe and the Baltic,

as a precondition of the KRII program, which has been the main source of subsidy finance. However, given the short distances and lower prices offered, most fertilizer is currently imported from the DR and Trinidad and Tobago in addition to some imports from Venezuela in the form of donation. Some DR companies have established subsidiaries in-country to supply the market and to participate in the government and donor calls to tender under the FSP.

Fertilizer imports and consumption have been erratic, with ups and downs during the last 15 years, attributed to the GoH’s inconsistent intervention in the market through the subsidy program. The amount of fertilizer imported in Haiti since the official introduction of the FSP in 1997 has fluctuated between 24,000 mtpy in 1997 to over 45,000 mtpy in 2010. There was a low of 7,000 mtpy in 2004 when the government withdrew from the market by suspending the subsidy program due to fiscal constraints. During most of these times of government withdrawal from the market, private importers tried to react and fill the void left by the government, only to find themselves facing government intervention again unexpectedly. This erratic behavior was more noticeable during the periods of 1997 through 2004 and then again between 2007 and 2011 (Figure 1).



Source: Various; Bellande and Damais, 2004; Seed Security Assessment 2010; and WINNER program.

Figure 1. Total Fertilizer Imports and Consumption in Haiti, 1997-2011

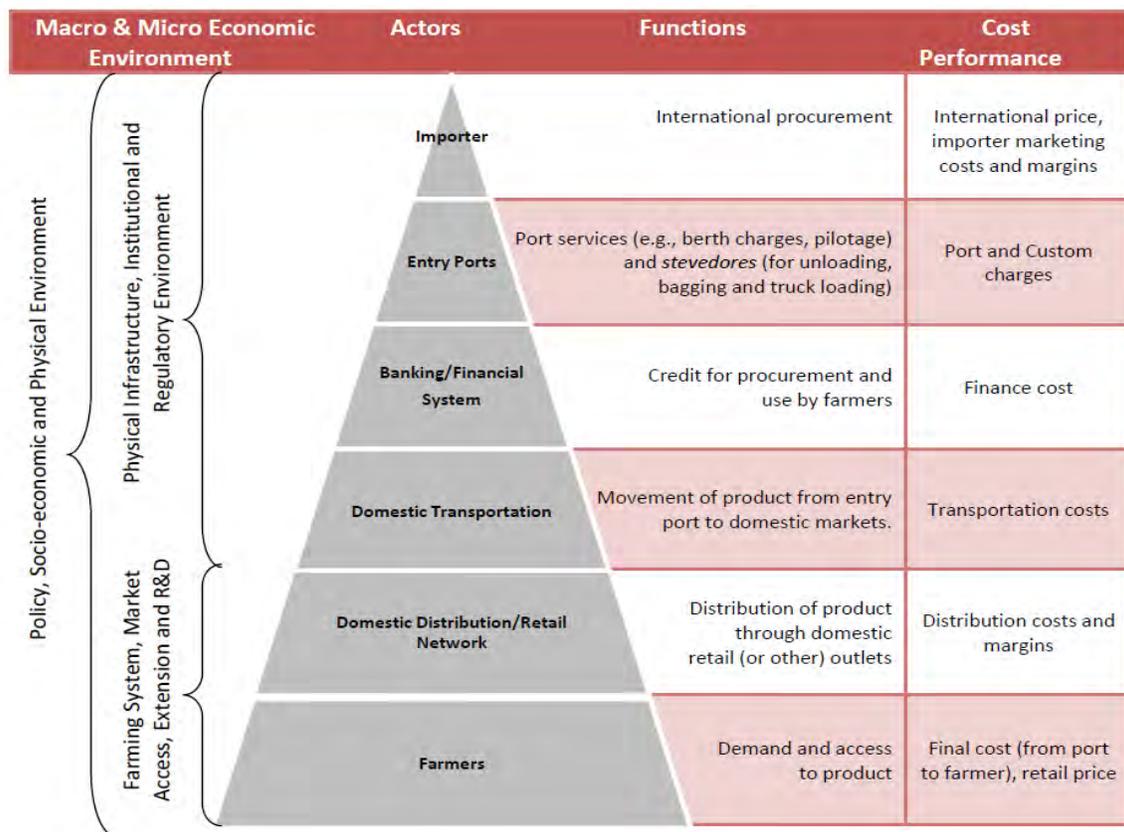
Between 2005 and 2007, the amount of fertilizer imported seemed to stabilize at around 15,000 mtpy when private companies were the primary importers and distributors of fertilizer in-country coinciding with the temporary government withdrawal from the market. In 2008, the levels of imports and consumption increased suddenly to a level higher than 1997 levels and continued increasing, reaching the highest historical peak in 2010 to then drop suddenly in 2011 to levels similar to the 2005-07 period, once again due to the government suspension of the subsidy (Figure 1). The sudden increase in imports and consumption in 2008 coincided with the reinstatement of the subsidy on fertilizer as a result of the political turmoil facing the country by late 2007. The continued increase is related to the revamping of the subsidy as a result of the 2007-08 food and oil crisis and the subsequent natural catastrophes that batter the country, including the January 2010 earthquake. Currently, it is expected that fertilizer consumption will continue increasing in light of changes in government policies to incentivize the supply and use of fertilizer in Haiti.

At its peak, the maximum amount of fertilizer consumed in Haiti for the main two production seasons and a short season called ‘canicula’ is about 45,000 mtpy, with a maximum potential, according to industry experts and under the government FSP, that could be as high as 70,000 to 80,000 mtpy, or nearly double the maximum amount reached in the best years. Furthermore, some recent reports show estimations of 150,000 to 180,000 mtpy, which are arguably overly inflated, presumably as an attempt to justify GoH investment in a fertilizer blending plant with donations from the Government of Taiwan. The industry believes that if this amount is to be reached, it will take between 10 and 20 years, provided the implementation of the right government policies that incentivize demand and supply and the implementation of a subsidy program in a market-friendly way. Therefore, this growth is contingent on: the implementation of the right policies for investment in productive and market access infrastructure; provision of farm services to make better use of inputs by farmers; the implementation of programs to make inputs affordable to the small-scale and subsistence farmers; and the level of crop prices on the demand-side. This is in addition to investment in measures to reduce the cost of supplying fertilizer and to incentivize market expansion near the farmers where it is most needed, on the supply-side.

Therefore, in light of the instability due to inconsistent government intervention in the fertilizer market, the private sector is normally reluctant to bring more fertilizer in-country than what is demanded in the open market. Similarly, the argument can be made that private importers have become dependent on the government subsidy program, which presumably finances private sector importation under contractual obligations. The private sector is therefore unwilling to take any risk outside of the FSP, importing only what they are able to finance on their own and realistically sell in the open market.

1. *The Fertilizer Supply Chain Structure*

Figure 2 provides a schematic view of the domestic fertilizer supply chain structure as found in Haiti and highlights the role of the various actors along the chain; it also includes policy, socioeconomic and physical environments that can influence their evolution.



Source: IFDC.

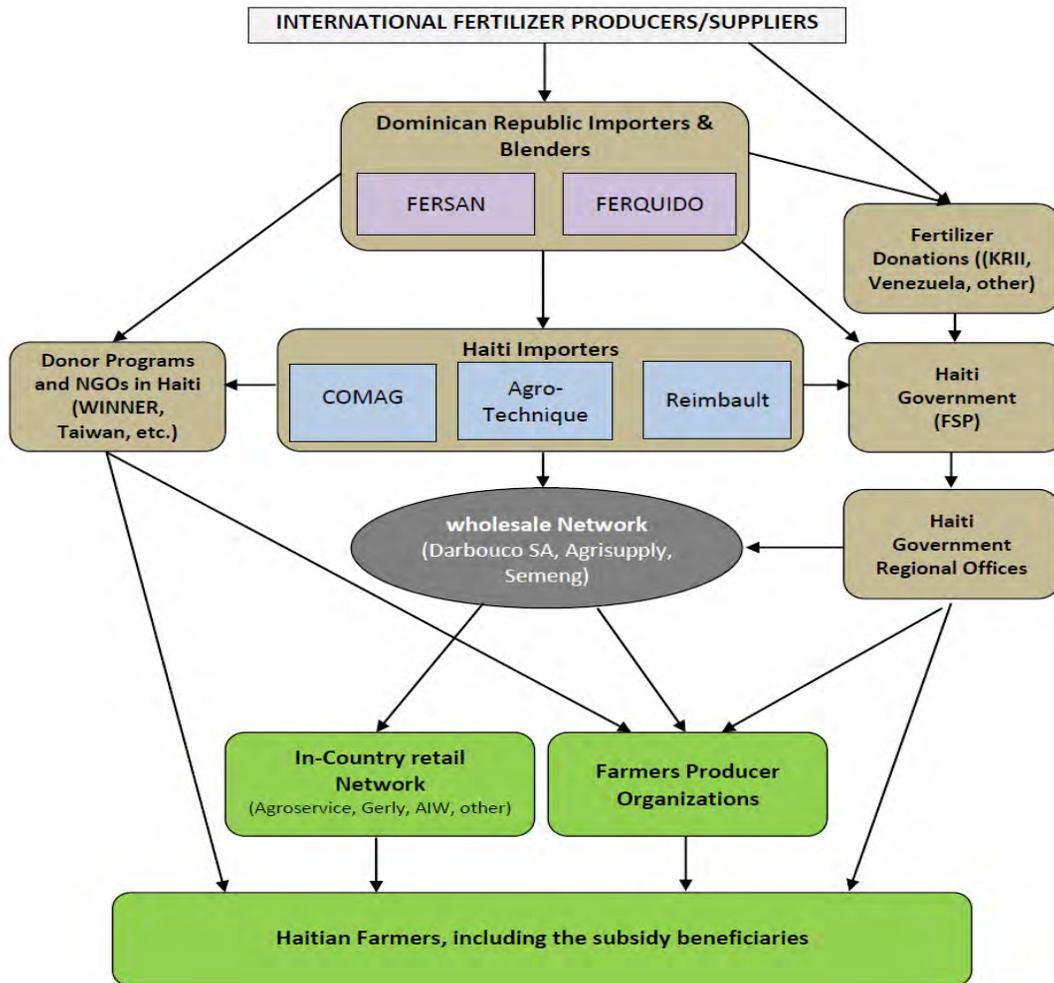
Figure 2. Haiti Fertilizer Market Players, Functions and Cost Performance Indicators

Costs that arise from the different stages along the domestic fertilizer supply chain, according to Figure 2, contribute to the final price paid by farmers. The final cost is affected by limited access to finance and high interest rates in the domestic banking system; poor infrastructure and market coordination inefficiencies; poor rural road conditions; weak and underdeveloped retail marketing networks; and a weak institutional and regulatory environment. Improving these factors will positively affect the functioning of the fertilizer supply chain in Haiti and reduce transaction costs while improving its efficiency. Consequently, the need for subsidies could be reduced. Additionally, if a subsidy is still required, the improved efficiency along the supply chain would lower the ultimate cost of the subsidy program, therefore reducing its fiscal burden on public resources.

2. The Fertilizer Distribution Chain in Haiti

The main players in the fertilizer market can be categorized as private importers/wholesalers, wholesalers/retailers, NGOs, farmers' organizations and the GoH through the subsidy program. Farmers are the final recipients of the fertilizer product, whether through the open market or under the FSP. The players involved in the supply and use of fertilizer are described below and illustrated in Figure 3.

There are a small number of private companies that occasionally import fertilizer for sale in Haiti. The three major companies involved in importation are: COMAG, Agrotechnique and Reimbault. Some of them are characterized by having their own storage infrastructure and distribution networks down to the farmer. Smaller companies include Darbouco S.A., Agrisupply and Semeng are primarily involved in domestic distribution, although they have the capacity to import. All of these companies have supported the government by importing fertilizer for the subsidy program and also engaging in their own importation to serve the market that is not served by the government FSP. They import most of the fertilizer from the DR producers of blended products (FERSAN and FERQUIDO).



Source: IFDC.

Figure 3. General Fertilizer Distribution and Marketing Structure in Haiti

During the times of government interference in the market with the subsidy program, these companies temporarily stopped importation, leaving the government as the primary importer. However, they continued the distribution operations, buying fertilizer directly from MANRRD for distribution in their respective regions of influence around the country. They have flourished, especially during the time of no government interference in the market.

3. Donors and Non-Governmental Organizations

In addition to government and private sector imports and distribution, several donor-funded programs and NGOs have imported fertilizer directly or through the main domestic importers in order to supply and distribute it among farmers and farmer organizations under their

respective projects. This is in support of their agricultural production programs and as part of a technological package in their respective areas of influence.

In the past, NGOs such as Société Coopérative pour le Développement International (SOCODEVI), the Association Haïtienne pour la Maîtrise des Eaux et des Sols (ASSODLO) and Fédération Luthérienne Mondiale (FLM) have imported fertilizer with authorization from MANRRD. More recently, other organizations such as the Earth Institute, Oxfam, WINNER program, the Taiwan Rice Project and the Food and Agriculture Organization (FAO) of the United Nations were also involved in the importation of fertilizer to be distributed as part of a technological package offered to assisted farmers. Most of this fertilizer has been offered for free or heavily discounted (up to 80 percent of its cost) as a way to subsidize beneficiary small farmers' crop production.

The WINNER program has been importing fertilizers (mainly urea and/or 15-15-15), which was originally granted to 39 farmers' association retail stores (now down to about 24) being supported by the program in Gonaïves, Plateau Central, Arcahaïe, Kenscoff and Plaine du Cul-de-Sac. The product is offered to the stores at a subsidized price that started at 80 percent of its importation cost, with a gradual reduction of the subsidy down to zero in a period of three to five years. The intention of this support is to capitalize farmers' organization agro-input stores, especially those stricken by the 2010 earthquake. These stores are required to sell the fertilizer to individual farmers at the price set by the government under the subsidy program. The amount purchased by the program depends on the number of hectares that the project intends to cover in its areas of intervention. The original objective was to cover 10,000 ha. The number of hectares is expected to increase over the following years during the life of the program. The project contracts the fertilizer purchases through the two main local importers from the DR.

FAO imported fertilizer in response to the government request to take advantage of a donation from the International Fund for Agricultural Development (IFAD) in support of small subsistence farmers. This fertilizer was distributed at no cost as part of a technology package that included seeds, fertilizer, basic production tools and technical assistance in the form of demonstration plots and training. In addition, FAO (under its emergency relief program) has

distributed about 32 mt of fertilizer each harvest season since 2008 to groups of farmers involved in seed production in selected areas in the country.

The Taiwan project makes available about 18 mt of fertilizer to farmers they support. The amount of fertilizer purchased is based on the number of hectares the project plans to cover. The purchase was expected to increase by about 18 mt each year, at least over the following three years. The project may purchase fertilizer from the government subsidy program, but because of the type of fertilizer formulation recommended (20-5-20-4S) under the program, the stock is purchased directly from DR importers.

It is believed that these interventions do not have direct or immediate interference with normal market conduct and performance since the product is not sold directly in the open market. Instead, it is supplied in the form of a grant to farmers' associations and retail stores supported by the respective project or institution. However, the reality is that this donor situation has unintentionally come to displace commercial fertilizer over time, further distorting the market and interfering with the proper development of an open market, while discouraging private importers to invest in the expansion of the market closer to farmers.

4. Local Distributors and Retailers

The local distributors and retailers are private agro-dealers (i.e., Agroservice, Gerly and AIW, among others) with a specific regional presence or operations nationwide and/or are farmers' associations that acquired fertilizer for sale from private importers, the government and donor's programs. They are typically located in the major urban areas and larger towns, especially in the regions of major fertilizer use like the Artibonite and Kenscoff regions. Otherwise, they can be at a considerable distance from rural farmers. Farmers' associations normally cater to affiliated farmers and are typically more involved in the distribution and retail of the subsidized fertilizer following donor and MANRRD guidelines for setting the price and distribution. In addition, many of these distributors sell fertilizer in bags to small retailers who in turn retail the product in open air or roadside markets. According to predominant farmer needs, the roadside retailers offer fertilizer in units of 45-kg bags or in smaller quantities such as a 'mamit,' which is a unit of measure usually involving a can of between two and four quarts, equivalent to about 2.3 kg (5.5 lbs) of fertilizer. The farmers' fertilizer demand is in direct

relation to their plot size and the variety of crops planted on their small plots and requires the sale of fertilizer in smaller units from open 45-kg bags.

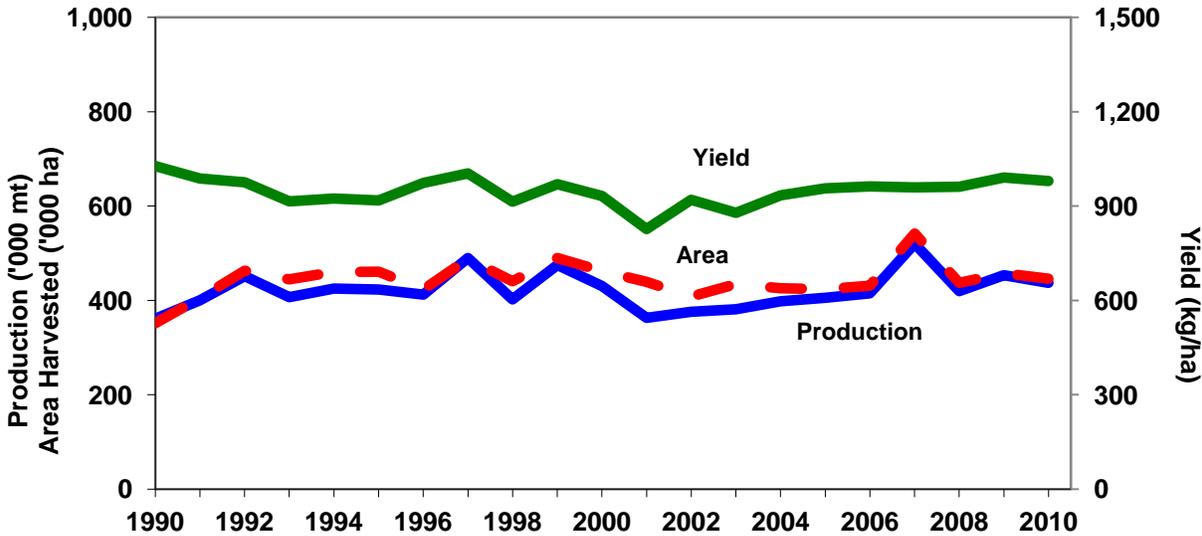
5. Government Importation and Distribution: The Fertilizer Subsidy Program

Fertilizer subsidies are not new to Haiti; they can be traced back to 1983 when the Japanese KRII Program started supporting Haitian farmers by providing fertilizer at a discounted price. However, prior to 1997, agriculture in Haiti suffered from low yields and production, which had been declining over the years. In an effort to stop and reverse such declines, the GoH officially introduced a subsidy on fertilizer in 1997 to make it more accessible to all farmers. The initiative was intended to simultaneously address economic and social concerns: to facilitate access to fertilizer and as an income transfer to farmers. The general objectives of the program were to improve farmers' living standards and to reduce the importation of agricultural products in Haiti (MANRRD, 2011). Consequently, for many years, the importation and distribution of fertilizer were on the hands of the GoH under the MAARNDR's FSP. The expected beneficiaries were farmer members of producer organizations identified by the government and private distributors.

The official subsidy entered into effect after the GoH signed a formal agreement with the Japanese government to subsidize fertilizer for 10 years with their KRII donations. Under this agreement, the Government of Japan offered an annual donation of approximately US \$6 million per year for the purchase of fertilizer in the international market. The Japanese donation was eventually complemented with GoH fiscal funds and donations from the Venezuelan Government. For the 2009-10 planting seasons, the GoH intended to subsidize fertilizer at a cost of 2.45 billion gourds (US \$61,250,000), for which the government allocated 25 million gourds (US \$625,000), with the difference expected to be funded with foreign donations, including the already existing KRII program (Ministere de la Planification et de la Cooperation Externe, 2009).

The expected result of the subsidy program was to increase agricultural production in the order of 55 percent on cereals and 50 percent for legumes and tubers. However, despite the subsidy on fertilizer, agricultural production did not increased substantially. In fact, cereal yields have declined consistently from 1,026 kg/ha in 1990 to 976 kg/ha in 2010. Within the same

period of time, total cereal production seems to present a similar erratic pattern as fertilizer import and consumption, reaching the maximum level in 2007 to then drop again to below the early 1990s level by 2010 despite the apparent increases in fertilizer consumption during 2008-2010 (Figures 1 and 4). These levels of yield and production are neither sufficient to meet the increasing domestic demand of a growing population nor to support export demand, resulting in the increasing importation of food products while generating an ever-larger trade deficit.



Source: FAOSTAT 2011.

Figure 4. Haiti Cereal Production, Area Harvested and Yield, 1990-2010

Since the introduction of the fertilizer subsidy program in 1997, there have been surges in fertilizer consumption and slight increases in agricultural production in spite of yield reduction. These increases in production have been attributed to the FSP, and are the reason why the GoH revamped the FSP with additional fiscal funds, at least in the short term. However, due to the ad hoc approach of the GoH in the implementation of the subsidy program and the lack of a clear policy and strategy, there are doubts about whether any increase in overall production can in fact be attributed to the subsidy program and/or associated with an increase in fertilizer consumption. The slight increase in production despite yield reduction, suggests that perhaps fertilizer formulations were not adequate and were not used optimally and that the increase in production can be attributed to an additional intensification by commercial farmers and to the expansion of

the planted areas (reclaiming idle land and, to a lesser extent, the claiming of new land) by commercial and non-commercial farmers (Figure 4).

GoH fertilizer procurements and distribution under the FSP were required to adhere to the rules and conditions of the donors. Under the KRII program, the Government of Japan hired Japanese consulting companies to manage the donation and to issue calls to tender for the supply of fertilizer to Haiti. According to this program, the fertilizer would not be offered to farmers in the form of a grant or for free, but instead would be offered at a discounted price (subsidy) of 70-80 percent below the market price, with a gradual reduction of the subsidy (or discount) down to zero (no subsidy) during the 10-year period. Venezuela has been directly supplying fertilizer product in the form of donations. Importation made with GoH's own fiscal funds was contracted with local private importers. Agribusinesses and other organizations and institutions interested in the distribution of fertilizer acquired the product from the MANRRD at subsidized prices, expected to be transferred to farmers. By 2003, this approach changed; potential buyers such as the Organization for the Development of the Artibonite Valley (ODAV) and the Direction Departementale Agricole (DDAs) of MANRRD were accredited by GoH regional offices for distribution of the subsidized fertilizer.

Following an FAO recommendation based on an assessment of the government fertilizer subsidy program, MANRRD withdrew from the market in 2004, just as the Japanese KRII program also suspended its donations in an attempt to liberalize the fertilizer market. Private companies began importing and distributing fertilizer on a competitive basis in an effort to fill the void left by the government. However, fertilizer supply dropped substantially and prices increased in a proportion larger than the increase in the international market. It is estimated that between 2003 and 2008, the price of fertilizer in the domestic market increased from US \$200/mt to US \$1,200/mt – in part due to speculations in the domestic market, a situation that was exacerbated by the oil and food crisis of 2007-08 – making it less accessible to small and subsistence farmers. The consequence of this increase was that agricultural production continued to fall, contributing to the aggravation of the already vulnerable food supply and soaring food prices in Haiti, causing riots that arguably toppled the government.

In an effort to ease the soaring food prices, the succeeding government was compelled to reintroduce the subsidy program, this time under the newly created FSP office and with the additional temporary support of the Government of Venezuela with donations of about 15,000 mt of urea in 2008 and 27,000 mt in 2009. Although the idea of the donations was to distribute fertilizer at low prices, the GoH used them to reintroduce the subsidy by distributing this fertilizer for free. By 2009, the Japanese government reinstated the US \$6 million grant under the ‘Les Dons Hors Project’ (non-project donations) for the importation of fertilizer; in addition, the GoH made use of its own public funds to revamp the program. Therefore, by 2010, the FSP had three sources of funding: the Japanese donation, in-kind donation from the Government of Venezuela and budget allocation from the GoH equivalent to US \$10 million.

Government officials wanted to continue with the free distribution of fertilizer, but MANRRD managers set a low price equivalent to a subsidy of more than 75 percent of the FOB price. Contrary to the original rules of the KRII program, under the new donation there was no restriction on the origin or acquisition of the fertilizer products. Currently, the MANRRD contracts and purchases the stock of fertilizers through domestic importers. The latest tenders were acquired from the DR.

Under the FSP, each Agricultural Departmental Directorate requests an amount of fertilizer according to its estimated needs, to be distributed locally in their region of influence. However, it is the FSP program manager in Port-au-Prince who decides the allocations to each region, presumably using as a criterion the region’s importance according to historical production and fertilizer use. Authorization to purchase at the MANRRD central office is supposed to be given by the DDA, but some are able to subvert that process using their political connections to purchase their stock at the regional warehouses. At the departmental level, the purchase can be made at the Bureau Agricole Communal (BAC) or directly at the DDA facilities.

A New FSP Strategy – After the reintroduction of the fertilizer subsidy in 2009 in response to the oil and food crisis, and the devastating earthquake in January 2010, , the demand for fertilizer once again increased substantially, so much so that the government no longer had the capacity to meet the increasing demand. In light of this shortcoming, the GoH envisioned a

new implementation modality under which it would allow more participation of the private sector in the importation and distribution of fertilizer. Under this modality, the government provides a subsidy to importers equivalent to 33 percent of the importation cost delivered at Port-au-Prince, upon presentation of import documentation. This subsidy is to be gradually reduced until its elimination in a non-specified period of time and expected to be transferred in full to the farmers in the form of a price reduction at the retail level.

Under this new modality, importers are to supply fertilizer directly to producers' organizations and coops without direct government involvement, at prices validated by the structures of control (MARNDR) up to a quantity necessary to satisfy local demand in the different production zones around the country. Other roles of the MARNDR under the new strategy are to supervise all subsidy operations to make sure they accomplish their objectives, and provide quality and price control to avoid rent seeking opportunities and excessive charges for the subsidized product to farmers.

However, private importers have not been willing to risk their own funds – or perhaps did not have the funds, neither did they have access to finance to import the amounts required by the market aside from the subsidy program. Importers mainly bring in some of the quantities contracted by the GoH under the FSP. Although there are large private farming operations, most of them supply their own needs by importing directly from the DR. Consequently, there is no incentive for the importing companies to bring additional quantities outside the FSP contracts, mainly because:

1. Under the GoH FSP contracts, importers can waive the five percent minimum charges applicable to all products entering the country; therefore,
2. The open market imports outside the FSP contracted quantities would not be competitive with the subsidized product.

In addition, there are arguments that government's FSP support has resulted in displacement of commercial fertilizer and that delay in government payments to importers has further discouraged them to participate in the open market or to even bring in the quantities contracted by the FSP. As a result, the country has suffered from periodic shortages of fertilizer

and prices increased until the government was compelled to provide financing to the private sector for importation.

Furthermore, the new strategy seek to: (a) establish a stock of fertilizer in country to stabilize cost and in order to answer to unexpected emergencies; (b) eventually establish a blending plant for added value to the fertilizer consumed in country; (c) implement measures to avoid the export of subsidized fertilizer; and (d) look at the possibility of developing alternative organic sources of fertilizer. At the same time, the strategy is to eventually subsidize the demand making use of discount vouchers, which will replace the subsidy to importation, to allow a desired targeting to a determined farming population and to contribute to the development of the private sector distribution.

In an effort to improve the management of the FSP new strategy and the delivery of the subsidized product, recently, MANRRD signed a memorandum of understanding (MOU) with the fertilizer suppliers to facilitate farmers' access to fertilizer and regulate the market. The relevant points of the MOU are:

- Importers commit themselves to comply with all requirements established by existing Haitian laws and MANRRD.
- Importers would only import and redistribute fertilizer to local markets. They will use the list of accredited associations for redistribution purposes. Any accredited association or merchant that orders 400 bags or more shall be considered a wholesaler and must abide by the prices provided by MANRRD.
- Under special circumstances, MANRRD will obtain the necessary franchise from the Ministry of Economy and Finance for importing fertilizer.
- In order to effectively monitor the importation of fertilizers, MANRRD will not only establish a group dedicated to oversight but will also reserve the right to make unannounced visits to the sites where fertilizers are imported to observe and report.

There are different points of view on more efficient ways of handling the FSP. Some believe in the combined role of government and the private sector in fertilizer acquisition and distribution under the FSP. Others believe that the government's role in the market should be

constrained to regulations and issuing policies that allow private sector development and consumer protection, and that the role of the private sector should be importation and distribution. However, it is also argued that given the inability of the private sector to supply the quantity needed in the market at the right price, time and place, it is necessary for government intervention. The counter argument is that such inability of private importers and distributors is due to the government's interference in the supply-side of the market. They believe that such interference has not allowed the private sector to develop an effective and efficient acquisition and distribution system. This is in part due to the neglect of macro- and micro-economic policies and an underinvestment in infrastructure that would allow for the more efficient operation of private market players.

Regardless of the different arguments, there is widespread belief that fertilizer subsidies are essential for food security in Haiti since the amount of fertilizer consumed at the farm level is low and appears to be highly dependent upon price. The inability of Haitian farmers to afford inputs is directly related to the low prices received for farmer outputs due to lack of domestic market access. However, government intervention through imports and distribution of fertilizer is not sustainable over time because of its dependence on foreign aid and fiscal constraints. In addition the government faces technical constraints to implement a well-managed program, which has been implemented in an ad hoc manner.

MANRRD officials are concerned about how they will pay for subsidies in the future when aid funds are no longer available. There are also concerns that a decrease in subsidies will likely decrease fertilizer use. As a consequence, a decrease in agricultural production is anticipated unless it is countered by increases in agricultural output prices and/or profit.

6. *Farmers*

Most farmers who are at the end of the fertilizer distribution chain are subsistence farmers and the intended beneficiaries of the government subsidy on fertilizer. According to some estimates, there are about 800,000 smallholder farms in Haiti that have holdings averaging 1.80 ha and operate under various land tenure arrangements (MANRRD and IDB, 2005). Farmers that typically make use of fertilizer and other inputs farm in areas with ample precipitation or benefit from the availability of irrigation. These farmers may use limited

amounts of fertilizer given the low or non-availability in the market, their lack of finance and limited technical knowledge on how to use fertilizer. In most cases, farmers also make low use of fertilizer or use none whatsoever, even if available, as a risk aversion behavior due to the high cost of the product and the low profitability of the investment. These factors are exacerbated by a lack of access to credit by farmers, mainly small farmers, and low access to local markets to sell their excess production.

C. Types of Fertilizers Available in the Haitian Market

The fertilizers most commonly available in the Haitian market are urea, which represents about 60 percent of the market and is mostly used in rice production, and nitrogen-phosphorus-potassium (N-P₂O₅-K₂O) blended formulations, mainly 20-20-10 and 12-12-20. Other formulations sometimes available include 16-10-20, 12-24-24 and 18-46-0. In the past, the GoH also provided 16-16-16 as a replacement for 15-15-15. The choice of formulations is often influenced by donor preference according to prices and availability in the international market. For example, the Japanese KRRI program and Venezuelan donations required that the fertilizer be bought in Japan and Venezuela, respectively, a situation that restricted the type of fertilizer available in those markets. Some NGOs, donor programs and other organizations have also imported fertilizer formulations they consider appropriate for crops in their areas of influence. For example, the Taiwan Rice Project, based on fertilizer response research, has reported sulfur (S) deficiency in their area of influence; therefore, they have been importing their own fertilizer formulation fortified with S (20-5-20-4S) from the DR. The agricultural supply company Darbouco has imported 20-20-20 foliar spray for use on vegetables and ornamental nurseries.

Some specialists have raised the issue of a lack of choices of fertilizer available in Haiti and the difficulty to find the most appropriate fertilizer for particular crops or soil conditions. For example, in some areas of the Plaine des Cayes where there are reports of K deficiency, it is extremely difficult to find a fertilizer formulation in the Haitian market with a higher proportion of K than the available 12-12-20. Another issue related to fertilizer type is the soil pH. In some areas of the Artibonite where soils are alkaline, as a replacement for urea there is a preference for ammonium sulfate (AS), which is also used to complement the amount of N in the formulations available in the market but normally, it is not readily available. Furthermore, other than urea or

AS, single element fertilizer (e.g., KCl) is generally not available, making it difficult to adjust the NPK existing formulation to meet the deficiencies based on soil testing and planted crops.

The importation of only a few types of fertilizer formulations is the result of Haiti's dependence on the DR market; based on this heavy dependence, it is considered to be a segment of the DR market. These formulations, presumably, have been developed for DR conditions, which vary from Haitian conditions, especially with respect to soils. Therefore, these fertilizers do not account for regional differences in nutrient deficiencies in Haiti.

D. Areas of Fertilizer Distribution and Allocations

The amount of fertilizer distributed in the different agricultural areas around the country depends on the region's political and agro-ecological importance (especially under the FSP), the type of importer and the presence of an NGO in a given region. The GoH, to some extent, controls where fertilizer is made available through the FSP. A high percentage of the fertilizer (45 percent) is distributed in the Artibonite region. The priority of this region is partly political, given the presence of one of the largest agricultural associations (ODAV) in the region and given the availability of irrigation to produce mainly rice, maize and vegetables. Other staple commercial and food crops like plantain bananas, cassava and yams are also grown in this region. The region of second greatest importance is Kenscoff, where about 15 percent of total fertilizer in-country is consumed. The importance of this region is its agro-ecological conditions for the production of vegetables and its proximity to supply the main Haitian metropolitan area of Port-au-Prince.

Table 6 presents the distribution of fertilizer according to agricultural department. The priority for fertilizer distribution is for irrigated areas, followed by humid areas, to the exclusion of rainfed agriculture. The exception is high elevation humid zones where there is a predominance of vegetable production. Consequently, estimates of the quantities of fertilizer requirements are based mainly on available irrigated areas and areas with a potential for irrigation and high precipitation. Rainfed agriculture and sloping land are normally neglected in spite of some research that showed strong fertilizer responses in three rainfed sites, two of which were on slopes of 20-30 degrees (Bossa et al., 2005). Grande-Anse is considered an area where a

great deal of organic agricultural production takes place and where little fertilizer is used. Nord-Est and Nord-Ouest also received negligible amounts of fertilizer.

Table 6. Distribution of Fertilizer by Agricultural Region in Haiti

Agricultural Department	Percentage of Fertilizer Use	Main Crops Grown	Region Localities
Artibonite	45%	Rice, plantain, maize, vegetables, roots	Artibonite Valley
Ouest	25%	Vegetables and Plantain	Kenscoff, Pine Forest, Furcy, Arcahaie, Cul-de-Sac plain
Sud	20%	Rice, beans, maize, vegetables	Les Cayes Plains, Saint Louis du Sud
Sud-Est	8%	Coffee and vegetables	Thiotte, Cap Rouge
Nippes	5%	Vegetable and rice	Rochelois Plateau, Abraham, Abse-a-Veau
Plateau Central	4%	Coffee and vegetables	Baptiste, Belladere, Mirebalais
Nord	4%	Rice and vegetable	Saint-Raphael, Grison Garde, Camp Luoise
Other (Nord-Est, Nord-Ouest, Grande-Anse)	10%	Rice, vegetable, beans and coffee	Maribaroux, Saint Louis, Anse-a-Foleur, Beamont, Gonaives, Ennery, others.

Source: Seed Security Assessment, 2010.

It appears that rice is the main crop being fertilized, given its abundant production throughout the country, especially in the Artibonite region. This region receives the greatest amount of fertilizer consumed in Haiti (up to 60 percent according to assessment interviews where the main crop grown is rice). Rice is also produced in more than 10 other locations where MANRRD also distributes fertilizer through its local agencies. Rice production covers more than 50,000 ha throughout the country (Bayard, 2007).

Shortages of fertilizer are a common problem in most agricultural areas. Shortages are the result of government inconsistency of timing and imported quantities and insufficient allocations to the departments. As a case in point, the amount of fertilizer allocated to the Sud Department by the MANRRD central office is typically inadequate to meet the region's demand. The inconsistency in fertilizer supply leads to speculation, further exacerbating shortages.

Government imports can take two to four months or more before the product is made available to farmers. When the purchases are made, especially with donors' funds (e.g., KRII

program), the government must request approval before it issues calls to tender and goes through the process of bidder selection, disbursement and payment in order to acquire the product; this process often may take up to four months. On the other hand, when the private sector imports fertilizer from the DR, it takes a month or less to make it available to farmers. However, in terms of price, it is normally out of the farmers' reach, a situation that motivates the government to continuously interfere in the market, disrupting normal market performance and conduct.

Fertilizer shortages in the Haitian market can be attributed in part to illegal leakage of fertilizer across the border to be sold back in the DR, where the product typically originates. Exchanges of many commodities and inputs take place at the border between Haitians and Dominicans. According to Bayard (2007) observations, even when fertilizer was sold under competitive market conditions in Haiti, farmers in the northeast region near the border purchased fertilizer in cash or credit in the DR. However, more recently, with a lower price for fertilizer in Haiti due to the subsidy program, Haitian wholesalers and some retailers have an incentive to sell fertilizer in the DR, even if illegal. The flow of fertilizer that enters the DR is not known, but some estimates indicate that about 10 percent of the fertilizer stock available in Haiti goes back illegally to the DR to be sold at higher prices. Although this figure is difficult to corroborate, what is clear is that conditions exist that would allow, or at least facilitate, such exchanges. Among these conditions are:

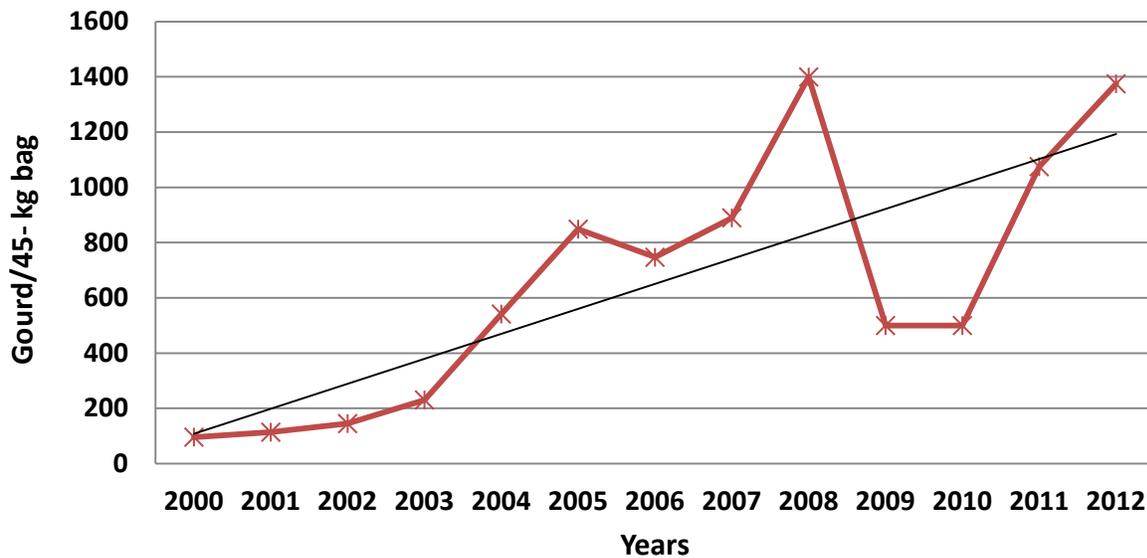
- A price differential between the two countries, a result of an ill-managed blanket (or non-targeted) fertilizer subsidy program, which creates the conditions for a potentially larger profit across the border in the DR, where fertilizer is sold in a more competitive open market.
- Delays in acquisition, delivery and distribution of the fertilizer under the government FSP. When fertilizer arrives late into the cropping season, it does not make sense to apply it to the crops, from the agronomic and economic perspectives; consequently, on-farm use is reduced. Therefore, given the lack of suitable storage and to minimize physical and financial losses by keeping fertilizer until the next cropping season, merchants, especially those near the DR border region, are compelled to sell their stocks at a more favorable price in the DR.
- The misallocation of fertilizer by the government FSP, especially to the border regions with limited consumption. In some border regions the allocation is higher than what is consumed. This, in addition to delays in delivery, creates the conditions for fertilizer to find its way back

across the border. Again, this is an effort for agribusinesses to reduce physical and financial losses and, in addition, increase profits.

E. Prices of Inorganic Fertilizer in Haiti

Accessibility to fertilizer in terms of price in addition to availability has always been a major issue for the Haitian fertilizer market, especially in remote rural areas, in spite of the subsidy. In fact, high fertilizer prices have been the major justification for the direct government involvement in the market through the subsidy program with set maximum market prices. Over the years, the Haitian government has alternated between importing fertilizer and subsidizing its prices and leaving prices to fluctuate with the market by withdrawing from it.

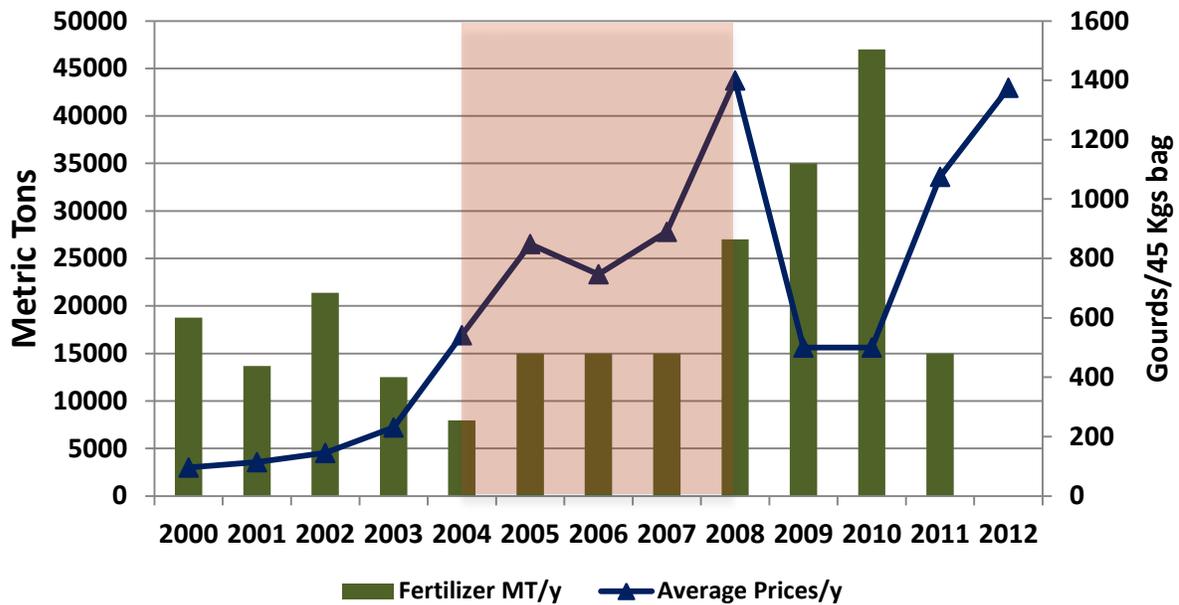
Two approaches have determined the prices of fertilizer in Haiti: free market conditions, where supply and demand forces define prices and guide decision-making; and government price-setting and control under the FSP. Until the end of 2003, fertilizer prices were relatively low, varying between 107 and 265 Gourdes (US \$2.54-\$6.30) per 45-kg bag of urea and between 95 and 280 Gourdes (US \$2.26-\$6.66) for NPK formulations. These prices were set by MANRRD in an effort to make fertilizer more affordable to farmers. At the end of 2003, the government fertilizer subsidy represented more than 40 percent of the actual costs, with price differentials based on the type of fertilizer and the region. This allowed reasonable marketing margins to distributors and compensated for the cost of transportation to the respective regions. Therefore, farmers paid slightly different prices depending on their locations. The evolution of fertilizer prices is presented in Figure 5.



Source: Various; Bellande and Damais, 2004; Seed Security Assessment 2010; and USAID/WINNER program.

Figure 5. Average Fertilizer Prices, 2000-2012

From 2004 to 2008, prices skyrocketed, varying from between 800 to 1,278 Gourdes (US \$19.02-\$30.38) per 45-kg bag of urea and between 735 to 1,290 Gourdes (US \$17.47-\$30.67) for NPK formulations, when importation and distribution were carried out by the private sector (Figure 6). Between 2004 and 2008, prices perhaps better reflected the real costs of importing and distributing the products within the country (in the absence of government intervention), with the highest prices coinciding with the oil and food crisis of 2007-08. However, by 2008, price increases for fertilizer outpaced those of crops. Consequently, few farmers were able to afford even small quantities of fertilizer and most stopped buying.



Source: Various; Bellande and Damais, 2004; Seed Security Assessment 2010; and USAID/WINNER program.

Figure 6. Total Fertilizer Imports and Consumption in metric tons and Average Prices/45-kg Bags

By 2010, the price set under the FSP for all types of fertilizer was about 500 Gourdes (US \$11.89) per 45-kg bag throughout the country. The reason for this drop in fertilizer price was the reintroduction of the government subsidy, equivalent to 80 percent of the actual product cost. All distributors and retailers were to adhere to this policy. Therefore, in order to allow for a reasonable marketing margin and for transportation cost, between July 2008 and August 2009, MANRRD sold the product to distributors at a lower price, applying volume discounts. Prices to distributors ranged from 300 Gourdes/45-kg bag (US \$7.13) for larger quantities of 5,000 bags or more, and 375 Gourdes/bag (US \$8.92) for small quantities up to 200 bags, with different prices for quantities between 200 and 5,000 bags.

After 2009, MANRRD started selling fertilizer to intermediaries at a fixed price of 350 Gourdes (US \$8.32) per 45-kg bag regardless of the quantity sold. The price differential between the wholesale and retail price was intended to allow local suppliers to make a reasonable profit per bag and to cover transportation costs. However, there are anecdotal reports that in many instances, fertilizer was being hoarded to artificially create a shortage in the market and allow the price in the market to increase so fertilizer could be resold at a substantial profit for double and

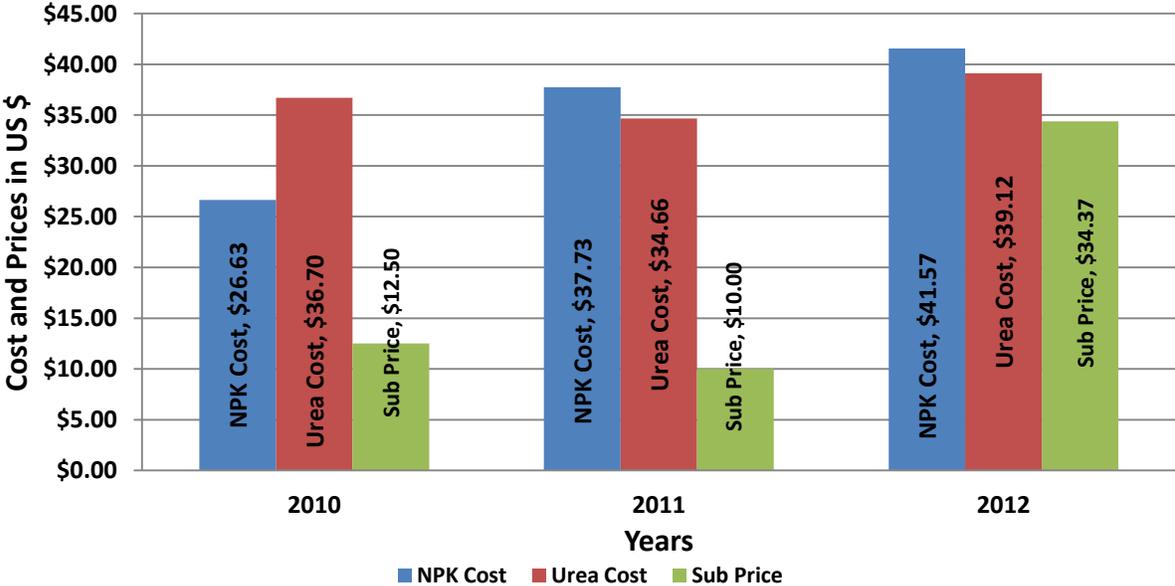
triple the government price. This practice came to subvert the government subsidy and consequently did not meet the expected result of making fertilizer more accessible to farmers in terms of quantity and price.

Table 7 and Figure 7 present the average costs of fertilizer (NPK and urea per 45-kg bags) for the last three years since 2010 and the level of subsidy based on prices set by the government under the FSP after the earthquake. In 2012, the level of subsidy was lower, presumably due to government fiscal constraints.

Table 7. Fertilizer Cost and Average Subsidy in Haiti, 2010-2012

Year	NPK Cost	Percent of Subsidy	Urea Cost	Percent of Subsidy	Subsidized Price	Percent Average Subsidy
2010	\$26.63	53%	\$36.70	66%	\$12.50	60%
2011	\$37.73	73%	\$34.66	71%	\$10.00	72%
2012	\$41.57	17%	\$39.12	12%	\$34.37	15%

Source: Author interviews and USAID/WINNER program.



Source: Author interviews and USAID/WINNER program.

Figure 7. Fertilizer Cost and Subsidized Prices of Fertilizer at Retail Under the FSP

F. Research on Soils and Fertilizer

In Haiti, the lack of funding for agricultural research and extension has been a serious issue for decades. The GoH and donors have not placed a high priority on agricultural research and, consequently, research has declined over the past three decades. Research on crop fertilization is very rare.

Nevertheless, in the past there have been some studies conducted on soil assessments and the use of mineral fertilizer. Some of the earlier research by Guthrie et al. (1990) and Guthrie and Shannon (2004) described and classified soil profiles in several locations around Haiti. Dauphin-Clermont (1998) surveyed farmers in the Kenscoff and Artibonite areas and calculated linear regressions of yield response on the applied quantities of fertilizer based upon historical data. Later, Louissaint and Duvivier (2005 and 2006) assessed chemical properties and soil texture in 50 soils in the Artibonite Valley in order to determine soil fertility status of rice-producing areas. Bossa et al. (2005) conducted P and K fertilizer response trials in maize on calcareous soils, including treatments with leucaena clippings as organic soil amendments, and the Programme d'Intensification Agricole (PIA, 2006) carried out fertilizer trials on rice. A report from the Faculty of Agronomy and Veterinarian Medicine (FAVM) of the University of Haiti indicates that a lack of drainage was a problem in the Cul-de-Sac region, resulting in high soil salinity.

More recently, the Taiwan project has tested rates of fertilizer for rice in the southern region. Although they did not publish their data, they reported K deficiencies in the Plaine des Cayes, which corroborated previous study findings. They also reported significant response to S application; therefore, the fertilizer formulation they provide to farmer beneficiaries is complemented with S (20-5-20-4S).

Although most of this research has provided general information on soil fertility and fertilizer use, the results have not been used to develop congruent and consistent fertilizer recommendations. The main issue of this research is that it has been done sporadically and designed based on specific project needs rather than systematically so that results can be utilized to determine soil characterization and mapping, and to develop specific fertilizer recommendations based on soil and crop needs.

1. *On-Farm Fertilizer Recommendations*

There are no official recommendations on fertilizer use in Haiti. Government and other program agronomists that provide technical assistance to farmers in the field generally make fertilization recommendations based on rates established over time for specific crops. Some of these rates are based on outdated research without taking into consideration soil characteristics and soil fertility of specific fields according to soil tests. Recommendations and use are generally expressed in the number of 45-kg bags/ha, rather than being nutrient-based.

There is documentation that indicates the amount of fertilizer for different crops in selected areas. Bellande and Damais (2004) reported the global amounts of fertilizer used on farms for selected crops in different regions (Table 8), but they do not specify nutrients nor products (e.g., urea and NPK formulations).

Table 8. On-Farm Use of Fertilizer in 2004

Area	Crops	Recommendation (kg/ha)
Artibonite	Irrigated rice	400
Les Cayes	Irrigated maize	300
	Irrigated beans	250
Rochelois Plateau	Cabbage and carrot	450
Furey-Kenscoff	Leek	800
Thiotte	Coffee	250

Source: Various; Bellande and Damais, 2004; Seed Security Assessment 2010.

In addition, there are other recommendations based on expert advice, which varies according to who is giving the recommendation and for what crop and location. Some recommendations are specific and research-based (e.g., Duvivier et al. [2006] who recommends 115 kg N/ha + 27 kg P/ha + 13 kg K/ha to obtain a rice yield of 6.0 mt/ha, based on research conducted in Artibonite). Others are seemingly based on expert advice; e.g., at Salagnac, yam, carrot and cabbage are to be fertilized with 600-800 kg of fertilizer with the addition of manure (chicken litter, rabbit and horse waste). In addition, some recommended rates seem quite high, not economical, and could be contributing to environmental pollution (e.g., eutrophication, ground water contamination). For example, based on the consultation, in the Artibonite region, some technicians recommend 10 to 12 bags of fertilizer, of which four bags are urea, according

to the rice variety being planted. Oxfam recommends about 19 bags of 45 kg of compound mineral fertilizer per hectare of cassava, a crop mainly produced in dry areas. Studies by PIA (2006) suggest that too much N, P and K is being applied on rice in Artibonite. Because of the long history of fertilization in certain rice and vegetable growing areas, it is necessary for P rates to be decreased because of a possible build-up of P in these soils, a cycle that must be broken. However, regardless of the myriad of recommendations, most farmers mainly use urea. Compound fertilizer is typically applied only in alternate seasons.

Furthermore, there is little scientific support to guide fertilizer application at the field level and the existing guidelines are vague. For example, the Taiwan Rice Project recommends four applications of 1/3, 1/3, 16 percent and 16 percent beginning with basal doses of complete fertilizer. Oxfam's recommendation on cassava is to apply mineral fertilizer at planting and 50 days later, while stressing the importance of water for fertilizer use.

G. Alternative Sources of Soil Nutrients and Amendments

Alternative nutrient supplies from organic and biological sources have not been widely utilized in Haiti. Authorities (i.e., the MANRRD) have not encouraged either the production or the use of organic fertilizer. However, some NGOs are actively promoting the use of organic amendments and compost through training and advice to farmers. The WINNER program is providing technical support to farmers in the commercial production, preparation and use of compost, based on refuse from the wholesale vegetable markets. Oxfam recommends the use of 62 bags of 45 kg of compost per hectare of cassava; although the economics and availability of such amounts of compost are questionable. Others suggest 36 bags of compost per hectare of rice. Some organizations are also promoting the use of vermiculture, where worm castings are used to fertilize crops and the worms are fed to chickens.

In some parts of the country, there are attempts to maintain soil fertility by incorporating organic matter (crop residues, market wastes, animal manures) and crop rotation, mainly in the vegetable-producing regions where there are abundant crop residues. Animal manure, primarily from the poultry industry, has been widely used as a source for soil amendments and as an organic source of nutrients, but availability has considerably decreased with the decline in domestic poultry production. These practices are known throughout the country, but are not well-

documented. On the contrary, in other regions, especially where cereal crops are produced, crop residues are sometimes extracted for alternative uses. Furthermore, tree cutting and the resulting soil erosion and overgrazing of the land leave little organic material residues necessary to contribute to soil structure and fertility. Consequently, to compensate for the lack of inherent soil fertility, mineral fertilizers are used in large amounts, especially in areas where water is adequately available (irrigated regions, humid mountains), and where high value crops are produced (e.g., rice and vegetables).

One plant that has a lot of potential as a source of nutrients, especially N, is leucaena (*Leucaena leucocephala*). This N-fixing legume tree has been widely planted in many parts of Haiti as contour hedgerows for soil conservation. Basic research in Haiti has shown leucaena to increase yields in maize (Isaac et al., 2004, 2003) or at least maintain yield without the use of N fertilizer (Shannon et al., 2003). Bossa et al. (2005) reported that net returns were higher when leucaena clippings were applied to maize without fertilizer than with fertilizer. Other research demonstrates that when the clippings from N-fixing legumes are incorporated into the soil or applied as mulch, inorganic fertilizer use can be reduced. They also provide micronutrients. Carlin Prosper of the Taiwan Rice Project reported that leucaena leaves applied to rice decreased fertilizer requirements by 4-6 bags. Although hedgerows are still in use for soil conservation and crop production in Haiti, it is important to consider that the use of leucaena hedgerows as a soil amendment competes with its use as fodder for ruminants. Legume cover crops such as velvet bean compete for space with staple food and commercial crops, and also serve as fodder. Bayard (2007) reported problems with adoption and maintenance of alley cropping in south Haiti.

All of these alternative sources have low concentrations of nutrients compared with chemical fertilizer, and the cost of transporting these materials over long distances can be an economic issue. Also, the volume of compost and manure is likely to be small relative to land areas under cultivation, so these nutrient sources are most likely to be used on high value crops or on crops close to the areas where the organic material is produced or processed. All of these sources could reduce, but not eliminate, the need for inorganic fertilizers.

H. A Summary of Haiti Fertilizer Market Issues and Constraints

In addition to the issues raised by the GoH intervention in the market through the FSP, there are other constraints affecting the conduct and performance of the fertilizer private market. These can be categorized in three broad groups: macro-economic structural constraints, market development constraints and technical constraints with policy implications, as elaborated thereafter.

1. Macro-Economic Structural Constraints

The main macro-economic constraint facing Haiti is poor rural infrastructure, mainly roads and productive infrastructure, most of which were damaged after the 2010 earthquake. Poor roads lead to increased transaction costs, making the delivery of inputs and agricultural products more expensive while poor productive infrastructure restricts agricultural productivity and production. This situation, consequently, reduces input demand and therefore disincentivizes suppliers from reaching the rural areas. Furthermore, lack of or damaged roads, is an obstacle that limits market access, not only for inputs to farmers but more importantly for farmers' outputs, a situation that further discourages the use of productive inputs like fertilizer.

2. Market Development Constraints

Market development constraints relate to the legal and regulatory framework, policies, human capital, access to finance and market information. An assessment of these factors revealed that the country lacks a legal and regulatory framework. Therefore, enforcement of regulation is ineffective or non-existent; the policy environment is non-conducive, human capital is inadequate and access to finance and market information is limited, as elaborated below.

Lack of Legal and Regulatory Framework and Institutions – The consultation process revealed that Haiti has no specific law and regulations nor the institutions to regulate the fertilizer market. Although product adulteration does not seem to be a problem in Haiti, there is the potential for blended fertilizer products to be adulterated, more so at the retail level and to a lesser degree at the wholesale level rather than at the blending plant or before importation. Some retailers purchase fertilizer from wholesalers to be sold in roadside markets, in open bags and in small quantities. Regulations on quality control and truth-in-labeling for fertilizer and other agro-inputs are inadequate and/or not effectively enforced due to limited human and financial capital.

Currently, there is no functional soil and fertilizer testing facility in-country other than soil testing kits provided by some NGOs and agricultural development programs in their respective areas of influence (i.e., the WINNER program). The soil testing laboratory at FAMV lacks basic supplies (chemicals), personnel and resources to maintain equipment. Because there is not sufficient demand for the service, the lab cannot maintain a stock of supplies. When there is a request for a soil analysis, chemicals must sometimes first be ordered from the United States; consequently, test results are not furnished in a timely manner. This is the reason why individuals or companies have resorted to sending their soil samples to the DR for analysis.

Another issue related to the lack of regulatory and policing institutions is the illegal leakage of [subsidized] fertilizer available in Haiti across the border to be sold back in the DR, where the product normally originates. Furthermore, there are anecdotes of speculation by wholesalers, distributors and even retailers who hoard fertilizer and artificially create a shortage in the domestic market to allow an increase in prices. At times this cancels out the government subsidy at the source, creating larger than normal profits along the supply chain, mainly at the wholesale level. This situation makes the subsidy ineffective according to the intended purpose of making fertilizer more accessible in terms of quantity and affordability to smallholder and subsistence farmers.

Lack of Clear Government Policy – The policy environment confronting the private sector in Haiti remains non-conducive for business development. Although the GoH has a general policy statement about increasing farmer access to agricultural inputs by subsidizing fertilizer, it does not have a clear policy or strategy about how to address the subsidy. These actions are supported by some donors. Some policymakers do not have faith in the private sector to effectively supply fertilizer to the domestic market, therefore inducing the GoH to intervene through its ad hoc FSP by importing and distributing fertilizer at a subsidized price of up to 80 percent of its landing cost and at times for free.

This action sends the wrong message to private stakeholders interested in importation and distribution, discouraging their participation in the market due to the inability to compete with subsidized or even free products. These government actions create uncertainty in the market and

a type of private sector dependency, forcing them to respond and import only the contracted quantity under the government subsidy program and what the open market demands. Moreover, although the government and donor interventions are well-intentioned, the subsidy policy creates distortions in the marketplace and thereby prevents the realization of the full potential of the private sector.

In addition, this policy of government importation and distribution of subsidized fertilizer is not sustainable over time because of its dependence on foreign aid, mainly Japanese donations. In addition, there are fiscal and technical constraints for implementing a well-managed fertilizer subsidy program, which has resulted in the displacement of commercial fertilizer. Furthermore, it is not clear whether the program has in fact made fertilizer cheaper and more accessible to farmers or has ultimately increased agricultural productivity and production. In light of the typical subsidy program approach of subsidizing the source, it is believed that the subsidy disappears in the domestic market throughout the domestic supply chain, and consequently does not reach the farmer. The main result has been a lack of fertilizer product in the market and, consequently, a higher per unit price, despite the subsidy.

There are arguments in favor and against government intervention in the fertilizer market. Some believe that given the inability of the private sector to supply the quantity needed in the market, it is necessary for government intervention in importation and distribution to ensure that the fertilizer gets where it is most needed at the right price and time. The counter argument is that the private sector's inability to supply the needed quantities at the right price is due to government intervention in the market that has not allowed them to develop an effective and efficient acquisition and distribution system. This is in part due to the neglect of macro-economic policies and underinvestment in infrastructure that would otherwise allow for a more efficient operation of market players.

Private importers have become dependent on the government subsidy program, which presumably finances the private sector importation under contractual obligations. Therefore, they are not willing to take any additional risk. During the times of government withdrawal, they import only the amount of fertilizer they are willing to finance on their own and know is

demanded in the open market without the government subsidy and contracted quantities. Therefore, there is no incentive for these companies to import any quantities outside the FSP contracts. Although fertilizer is considered a tax-free product, without government contracts under the FSP framework, importers must pay five percent minimum tariff applicable to all products entering the country.

Inadequate Human Capital and Knowledge – There is a lack of knowledge by extension workers, wholesalers, retailers and farmers on the technical aspects of inputs, necessary to make proper use of fertilizer. Farmers use limited amounts of fertilizer due to their lack of or limited technical knowledge of the benefits and how to use fertilizer, in addition to low or non-availability in the market. There is also a lack of business management and technical knowledge on the use of inputs like fertilizer by extension agents, agro-dealers and retailers – a situation that could lead to making the wrong recommendations on quantities and applications methods. This creates the risk of economic losses and environmental degradation or pollution. Improving the technical knowledge of retailers will help to assist farmers by providing technical advice in adopting the proper use of fertilizer and other inputs.

Another issue closely related to the lack of knowledge is funding for agricultural research and extension. The GoH and donors have not placed a high priority on agricultural research and extension. Consequently, research and the generation of local knowledge have declined over the past three decades, especially research and the dissemination of crop fertilization.

Input and Output Market Access – Most wholesalers and dealers are concentrated in the larger towns far from where the product is most needed. Shortages of fertilizer are a common and continuous problem in most agricultural areas as a result of the inconsistency of government imports and misallocations, in addition to the lack of local agro-dealers and retailers. Considering the small quantity of product demanded by farmers for the multiple crops grown on typical small plots, there is a disincentive for dealers and retailers to establish their businesses near the farmers. This in turn, raises the farmer's transaction cost of acquiring fertilizer, which further disincentivizes farmers to use fertilizer. This situation is compounded by poor transportation infrastructure, which simultaneously affects input and output markets.

Consequently, the inability of Haitian farmers to afford inputs is linked to low prices of the food commodities they produce, resulting from the lack of market access to the farmer's output.

Limited Access to Finance by Farmers – This consultation found that availability of finance does not seem to be a major issue in Haiti, according to micro-financial institutions, especially when compared with fertilizer availability. However, this view is not shared by agronomists and farmers. According to some agronomists and farmers, access to finance in the rural areas is a major issue, as well as the availability of fertilizer in the market. There is agreement among stakeholders that most farmers lack resources to pay the market price for fertilizer. The low use of fertilizer is in part attributed to a lack of access to credit and high interest rates faced by farmers, especially small farmers. Interest rates for agriculture loans tend to be high in response to the risk typically associated with agricultural production activities. These factors also affect the supply chain, which depends mainly on domestic sources of finance, especially at the wholesale and retail levels. This has a direct effect on the final price of the product at retail.

Loan terms present another obstacle, because they are not compatible with the seasonal nature of farm revenue flows. Consequently, farmers must rely on off-farm work to self-finance their production operation or to pay for loans. Some financiers and farmers mentioned that when they issue and/or receive loans, respectively, the payment conditions are the same as commercial loans. This condition requires that farmers make monthly payments for the loan during the crop cycle, before production is harvested. To meet this requirement, farmers must rely on off-farm work, which can be a major obstacle to acquiring agricultural credit. From the financier's perspective, this is a form of lending risk management.

Consequently, most small dealers and farmers continue to depend on their own sources of funds including off-farm work to fund their activities. They also incur high transaction costs because they cannot buy large quantities and frequent trips to the large towns to acquire inputs increase transaction costs and limit the scale of their businesses. In many cases, even if credit and fertilizer are available, they do not make use of it because of risk aversion behavior due to the high costs of the product and the low profitability of the investment. These are the same reasons

that justify financial institutions not providing credit for agricultural production activities, especially to smallholder and subsistence farmers.

Lack of or Insufficient Market Information – Well-functioning markets require that the actors involved are fully informed about prices, quantities, stocks and transactions in various market segments. In Haiti, there is no institution involved in the collection and dissemination of information on fertilizer or any other agricultural activity. Agro-dealers and farmers are not informed about prices and quantities in various parts of the country. This lack of information prevents them from reacting to market signals and allocating inputs and resources efficiently. In fact, when farmers and some retailers were asked about the government subsidy program, they were not aware of its existence. Even if others were somewhat aware, they did not believe it actually existed, since they had never seen it reflected in the price they pay for fertilizer.

3. *Technical Constraints*

Technical constraints encompass inadequate research and extension support, limited work on soil characterization, classification and mapping, as well as basic research with fertilizer trials for developing sound fertilizer recommendations. These constraints contribute to the lack of knowledge among farmers and dealers on the proper use and sale of inputs. Lack of funding for agricultural research and extension has been a serious issue for decades in Haiti.

In Haiti, there are no official recommendations on fertilizer use. Agronomists that provide technical assistance to farmers generally make fertilization recommendations based on rates established over time. Some of these rates are based on outdated research without considering changes in soil characteristics, fertility tests of specific fields or crop varieties planted. Recommendations and use are generally expressed in the number of 45-kg bags/ha, rather than nutrient-based. Furthermore, there is little scientific support to guide fertilizer application at the field level.

Another major technical constraint is related to the availability of the right type of fertilizer in the market according to Haiti soil and crops requirements. Some specialists have raised the issue of a lack of choices of fertilizer available in Haiti. Fertilizer formulations available in Haiti are not based on soil and crop needs; rather, they are the same developed for the soil conditions in the DR.

Haiti is in effect considered an extension of the DR market. Therefore, these fertilizers do not account for differences in nutrient deficiencies in Haiti. The importation of only a few types of fertilizer formulations is the result of Haiti's dependence on the DR market.

Any practice to address issues constraining adoption of alternative farming systems will not happen without significant investment in extension and the education of farmers. The fact is that given the depleted conditions of soils in Haiti, there is a strong need to develop research and disseminate the results and make use of a combination of organic and inorganic nutrient sources at levels that support maximum economic yields and soil fertility restoration. For highly degraded soils this will require higher than the traditionally recommended levels of fertilizer and amendments and may be an area where the government could make soil fertility investments that provide long-term benefits, most importantly, sustainable agricultural production.

IV. A Proposed National Fertilizer Plan for Haiti

For many years, the GoH has directly participated in the fertilizer market with a stated objective of ensuring a consistent supply of fertilizer in terms of quantity and quality and at an affordable price to farmers, especially the smallholder and subsistence farmers. Increasing agricultural productivity and production and improving farmers' revenues were the expectations. The main mechanism of intervention has been an ad hoc program to subsidize fertilizer. However, given the subsidy program approach targeted to the supply-side of the market, such intervention has not been able to achieve the expected results of accessibility to farmers in term of quantity or price. More importantly, it has failed to increase productivity and production. In fact, based on this assessment finding, fertilizer supply and consumption have been erratic for the past 15 years since the government formally announced the implementation of the subsidy program. In part, the erratic behavior is the result of a variety of government constraints including fiscal and technical constraints and, more importantly, poorly designed policies and lack of a clear strategy in support of fertilizer market development.

In light of these shortcomings and other issues facing the fertilizer market in Haiti, this section provides recommendations for a comprehensive national fertilizer plan to support its market development. This plan is based on the active participation of private importers and distributors and seeks to minimize disruptive effects of government intervention in the supply-side of the market. This proposed plan also includes the implementation of a subsidy program strategy under the basic principle of directly supporting the user and the product (at the demand end of the market), rather than the source (or the supply end of the market). This approach does not ignore the supply-side of the market; rather it calls for indirect support by creating an environment conducive for agribusiness development.

Consequently, there is a need to envision a National Fertilizer Plan and rethink the subsidy program under a new strategy that eliminates these shortcomings and makes the subsidy more effective. It should also improve the efficiency of the public resource use on the subsidy delivery and use of the subsidized product by farmer beneficiaries and support the private sector's own initiatives of investment in market expansion.

A. Vision, Goal and Objectives of a Fertilizer National Plan

1. Vision

An open and competitive fertilizer market in Haiti with minimum direct government involvement beyond what is attributed by any stated law, while allowing private sector import and distribution of fertilizer in appropriate quantities, quality, at the right time and place and at a price affordable to farmers, especially to smallholder and subsistence farmers.

2. Goal

To increase overall domestic agricultural production to reduce food imports through the use of fertilizer and to foster the sustainable utilization of natural resources.

3. General Objective

To achieve higher levels of fertilizer use, especially among smallholder farmers; to improve their productivity and, therefore, increase household food security, raise income and rural employment.

4. Specific Objectives

The strategy, vision, goal and general objectives will be realized through the achievement of the following specific objectives:

1. Create an enabling legal and regulatory environment that allows for public-private sector partnership in the development of the fertilizer industry and market.
2. Improve access to fertilizer for smallholder and subsistence farmers in terms of place, time and affordability.
3. Support private sector development and the expansion of the retail network closer to the farmers, where the product is most needed.
4. Improve utilization of fertilizer and related inputs in a way that is economical and environmentally friendly.
5. Invest in transportation and productive infrastructure improvement.
6. Improve subsidy delivery and production-enhancing services to also increase the demand for fertilizer: i.e., targeted subsidies, access to credit, provision of technical assistance, market access and market information systems (MIS).

B. Priority Strategic Actions

In order to promote the use of fertilizer and its availability, access and affordability, it is necessary for the GoH to take on at least five initiatives:

- Enact and implement a fertilizer law and regulations (see “The Fertilizer Act, 2009” from Tanzania as an example of a fertilizer law in a Developing Country, in Annex 3).
- Issue a clear policy in support of increasing fertilizer use (and other inputs) that includes a subsidy program strategy and credit access to farmers within the legal and regulatory framework.
- Implement a market-friendly program to subsidize fertilizer and other associated production-enhancing inputs.
- Scale up public investment in road and transportation infrastructure and access routes to rural areas.
- Build capacity for the private sector, mainly agro-input dealers and farmers.
- Enhance skills and the knowledge base in the use of organic and inorganic fertilizer and other inputs among farmers.

These actions can be categorized in short-, medium- and long-term actions.

1. Short-Term Actions

a. The Establishment of a Legal and Regulatory Framework

The consultation process revealed that Haiti does not have a legal framework to guide and regulate the fertilizer market. Therefore, there is a potential for blended fertilizer products to be adulterated, more so at the retail level than at the blending plant or before importation and at wholesale. Product adulteration does not seem to be a problem in Haiti, according to the consultation, but if it exists, it could counteract the productive capacity of fertilizer, a situation that is often associated with negative agricultural development. Therefore at the core of a market development strategy is the establishment of a clear legal framework, necessary to develop the confidence of the private sector to invest in market expansion and development.

The law should aim to regulate the manufacture/processing, importation, sale and use of inorganic and organic fertilizers in agricultural production, encourage fair competition and establish minimum standards of quality in terms of purity and truth-in-labeling. These efforts

will protect the market players along the supply chain, especially the end user and the environment. This law could also set recommended standards for agro-input dealer participation in fertilizer marketing.

Establishment of Regulatory Institutions

An unregulated market allows private sector operators to potentially generate greater than normal profits. This results from inadequate competitive practices accentuated by high collusion among the traders, especially when there is government intervention through a subsidy program. To eliminate these potential rent-seeking opportunities by all market players calls for the GoH to step out of the market and begin playing the role of regulators and monitor of the fertilizer market.

It is advised, within the legal purview of the government, that a Fertilizer Market Regulatory Board be established to provide regulatory services. This board would establish the market regulations, including the implementation of a subsidy program, according to established law. This is in addition to ensuring that other public goods and services are provided to support better functioning of the market. The board would also be responsible for: setting fertilizer market standards; private sector and public-private sector dispute resolutions and arbitration; issuance of certifications for importation, production and distribution; and the provision of soil analytical services to facilitate the development of new fertilizer recommendations, among other responsibilities.

In addition, such laws and regulations must be supported by policing and enforcement. The enforcement system must include the strengthening of existing laboratories or the establishment of independent laboratories for testing, with qualified personnel for policing and control. This enforcing body is expected to play a major role in improving fertilizer quality in order to promote agricultural development.

b. Improving the Policy and Strategy for Implementation of the Fertilizer Subsidy Program

The fertilizer market does not work efficiently in Haiti because of direct government intervention in the supply-side of the market, which has come to discourage private sector

participation in importation and/or distribution. Government intervention has taken place at the expense of neglecting the provision of adequate public goods, particularly in rural areas, creating serious structural market constraints. These interventions and lack of investment in the sector has made fertilizer scarce and expensive for rural farmers, creating a vicious cycle of direct government intervention in the market.

Private operators in the fertilizer trade have relatively small coverage across the country, with distribution outlets concentrated in main trading centers like the Artibonite and Kenscoff areas, which combined consume up to 80 percent of the imported fertilizer. This issue creates serious problems with fertilizer access by small farmers. In view of this, and to incentivize the operators to expand their market closer to the farmers, the GoH should implement through a neutral or autonomous third party institution or organization, a more market-friendly subsidy program for a minimum period of five years to a maximum of 10 years. This will allow sufficient time for farmers to adapt to using fertilizer in their production process and allow distributors/operators at all levels to adapt to increasing demand.

Under this subsidy strategy, the roles of government and private sector importation and distribution must be well-defined to make the subsidy more effective. Fertilizer procurement, importation, transportation and distribution must be done by the private sector, given the already established structures and mechanisms for performing such a role. The government's role should be: (a) to create a conducive policy and macro-economic framework for the private sector to perform its expected role of supplying the subsidized product; and (b) to provide purchasing power support to farmers to incentivize demand.

In other words, the role of the private sector is to supply the subsidized product in response to the demand incentives induced by the government. The government's role is to directly incentivize demand and indirectly support the supply, not by subsidizing supply (importation and distribution) but by creating a conducive environment. This would include enacting laws and regulations, with policies of investing in those areas that will facilitate the private sector to do business and incentivize them to invest in expanding their business.

A fertilizer subsidy strategy to “support the user and the product, not the source,” allows the GoH to better support fertilizer market development by providing purchasing power support to the farmers. The idea behind this strategy is that the government should not interfere with the fertilizer market supply conduct, but should influence private sector performance and support fertilizer demand as a way to incentivize supply (a demand-pull approach). This contributes to market development and the expansion of the private distribution network to bring the product closer to the farmer. This approach is known as a market-friendly subsidy strategy, which must have the following components:

1. A subsidy program transition period of up to five years.
2. Targeting instruments according to government goals of supporting a region, production sector, a specific product or a segment of the farmer population, or a combination of some or all of the above. The targeting instruments should be focused toward the neediest of farmers, primarily those that are most likely to make the transition from subsistence to commercial farmers, to avoid displacing commercial purchases. This avoids disrupting the private sector’s normal commercial activities.
3. A time-limited intervention, which implies the development of a subsidy program exit plan.
4. Include the implementation of subsidy effectiveness-enhancing measures by addressing the market failures that restrict the availability and accessibility of fertilizer by farmers (e.g., access to credit, research and extension, provision of technical assistance and trainings, market access, etc.).

In doing so, this strategy is expected to improve the affordability (by offering discount vouchers or coupons) and accessibility of fertilizer by the targeted resource-poor farmers, at least in a short term, while farmers develop the culture and realize the benefits of using fertilizer in their crops. During this period, the private supply sector is also expected to realize the benefits of market expansion.

A Subsidy Transition Program

Given the prior neglect and perhaps the state of readiness of the private sector to perform their expected role, and of the GoH to implement the proposed strategy, a transition period of up to five years may be a reasonable proposition.

Under this transition period, it is proposed that the government intervention in the supply-side is reduced or eliminated by allowing the private sector to acquire, import and distribute the subsidized product. For this to take place, the government must allocate and set funds aside to meet the contractual obligations (subsidy) with private importers to bring the product in-country under the FSP. The funding must be allocated in a reducing proportion for importation and for establishing the proper conditions for a market-friendly/targeted subsidy strategy. For example: in the first year, allocate 80 percent of funds to meet contractual agreements with importers and 20 percent to begin establishing the basis for a friendly/targeted subsidy strategy. This proportion can be decreased/increased during three to four years, i.e., 60/40, 30/70, 0/100. While the funding to directly support private importation is reduced, the investment in setting up the new subsidy strategy is increased, as well as investment in creating the conditions for better private sector performance. Then the government will withdraw from directly supporting fertilizer importation and will switch to support the demand by providing purchasing support to farmers.

During this transition period, the government's main role will be concentrating its efforts and resources on establishing the basis for targeting beneficiaries and the regulation of the fertilizer market. A census must be used to identify beneficiary farmers by poverty-targeting approaches.

In addition, it is expected that the scarce resources of the government will be put to other equally important uses. However, in areas of total market failures, where there is no incentive for the private sector to supply the market, the GoH will be responsible for the transportation and distribution of fertilizer using state delivery systems. At the same time, the GoH must invest in improving conditions for the private sector to eventually serve such markets. Clear contract arrangements between the government and the private sector must be encouraged in implementing this transitional subsidy fertilizer intervention by involving a stakeholder committee on procurement and distribution of fertilizer.

This transition period is expected to help improve the mistrust that currently exists between the GoH and the private sector and enhance PPP through definition of roles between the government and the private sector. Eventually, there will be increased private sector capacity to

carry out the entire process of procurement and distribution. The process could also promote joint future planning between the government and private sector. This will help the government and the private sector to identify the gaps that the program may fail to cover and, hence, ensure reasonable sharing of the fertilizer market development efforts. In doing so, issues of uncertainty in the fertilizer supply by the private sector will be eliminated. For example, during the transition period, it is possible to identify public resources that can be useful to expand private sector distribution, such as government warehouses that could be rented to agro-input dealers to complement the distribution of fertilizer.

The Implementation of a Voucher Program

Use of discount coupons or vouchers is an important design feature for well-managed subsidy programs. They improve the ability to target the subsidy to the intended beneficiaries. Under this strategy, it is encouraged to use and distribute vouchers, which farmers can complement with cash in exchange for fertilizer. The vouchers are to increase the purchasing power of beneficiary farmers to acquire fertilizer and are expected to increase effective demand of fertilizer. The use of vouchers can be instrumental in increasing fertilizer demand in areas that are typically underserved by the private distribution network.

The provision of vouchers as a means of subsidy to needy farmers, especially to those in a transition stage to semi-commercial farming, is expected to eventually lead to the development of the private sector. Vouchers entitle individual beneficiaries to a price discount that is a saving equivalent to the face value of the voucher. Even more importantly, vouchers provide better access to the subsidized product by the intended beneficiary, in terms of price. In addition, a well-targeted voucher program will prevent crowding out the private sector by avoiding the displacement of commercial fertilizer, since it would be made available only to farmers who could not otherwise afford to pay the full market price.

The establishment and implementation of a voucher program are perhaps the most critical steps for a successful market-friendly fertilizer subsidy strategy. The voucher program must be well-managed in a transparent way to avoid corruption and rent-seeking opportunities at all levels. If the input voucher system is not implemented well, it can compromise the performance of the subsidy program and the private sector, further discouraging their participation in the

market. Therefore, there is a need to simplify the distribution and redemption of vouchers and the subsidized product in a way that is objective, transparent and functional.

The selection of beneficiaries should be a transparent procedure, and participating farmer selections should not be on the basis of political patronage. All farmers in a selected targeted population must be issued vouchers that they can use on the open market to buy fertilizer. The body responsible for selection and distribution of vouchers should be an autonomous institution, but perhaps linked to the MANRRD.

Proposed Subsidy Program Exit Plan

A specific time frame for the subsidy program entails a specific date for completion of the program in addition to an exit plan consisting of the graduation of groups of beneficiaries after participation in the program. Having a time frame and a strategy to ensure that farmers realize the benefits of using the subsidized product (fertilizer) and are also proficient in its use, consequently reducing the need of the subsidy, will also improve the overall performance of the subsidy program. The exit plan will encourage governments to set goals and targets that are to be met within a specific time frame. It will also reduce the potential for establishing a dependency syndrome among the beneficiaries and undermining their entrepreneurial abilities. An exit plan will also help to avoid a fiscal imbalance while ensuring sustainability of the program outcomes.

The subsidy program should deliberately enforce entrepreneurial capacities of beneficiaries by enrolling them for a predetermined time period, after which they should be assessed and graduated either as small commercial farmers or referred to other [social protection/welfare] programs. This process is expected to encourage farmers to make use of their beneficiary rights and privileges effectively and avoid creating dependency among them.

Therefore, since subsidy/intervention programs are not sustainable in the long run, whether fiscally budgeted or donor-funded, there is a need for an exit plan. With this idea in mind, farmers' purchasing power should be enhanced through a combination of the following stages:

- During the initial stage, starting with the transition period, it will be necessary to identify target groups, perhaps based on wealth ranking and the ability to purchase inputs. The

identification of target groups will allow the determination of who should or should not be eligible for the subsidy program. Of those eligible, who should receive a higher level of subsidy and other types of support such as access to credit, technical assistance and for how long. The beneficiaries identified must not exceed the funds assigned to the subsidy.

- Just as during the transition period, once farmers' purchasing support has initiated, it must be gradually reduced, by reducing the size of the subsidy (or value of the voucher) over five to 10 years, according to identified farmer groups.

In order to achieve the graduation of farmers from receiving purchasing support, it is also necessary to implement other policy measures to improve the effectiveness of the subsidy program and the efficiency of the agricultural production process.

c. Establishment of a Temporary Blended Fertilizer Buffer Stock

The intent of creating a fertilizer buffer stock is to ensure that fertilizer is supplied and available to its consumers for timely use in the fields while helping regulate or stabilize fertilizer prices in the domestic market during the subsidy program transition period. Initially, the GoH should initiate the program using a PPP modality, under which a fund will be established to serve all players in the fertilizer market. The private sector will be allowed to buy fertilizer at cost from the buffer stock for distribution throughout the country. This stock becomes even more relevant in time of crisis, whether it is international or domestic, political or because of natural disaster.

For the operators to have access to this buffer stock, they must affiliate with the fund. Eventually, the fund is expected to be wholly private sector-operated. The buffer stock will help to determine the annual fertilizer demand. This will ensure that the fertilizer in the buffer stock has a disposal market that in turn will stimulate continuous orders of fertilizer into the country.

2. Short- to Medium-Term Actions

a. Implementation of Subsidy and Production-Enhancing and Effectiveness Policies

The fertilizer market in Haiti has experienced a series of market failures, especially in rural areas, as a result of years of neglect. Therefore, low to no investment in adequate public goods and services, such as access to feeder roads, agricultural research and production technical assistance, credit availability and accessibility, among other services, have made the availability,

accessibility and use of fertilizer more difficult. The influence of these factors on the final price of fertilizer can make its use prohibitive to smallholder and subsistence farmers. However, the consideration of how high the price of fertilizer is could be relative to the output price, which at the same time is a function of market access (in terms of information and physical access).

Improving Productive Infrastructure and Market Access

In order to improve or increase the effectiveness of a fertilizer subsidy and that of the subsidized product, it is necessary to improve basic agricultural infrastructure and services. One of the key public goods that can help increase the flow and use of fertilizer is an improved road network. By implementing policy measures – to at least restore existing roads in addition to building new feeder roads and other transportation infrastructure to expand the existing distribution network – the GoH has the potential to help increase the flow of agricultural inputs to farmers and provide access for farmers to move their outputs to market. This effort would reduce the cost of fertilizer supply while reducing the transaction cost of bringing farmers output to the market.

In addition, it is also recommended to rebuild and expand productive infrastructure like irrigation, essential for farmers to make effective use of inputs like fertilizer. These investments in infrastructure, in an aggregate, can potentially incentivize agricultural diversification, increase fertilizer use, obtain higher yields and overall output, allow for better output prices and contribute to higher farmers' incomes. To attain this, the implementing institutions must coordinate and collaborate with infrastructure and services projects currently being implemented by the GoH or other donors and organizations.

To complement investments in market access, it is also necessary to link farmers to markets, for example, by using mechanisms such as contract farming and out-grower schemes to create an outlet – therefore, giving higher value to the farmers' products and further incentivizing the use of fertilizer.

Provision of Services

The private sector is said to be the engine of growth that benefits the poor. However, to achieve this, it must have access to goods and services that allow the sector to operate effectively

and efficiently. The private sector will be able to do this in a situation where it has the necessary enhanced capacity. Normally, capacity building comprises a systematic combination of human resources, sound operational systems and institutions that lead to the attainment of strategies and objectives in an economy. In the case of Haiti, a systematic combination of human resources, working systems and institutions is likely to result in increased crop productivity, which may eventually increase food security and incomes at household and national levels. This strategy must ensure that a viable agro-dealer network thrives in the country.

Research and Extension

Another finding of the consultation is that Haitian farmers do not have the proper technical knowledge and therefore are not well aware of the proper use of fertilizer. Farmers make use of fertilizer without previous knowledge of soil fertility and crop needs. They rely on the fertilizer formulations available in the market, regardless of soil fertility and individual crop requirements. In addition, the existing recommendations for crops seem to be outdated, presumably based on basic research developed during the 1970s and 1980s. This implies that farmers, in most cases, are not applying the proper amounts of nutrients according to specific crops and soils conditions, risking economic losses, resource depletion and/or environmental contamination depending on whether fertilizer is being under or overly used. In addition, by farmers not applying the proper amount of nutrient according to crop needs and soil conditions, they may be compromising crop yields and food nutritional quality, causing food shortages and human nutritional deficiencies.

Therefore, the fertilizer plan in the context of the subsidy strategy should aim to increase the use of fertilizer and output profitability among farmers and private operators through the provision of appropriate services to determine the type and quantity of fertilizer needed, according to specific soil conditions and crops. This approach requires establishing soil testing services and carry out research to determine the proper amount of nutrients required according to the crops being planted and specific soil needs. This is in addition to efforts to improve the synchronization of crop nutrient requirements with soil fertility levels and the delivery of the right type of fertilizer formulations, according to the established needs.

To achieve this, the government must revive or revamp and intensify the research and extension services for research on fertilizer rates, according to crops and soils, application techniques and other relevant practices. One way to do this is perhaps by establishing research (by farmers and for farmers) with the collaboration of the private sector to adapt the practices to their conditions. Farmers and partners can then disseminate and deliver the research innovations through field days, on-farm demonstrations, day trainings, etc. This innovation will become instrumental to agricultural sector development if it is consistent with the advice being given across different avenues of communication and if it is compatible with the agronomic requirements and practices of specific crops and varieties.

b. Improve Skills and Knowledge in Fertilizer Use

Currently, ineffective and inefficient utilization of fertilizer is a result of inadequate skills and knowledge among the majority of stakeholders in the fertilizer value chain. Under the proposed plan, it is recommended to implement training programs to enhance integrated utilization of organic and inorganic fertilizer and related inputs in a way that is economically and environmentally sound. This will be achieved by first conducting a training needs assessment in the areas of fertilizer use, handling and management – then developing other trainings and training manuals. Competent fertilizer specialists must be identified to undergo comprehensive trainings.

Extension Specialists Training in Fertilizer Use, Handling and Management

These are comprehensive, pluralistic trainings for extension workers who will, in turn, train agro-dealers and farmers (training of trainers [ToT]). The training must be organized as regular refresher courses to update and maintain sound knowledge levels among extension specialists in the areas of fertilizer use, handling and management.

Training Agro-Input Dealers in Fertilizer Use, Handling, Management and Marketing

This training must focus on fertilizer use and management, sales and marketing through informal education sessions to ensure that agro-dealers, especially those who may have limited knowledge, are brought on board by channeling the appropriate fertilizer management, sales and

marketing messages, through visual media. It is expected that an adequate training of these agro-dealers will ensure fertilizer quality and that sub-standard fertilizers are not brought onto the market. A rapid assessment could also be used to identify the agro-dealers and their fertilizer technical knowledge and business acumen to better target the trainings.

Furthermore, this training will empower agro-dealers to advise farmers and reinforce their knowledge on the use and management of fertilizer. This approach becomes more relevant in situations where there is an absence or sporadic presence of government extension services as the result of government financial and human resource limitations. At the same time, this approach will help make the agro-dealers' businesses more competitive while facilitating the enforcement of site-specific recommendations on fertilizer use. The training should also be designed to promote the advantages of small packages for all types of fertilizer for the rural retail markets, as demanded by the smallholder and subsistence farmers in Haiti.

Train Farmers in Fertilizer Use, Handling and Management

The program must organize informal training for farmers to ensure effective and efficient handling, use and management of fertilizer, as well as recommended doses according to their planted crops and agro-ecological conditions. These trainings can be complemented with demonstrations plots, field days, agriculture shows, leaflets and radio programs. In the course of these trainings, lead farmers should be identified for further dissemination of the fertilizer technologies, to establish demonstration plots, etc.

Promote Integrated Use of Organic and Inorganic Fertilizer

The use of inorganic fertilizer is in response to an immediate need to replace soil nutrients lost due to cultivation practices and soil depletion. However, it does not improve substantially the physical characteristics of the soil, thus limiting its sustainable productivity if not used properly. Excessive use of inorganic fertilizer has been linked and believed to contribute to environmental contamination. To the extent possible, the plan must encourage conservation farming through balanced use of both inorganic fertilizer and organic materials as sources of nutrients. This effort will restore organic matter content and improve the cationic

exchange in the soil, and therefore build the capacity to retain nutrients and improve soil fertility, which eventually increases soil productivity, perhaps in a more environmentally friendly and sustainable way.

In the long term, organic material incorporated into the soil will also release nutrients to the soil and hence improve its fertility; it is likely that the amount of inorganic fertilizer to be applied may decrease depending on the technical and intensification production practices. Organic inputs often increase the efficiency of inorganic fertilizers and thus are considered as a means to increase profitability of inorganic fertilizer use by supplying additional nutrients (e.g., sulfur) and improving water infiltration. Although, organic fertilizers could also contribute to environmental contamination and actually may be a greater threat due to less control over nutrient release rates.

3. *Medium-Term Actions*

a. Formation of Farmer and Agro-Input Dealer Associations and Cooperatives

The idea behind the concept of associations and cooperatives is to strategize on how economies of scale of a farmer group and/or agro-dealers could be increased by operating as a group rather than individually by pooling their resources and optimizing economies-of-scale. By pooling resources, farmers and agro-input dealers will not only be in a position to strengthen their collateral security for accessing credit facilities but will also be able to procure large volumes of fertilizer for sale in their retail outlets. Associations of beneficiary farmers, agro-input dealers and other private sector players can be instrumental in the planning and implementation of the subsidy program. For example, they can facilitate implementation of sensitization campaigns, program reviews, re-planning and implementation and monitoring of the program.

Farmer organizations such as farmer cooperatives or associations will be the entry points for the education campaigns. The farmer organizations can also be used as entry points and as collateral securities for credit access. Banks will issue credit to the farmer organizations and not to individual farmers. In the same manner, loan recoveries will be a responsibility of the farmer organizations that signed for the loan. In addition, the farmer organizations will be used as vehicles for consolidating fertilizer needs; applications and channeling of loans; distribution of

fertilizer and disseminating fertilizer-related technologies; and collection of payments for loan repayment to the bank.

This strategy of forming associations becomes highly relevant to ensure the sustainability of the farmer groups' agro-input retail stores being supported by the WINNER program once the program has ended (see Annex 1).

Organized farmer and dealer groups could lead to the creation and development of an apex representative organization that includes all players in the market: importers, distributors and farmers. The role of such an organization could be lobbying the government and other stakeholders on issues affecting fertilizer marketing, such as foreign policy issues, credit issues, etc., for the enactment and implementation of sound policies to improve the fertilizer market. Therefore, the program should also include leadership training sessions for the associations and cooperatives to ensure that their roles in the policy-driven process are performed effectively.

b. Improve Fertilizer Credit Systems

One way that the fertilizer credit system can be improved is by establishing a National Fertilizer Agricultural Fund. This credit system can be a PPP, which will put into place mechanisms for minimizing the willful default element in most credit beneficiary groups. The system will prevent individuals from obtaining a number of credits simultaneously from several other lenders or using different names to access new loans while in default on current loans. The fund should also be integrated with other in-country initiatives that are underway to reduce credit default risk and develop and introduce risk management instruments (i.e., crop indexed insurance by IICA, the USAID-funded HIFIVE program, among others) to reduce the credit default as a result of natural disasters such as excessive rains or droughts and other risks.

Due to the informal land tenure rights leading to land holding insecurity in Haiti, commercial banks traditionally do not recognize rural farmlands as collateral for credit. Thus, rural farmers are denied access to credit for agricultural production. The fund could also be used as a guaranteed fund to entice banks to lend to the agriculture sector and to consider using permanent rural infrastructure as collateral security for credit eligibility so that farmers in rural areas will be able to access credit. A part of this approach is the promotion of non-traditional,

high-value crops among the smallholder farmers to increase farmers' cash flow, which will be tendered for credit eligibility at the commercial banks.

Furthermore, the fund should implement intense education campaigns on the benefits and penalties of effective loan repayments and of defaults, respectively. These education campaigns can be channeled through farmer organizations as well.

4. *Medium- to Long-Term Actions*

a. Facilitate the Establishment of a Fertilizer Blending Plant

Domestic blending of fertilizer could be a potentially efficient and effective way to reduce the high cost of fertilizer and, consequently, could facilitate its access to smallholder farmers. It would also act as a long-term alternative to blended fertilizer buffer stock. However, Haiti does not have natural resources (i.e., natural gas and sulfuric acid) or deposits (i.e., phosphate rock) that could be tapped for producing basic fertilizer material for blending. Therefore, the country must rely on the importation of fertilizer raw materials for blending.

Considering that other countries in the region have successfully established blending plants despite the lack of domestic fertilizer production, it is possible to do so in Haiti based on the importation of single nutrient fertilizers in bulk, granulated form. In doing so, it is estimated that the cost of fertilizer could be reduced by as much as 40 percent if most of the granulated single nutrient fertilizers were locally blended (see Annex 2 for a more detailed analysis of establishing a fertilizer blending plant in Haiti).

As the quantity of fertilizer consumed in Haiti increases, it is recommended to look into the feasibility of establishing a blending plant in-country. For this endeavor, initially, a PPP should be promoted to allow the private sector to utilize, at the minimum, public market and storage infrastructure. Eventually it is recommended that the operation should be a wholly private sector operation. The Ministry of Finance should consider allowing a tax holiday for five or more years to encourage private sector investment in the blending plant.

b. Develop Market Information Systems

Haiti's fertilizer and input market suffers from scant fertilizer production and marketing statistics and information. For all market players to make informed decisions in the fertilizer market, information asymmetry should be reduced. This means that there is a need for establishing or improving existing market and fertilizer information systems to make such information available to fertilizer importers, distributors and farmers for profitable decision-making.

Provision of information to the market players would facilitate the attainment of this objective. It is for this reason that a plan must be put in place with mechanisms for conducting domestic and international fertilizer production and marketing surveys, analyzing the data and disseminating the fertilizer production levels and price information to the fertilizer market players. The system will also put in place mechanisms for developing fertilizer production and marketing databases. Awareness campaigns on appropriate fertilizer market norms and standards, in addition to practical and relevant information to increase fertilizer profitability, would encourage widespread adoption of innovations by farmers.

To achieve this, it will be necessary to set up an active data collection center to specifically collect, analyze and disseminate fertilizer, agricultural production and marketing-related information and statistics, which can either be owned or operated by the GoH, the private sector or under a PPP. This initiative is expected to encourage both the public and private sectors to conduct market research in both rural areas and international arenas. The international data will help to explain how the international fertilizer suppliers operate and promote the domestic fertilizer market operators in a way that maximizes economies-of-scale in the acquisition of fertilizer in the international market.

In addition, the system will allow the farming community, traders, etc., to stay informed on the availability and use of fertilizer production statistics and information to ensure they are able to plan properly. The fertilizer production statistics and information will be concentrated in a subsection of the MIS, which must be set up in strategic areas throughout the country. Weekly fertilizer prices, quantities in different markets and potential demand areas will be posted and

broadcast through different communications means, especially those more accessible to the targeted audience.

c. Establish Plant Nutrient Requirements and Soil Ecological Specification

As found during the consultation, fertilizer use in Haiti does not address crop nutrient requirements versus soil fertility status. Part of the problem is the lack of soil testing to determine soil fertility and the availability of fertilizer formulations that presumably are not formulated according to crop and soil requirements in Haiti. However, in order to determine and make better soil nutrient recommendations, it is also necessary to characterize and classify the soils.

Soil characterization, classification and mapping could be very useful, to determine the chemical and physical characteristics that affect the availability of plant nutrients and the response to fertilizer application. However, characterization and classification on their own cannot be used to generate fertilizer recommendations. Ideally, completion of systematic studies, at least in major agricultural areas, in conjunction with fertilizer response trials, would enable researchers to better categorize soils from different areas in order to yield better recommendations.

It is recommended to establish research to complete the characterization, classification and mapping of Haiti's soils. These soil classification studies should be followed by research on crop response to fertilization based on fertilizer trials in various agro-ecological zones and the use of computer simulations available for some crops to improve fertilizer recommendations. Based on this research, the MANRRD, in collaboration with the private sector and key stakeholders, would be able to provide cost-effective fertilizer formulations and recommendations.

C. Develop Monitoring and Evaluation Systems

To determine the effectiveness of a program and to take corrective actions require a sound monitoring and evaluation system. A baseline survey is required during the first year of the plan implementation.

It is recommended that a household survey be undertaken with stakeholder consultations and partnerships to facilitate the implementation of the program. This data and analyzed statistics from the baseline will be a precursor for the intended fertilizer production and marketing information system to be set up in the MANRRD. It can also be implemented at the same time or in conjunction with the census to identify subsidy beneficiaries, characterized by income to determine the amount of subsidy and/or services to be provided.

In the implementation phase of the program, information from administrative reports will be summarized and entered into the MIS database. That information includes: fertilizer production statistics; fertilizer imports; price data and quantities marketed; utilization; and produce prices and production volumes. Multi-stakeholder review meetings should be conducted on a quarterly basis. Verification visits must also be used to learn what happens in different stakeholder arenas. The existing structures of various stakeholders will be deployed to collect monitoring data. A data-sharing system and reports must be put in place, coordinated by the MANRRD office, where the fertilizer production and marketing information systems will be housed. Targeted monitoring surveys will be conducted every six months, in addition to annual evaluations.

D. Proposed Funding Mechanisms

The activities proposed in this plan are expected to be funded by the Government of Haiti and supplemented in coordination with donor initiatives in-country.

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VI. Annex 1

Sustainability of USAID/WINNER-Supported Agro-Input Supply Stores

Within the framework of the USAID/WINNER program, there is a commitment to provide grants in support of agribusiness development in Haiti. The program determined that the best way to invest such funds was to support farmers' organizations by facilitating the creation of agro-input stores throughout the country. The program has been supporting 39 agro-input stores associated with local farmer organizations in the different intervention zones (Gonaives, Plateau Central, Arcahaie, Kenscoff and Plaine du Cul-de-Sac). The support offered to the stores is in-kind with the provision of fertilizer and other agro-inputs at a subsidized price that started at 80 percent of its importation cost, with a gradual reduction of the discount (subsidy) down to zero in three to five years. The objective has been to help capitalize the stores through the provision of inputs; USAID/WINNER has been involved in direct importation.

In an effort to increase the sustainability of the support initiated by the program, USAID/WINNER has been providing, in addition to financial support, technical assistance in the administration and management of the supply stores. Store personnel have been provided with technical knowledge of the inputs they dispense, including fertilizer. The main purpose has been to ensure healthy, effective and durable management of the resources provided, improve the administration and management of the stores and to give personnel the tools to provide basic technical advice to farmers.

Since the USAID/WINNER program has a limited life, there is a concern about the sustainability of the supported stores. Therefore, the program is looking for a strategy to successfully withdraw from supporting the stores, while also increasing the probability of survival and, more importantly, the sustainability of the stores once the program has come to an end and support ends. We make the following recommendations.

Recommendations:

To increase the chances of the stores' survival and ensure sustainable operation once the USAID/WINNER program has ended, it is recommended to:

- Escalate and intensify the level of training currently being provided to the stores, mainly in administration and management skills and product technical knowledge of the store operators. The increase of the store personnel's technical knowledge is expected to give an advantage to the stores by providing basic technical advice to farmers on the type and proper use of agro-inputs. Therefore, farmers may give preference to shop in those stores to supply their needs.
- Training should also be revamped to include training in organizational and leadership skills, especially to the key personnel of the stores or members from the farmer organizations to incentivize the creation of a larger umbrella organization or association that would mainly embrace the stores currently supported by the program.
- The idea behind this concept of associations is to strategize by operating as a group rather than individually and pooling their resources and optimizing economies-of-scale. By pooling resources, these agro-input dealers will not only be in a position to strengthen their collateral security for accessing credit facilities but will also have better bargaining power and procure large volumes of fertilizer for sale in their retail outlets.
- The association can also be used as entry point and as collateral security for credit access. Banks will issue credit to the association not to individual stores. In the same manner, loan recoveries will be a responsibility of the organization that signed for the bank loan.
- In addition, these associations can be instrumental in planning and implementing the subsidy program. For example, they can facilitate implementation of sensitization campaigns, program reviews, re-planning and implementation and monitoring of the program.

In summary, the USAID/WINNER stores association can be used as a vehicle for consolidating fertilizer needs; applications for and channeling loans; distribution of fertilizer and disseminating fertilizer-related technologies; and the collection of loan payments to the bank. Furthermore, this association can be the entry point for any educational campaigns implemented by the government or any other institution.

VII. Annex 2

Establishment of a New Fertilizer Blending Plant: A Feasibility Analysis

Opinions vary on whether a fertilizer blending plant is needed in Haiti. In discussing fertilizer shortages, some believe that a blending plant should be established in order to increase fertilizer availability, as well as to ensure the availability of a wider range of fertilizer formulations. At least two attempts in the past were unsuccessful for unknown reasons, but presumably because of the small (although increasing) size of the Haitian market. Currently, the fertilizer market is dominated by two firms from the DR: FERSAN and FERQUIDO. Therefore, many believe that success would require the participation of DR manufacturers.

The purpose of this preliminary analysis is to set the background for a detailed market and a full financial and economic feasibility study for the establishment of a fertilizer blending plant in Haiti. This analysis should not be interpreted as conclusive, but perhaps as a preamble and to determine whether a full-blown economic and financial analysis may be necessary to arrive at more concrete conclusions and decide whether or not investment in a fertilizer blending plant should be conducted in Haiti.

Currently, there are two initiatives to establish a fertilizer blending plant in Haiti:

1. A government initiative – Under this initiative, the Haitian president approached the Government of Taiwan to support and finance the establishment of a 40,000 mtpy blending plant in Lafiteau, about 17 km outside of Port-au-Prince. The objective of the president is to comply with his campaign promise to reactivate the agriculture sector, considering that fertilizer is an important input for agricultural development and because Haiti does not have a fertilizer facility to supply the market, but depends on imports mainly from the DR. Consequently, Haiti would gain autonomy in importation and blending production of fertilizer.
2. Private sector initiative – Under the private sector, there is an initiative for a joint venture between the GB Group and the DR fertilizer producer, FERSAN (Fertilizers of Santo Domingo), to establish a fertilizer blending plant in Haiti. However, this initiative is still at a conceptual stage. Potential stakeholders are waiting for government actions and a clear policy message regarding their involvement in the fertilizer market before they move forward with a

financial and economic feasibility study. A contractor has already been identified. The GB Group and FERSAN initiative is an attempt to respond to a growing need in-country and to take advantage of a business opportunity in the fertilizer market, in addition to diversifying their investment portfolios in the agribusiness sector.

Objective of Establishing a Fertilizer Plant in Haiti

In any case, whether a public, private or PPP investment, the objective of establishing a fertilizer blending plant in Haiti should be to ensure production, continuous and consistent fertilizer supply to the Haitian domestic market. The fertilizer product should be consistent with the local needs in terms of formulation type, quantity, quality, time and place and at the right price while gaining independence of importation from a single source and creating competition in the domestic market. In the process, it should contribute to the government's goal and programs for agricultural and rural development.

Description of a Blending Process and Equipment, Including Bagging

The term 'bulk blending of fertilizer' consists of the physical mixing of different basic nutrient dry fertilizer materials to obtain a desired nutrient ratio in a uniform concentration. Therefore, the purpose of a fertilizer blending facility is to handle solid fertilizer materials, mixing and bagging, typically in 45- to 50-kg plastic-lined bags. The typical process is as follows:

- Acquisition of the basic fertilizer materials in granular form.
- Unloading and storage of the basic fertilizer materials into a bulk storage warehouse, which divides to store the different fertilizer materials separately.
- Reclaiming the stored basic material, weighing and mechanically mixing them to achieve the desired blended product with the grade and nutrient ratio.
- Bagging the blended product. The bagging process could also include straight bagging of the basic nutrient raw material, i.e., urea, when marketed as a single nutrient fertilizer.

Engineering of a Fertilizer Blending Plant

In terms of engineering in the establishment of a plant, a basic consideration is the availability or construction of a building for the installation of the blending and bagging

equipment. This facility must have enough room to store the raw product, install blending equipment and store the blended product. Depending on the plant scenario, it may require an area under roof between 1,200 to 2,300 m², to store between 3,000 to 5,000 mt of basic product material and blended product. In addition, a separate building or an extension to the existing building space will be necessary for administrative offices and perhaps a maintenance workshop.

Depending on financial, economic and social considerations, the design of a blending plant can be fully or semi-automated in the handling of the basic material for blending and of the final product for bagging. Whichever the automation level of the plant, the basic or typical plant process is the same.

Technical, Economic and Financial and Political Considerations

Haiti currently relies completely on the importation of fertilizer already bagged without domestic processing value added, other than marketing. However, there are major issues facing any investment in a blended fertilizer production operation in Haiti:

- An extremely poor farmer population.
- A relatively small market.
- A high level of market instability resulting from a lack of legal and regulatory framework and direct government interference in the normal market conduct and performance.
- A heavy reliance on foreign aid for the acquisition of fertilizer, a situation that is not sustainable.
- Strong competition from already established importers associated with foreign industry in the DR, which supplies most of the Haitian market (about 80 percent of market needs).

Therefore, in light of the number of constraints, the establishment of a blending plant in Haiti and the development of its market will require a mix of institutional, technical, financial and commercial skills, in addition to supportive government policies.

Given the situation in Haiti, it may be the right time to garner support to enact policies and regulations and create a conducive investment environment for establishing a fertilizer blending plant. Haiti was hit with a series of natural disasters in 2008 (hurricanes) and 2010

(devastating earthquake and hurricane). A new government has been installed and is committed to support development of the agricultural sector. In terms of financial concerns, the series of natural disasters and the government political will has attracted the interest of donors and financial institutions (uni- and multi-lateral) to support the government's development efforts. Therefore, this project may receive strong financial support. However, there are some other factors to take into consideration before a final decision is made to establish a plant.

Technical Considerations

- Based on a purely technical viewpoint, the establishment of a blending plant is feasible and perhaps would be the most promising alternative relative to an actual production facility based on natural resources (natural gas, phosphate rock, etc.), since the country does not have commercially viable resources available to produce basic fertilizer material. This factor is in addition to the simplicity of the operation.
- Although this operation will depend on the importation of high-quality basic material, this should not be a major issue, since such material is widely available in the international market. The DR has been operating blending plants for many years. In addition to the basic nutrient material, other materials required are:
 - Non-nutrient materials that serve as filler to adjust the blends and reach the required nutrient content according to the formulations.
 - Material to reduce or minimize caking.
 - 45- to 50-kg bags with plastic liner for packaging the blended product.
- Since these materials are to be mechanically blended, it is necessary that the particle size of each of the individual basic fertilizer materials be of uniform size granules, to facilitate blending and avoid separation (or granule segregation) after blending and bagging.
- Close proximity to a large population center to source and/or ensure qualified labor and professionals for the management and operation of the plant.
- Any fertilizer blending operation ideally must be located near the source of the basic material and the market. Perhaps the optimum location can be determined based on a transportation modeling analysis. The essential criteria for location include:
 - It should be strategically located near the product entry point (border crossing or sea port) since the blending plant will rely entirely on imported basic material. In both cases,

substantial investment may be necessary to make the process fluid. In border crossing, it may be necessary to reduce the crossing time and road improvements. In sea port, the improvement of wharfs and the unloading process of vessels may be required. Perhaps port expansion will be necessary to allow larger vessels to anchor at port in order to realize economies-of-scale in procurement and sea transportation.

- Near or accessible to a reliable source of electric energy. Due to the instability of the electric supplies in Haiti, should also include investment in a back-up electric generator system. This will avoid long interruptions in the production process, especially during the critical production times, which coincide with peak demands during the main two production seasons.
 - Although the blending process does not require water, it is important to ensure a source of water for personal use and any other technical or sanitary needs.
 - Close proximity and accessibility to the main agricultural production areas or, more importantly, to the most consuming agricultural areas to minimize transportation costs and facilitate consistent supply. This criterion assumes the existence of highways or main access roads to those areas.
- Another relevant technical consideration from the agricultural production perspective is the need to produce blended fertilizer according to the specific needs of the soils and crops being planted in Haiti, rather than adapting formulations that may not be suitable for the Haitian conditions – and consequently, an excessive or unnecessary application of some nutrients while severely lacking others.

Economics and Financial Considerations

- One consideration is the size of the Haitian fertilizer market, mainly related to quantity demanded and market price at the plant gate. Prices are defined by the supply and demand of fertilizer in the market. On the supply-side, the level of efficiency, and therefore the cost of production in the plant, and the level of domestic market competition will contribute to defining the market price. On the demand-side, the technological advances at the farm level, and the quantity demanded, will also help define the market price. Therefore, it is also necessary to invest in other measures that will help increase demand and facilitate the supply of fertilizer in the market.

- The benefit of the blending plant in Haiti is expected to be negligible, especially considering that the major recurring cost of operating the plant estimated at 80 percent or higher, is for the imported basic fertilizer raw material to be blended. This factor is in part due to the volatility of the fertilizer international market. Consequently, the in-country value added could be relatively small, between 10 and 20 percent of the total annual operations cost.
- In terms of finance, a source for investment funds and for operation of the plant is another important consideration. The amount of initial fixed capital investment will depend on the level of automation selected for the plant, which will also define efficiency of production and, consequently, the profit margin at the plant gate. Since this assessment does not involve a financial analysis, it is difficult to determine the financial feasibility of establishing a fertilizer blending plant in Haiti.
- In either case, the initial investment of fixed capital, which depreciates over time, typically has little effect on the overall production cost of the blended product and, therefore, on the financial feasibility of the plant. This is because the cost of the imported basic material used as inputs in the blending process, can represent as much as 80 percent or more of the plant operating cost, depending on the volatility of the international fertilizer market.
- The criterion of particle size uniformity of the basic fertilizer material for blending can make such material more expensive.

There are other economic and non-economic advantages, with political implications, that must be taken into consideration:

- The importance of developing a local industry that will create jobs. Given the high level of unemployment in Haiti, it would be expected that the mechanization level would be relatively low for the investment to be a source of job creation. Although additional investment would have to be made in training and equipment, which will guarantee, to a certain extent, or increase the level of safety for employees operating the main equipment. Therefore, it is presumed that investing in establishing a domestic blending and bagging plant in Haiti will help increase the use of other local resources (i.e., labor).
- An expected improvement in the consistent flow of the proper fertilizer products according to the crops and soil needs, and potential price stability.
- Stimulate competition among the current market players at the import and distribution levels.

- Ensure availability of a wider range of fertilizer products according to specific crops and climatic and soil conditions.
- Restore credibility of the industry through providing the market with the products when needed, at the right time, place and price.

Potential Disadvantages

- Considering the market size of Haiti, the project may not be either financially or economically feasible depending on the assumptions taken into consideration in a detailed economic and financial analysis.
- Also, considering that Haiti had blending plant operations that no longer exist, the project may not be feasible, at least under the current market conditions, and without considering any government protection in terms of lifting competition barriers from internal and external competitors.
- In order to potentially be feasible, the plant will need to be operated with high efficiency to keep a low production cost and increase the possibilities to make higher profit. However, profit will also depend on the prevailing market prices, which at the same time are functions of the level of competition in the market. This is more difficult in an open and competitive market with already established companies.
- Another factor that will help keep production costs low is the basic material cost. It will be necessary to envision an optimum procurement and transportation process to decrease the landed cost of the basic material, which is expected to be slightly higher considering the physical quality requirements for the blending process.

Recommendations

Based on the Haiti fertilizer market assessment and considering the size of the market, currently it may not be feasible to establish a fertilizer blending operation in Haiti. As the quantity of fertilizer consumed in Haiti increases, it is recommended to look into the economic and financial feasibility for establishing a blending plant in-country. For this endeavor, initially, a PPP should be promoted to allow the private sector to utilize, at the minimum, public storage infrastructure and perhaps contribute to the initial capital investment. Eventually it is recommended that the operation should be a wholly private sector operation after proper

government divestiture. The Ministry of Finance should consider allowing a tax holiday for a period of five or more years to encourage private sector investment in the blending plant.

To realize the objectives of establishing a new blending plant in Haiti, and in light of the competition already facing this type of business, the implementation of the recommendations for the development of an open fertilizer market in Haiti still apply.

A Few Words on Organic Fertilizer Production

In Haiti, there is potential for the use of organic fertilizer. However, it is necessary to first identify sources and make large investments to collect all types of biomass and process them in order to concentrate the nutrients and make them available as organic fertilizer. If this industry were to rely on agricultural residues, the sector would need to produce enough biomass residues as waste material (in addition to the main produce). For this, it is necessary for the soil to already have enough nutrients, bringing one back to the question of the current state of nutrient availability in the soil.

Given the depleted conditions of soils in Haiti and since farmers typically do not make use of fertilizer, they do not produce enough biomass – and whatever is produced is extracted from the soil for other uses. Therefore, to produce enough biomass waste material in addition to farmer's produce, there is a strong need to make use of inorganic fertilizer, at levels that support maximum economic yields and soil fertility restoration. For highly degraded soils, this will require higher than the traditionally recommended levels of inorganic fertilizer.

VIII. Annex 3 The Fertilizers Act, 2009

THE FERTILIZERS ACT, 2009

ARRANGEMENT OF SECTIONS

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PRELIMINARY PROVISIONS

Section *Title*

1. Short title and commencement.
2. Interpretation.

PART II
ADMINISTRATION

3. Establishment and functions of the Tanzania Fertilizer Regulatory Authority.
4. Functions of the Authority.
5. Establishment, powers and duties of the Board.
6. Composition, functions and procedures of the Board.
7. Appointment of the Executive Director.

PART III
REGISTRATION AND ISSUANCE OF LICENCES

(a) Registration of fertilizer sterilizing plant

8. Registration of fertilizers and sterilizing plants.
9. Application for registration.
10. Cancellation and suspension of registration.
11. Procedure for cancellation or suspension of registration.
12. Availability, lapse and return of certificate of registration.

(b) Licensing of fertilizer dealers

13. Restriction for dealing with fertilizer and sterilizing plant.
14. Suspension and cancellation of licences.
15. Maintenance of register.
16. Licences not transferable.
17. Replacement of lost licences.

PART IV**MANUFACTURING, IMPORTATION AND TRADING IN FERTILIZER OR FERTILIZER
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18. Registration of premises.
19. Sale of fertilizer or fertilizer supplements.
20. Manufacture and sale of fertilizers containing certain substances.
21. Importation of fertilizer and fertilizer supplements.
22. Director to keep records.
23. Use of local materials for fertilizer manufacturing.
24. Fertilizer dealers to keep records.
25. Permit for importation and exportation of fertilizer and fertilizer supplements.
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28. Prohibition for dealing with unregistered and substandard fertilizer.
29. Packaging and labeling.
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33. Appointment of Inspectors and Analysts.
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SCHEDULE

THE UNITED REPUBLIC OF TANZANIA



NO. 9 OF 2009

I ASSENT,

A handwritten signature in black ink, appearing to read 'Jakaya Kikwete', written over a horizontal dotted line.

President

12 May 2009

An Act to make provisions for regulation of manufacturing, importation, exportation, sale and utilization of agricultural fertilizers, to repeal the Fertilizers and Animal Food stuffs Act, Cap. 378 and to provide for other related matters.

ENACTED by Parliament of the United Republic of Tanzania.

PART I

PRELIMINARY PROVISIONS

1. This Act may be cited as the Fertilizers Act, 2009 and shall come into operation on such date as the Minister may, by notice published in the Gazette, appoint.

Short
title and
com-
mence-
ment

2. In this Act, unless the context otherwise requires—
“advertisement” includes any statement, picture, design or device—

Interpre-
tation

- (i) published in any newspaper or other publication in general circulation to the public; or
- (ii) contained in any publication or any other matter in any form which is distributed to members of the public through the public or brought to the public in any other manner;

- “Analyst” means a person appointed or designated as an Analyst pursuant to section 33;
- “Appeals Board” means an Appeal Board referred to under section 36(3);
- “Authority” means Tanzania Fertilizer Regulatory Authority as established under section 3;
- “brand” means a representation of kind, any distinctive mark or trade name, other than a name or grade required by this Act, applied by the fertilizer dealer to a fertilizer or fertilizer supplement to distinguish it from any other fertilizer or fertilizer supplement;
- “Board” means the Board of the Authority as established under section 5;
- “bulk fertilizer” means a fertilizer or fertilizer supplement distributed in large quantity in non packaged form;
- “Director” means the Executive Director of the Tanzania Fertilizer Regulatory Authority appointed under section 7;
- “discharge” means emission or exposure of fertilizer or fertilizer supplement into environment;
- “distribute” means import, export, consign, manufacture, blend, sale, offer for sale, and any other form of exchange or supply of fertilizer or fertilizer supplements;
- “environment” includes the physical factors of the surroundings of human beings, including air, land, water, climate, sound, light, odour, taste, micro-organism, the biological factors of animals and plants, cultural resources and the social economic factor of aesthetics and includes both the natural and the built environment and the way they interact;
- “fertilizer” means any substance or mixture of substances, containing one or more of nitrogen, phosphorus, potassium or other elements represented for use as a source of plant nutrients;
- “fertilizer business” means a business dealing in import, export, manufacture, blending, distribute or sale of fertilizer , or fertilizer supplements;
- “fertilizer dealer” means any person operating a business that is engaged in the manufacturing, handling, storage, importation, exportation, distribution or sale of fertilizer or fertilizer supplements;
- “fertilizer supplement” means any substance or mixture of substances, other than a fertilizer, that is manufactured, sold or represented for use in the improvement of the physical condition of soils or to aid plant growth or crop yields;

- “grade” means available plant nutrient contents in the fertilizer expressed in terms of percentage;
- “guaranteed analysis” means the minimum percentage of plant nutrients in a fertilizer or fertilizer supplements;
- “Inspector” means a person appointed or designated as an Inspector pursuant to section 33;
- “label” includes any legend, description, mark, symbol or design applied or attached to, included in, belonging to or accompanying any fertilizer or fertilizer supplement or package;
- “labelling” means any written, printed, or graphic matter accompanying any fertilizer or fertilizer supplements, or advertisements, brochure or poster;
- “manufacture” means operations involved in the production, preparation, processing, compounding, formulating, filling, transformation, packaging, re-packing and labelling of fertilizer or fertilizer supplements;
- “manufacturer” means a person who produces, prepares, processes, compounds, formulates, fills, transforms, packages, re-packs and labels a fertilizer or fertilizer supplements;
- “Minister” means the Minister responsible for agriculture;
- “premises” include any land, building or any part structure, vehicle, basement and vessel, or receptacle whatsoever for the purpose of manufacturing, selling, transporting or in any way connected with the handling or storage of fertilizer or fertilizer supplements;
- “package” includes a sack, bag, or any other container in which fertilizer or fertilizer supplements is placed or packed;
- “sell” includes agree to sell, or to offer, advertise, keep, expose, transmit, convey, deliver or manufacture for sale or to exchange or to dispose of to any person in any manner for any consideration whatever, or to transmit, convey or deliver in pursuance sale, exchange or disposal as aforesaid; and 'sale' has a corresponding meaning;
- “sample” means a representative amount of fertilizer or fertilizer supplements drawn randomly for analysis;
- “sterilizing plant” means a plant used for sterilizing of bones or other substances derived from cattle, members of the horse family, sheep, goats, pigs, poultry or ostriches, of any age, or from any vertebrate or invertebrate specified by the Minister from time to time by notice in the Gazette;
- “standard” means conditions governing specification, safety, description, sampling, testing method, code of practice or any other quality aspect relating to or connected with fertilizer manufacturing or marketing or

any component, raw material, machinery, instrument, apparatus or other thing whatever used, directly or indirectly in the manufacturing or marketing of fertilizer supplements as may be recognized under the Standards Act;

“sub-standard fertilizer” means any fertilizer which does not conform to the standard provided for under in this Act;

“tampered package” means a package whose quality, quantity and content has been altered ;

“tampered sample” means a sample of fertilizer or fertilizer supplement which has been changed, altered, varied or destroyed with an intention to defraud, cheat or misrepresent the truth.

PART II ADMINISTRATION

Establishment and functions of the Tanzania Fertilizer Regulatory Authority

3.-(1) There is established an authority to be known as the Tanzania Fertilizer Regulatory Authority or in its acronym "TFRA".

(2) The Authority established under subsection (1) shall be a body corporate and shall-

- (a) have capacity to sue and be sued on its own name;
- (b) have perpetual succession and a common seal which shall be authenticated by the signature of the Director or in his absence any person acting on his behalf authorized by him in writing;
- (c) be capable of entering into contracts in its own name; and
- (d) be capable of purchasing or acquiring any movable and immovable property.

Functions of the Authority

4.-(1) The Authority shall be the regulatory body in the fertilizers industry and shall in particular -

- (a) regulate all matters relating to quality of fertilizers, fertilizer supplements and sterilizing plants;
- (b) register all fertilizer and fertilizer supplements dealers and their premises;
- (c) license fertilizer dealers;
- (d) issue permits for importation and exportation of fertilizer and fertilizers supplements;
- (e) maintain a register of fertilizers, fertilizer supplements and sterilizing plants;
- (f) maintain and publish periodically a register of fertilizer dealers;

- (g) implement ratified international conventions relating to fertilizers;
- (h) regulate and control the import, production, transportation, dealing, storage, and disposal of fertilizer or fertilizer supplements;
- (i) collect, maintain and publish information related to fertilizers and fertilizer supplement;
- (j) make guidelines on the sound management and effective control of fertilizers and fertilizer supplements;
- (k) in collaboration with Local Authorities, conduct public educational campaigns on the sound application and management of fertilizers and fertilizer supplements;
- (l) conduct regular training of stakeholders on fertilizer matters;
- (m) register inspectors and analysts;
- (n) inspect or cause to be inspected fertilizer or fertilizer supplements for quality assurance;
- (o) implement policies, strategies and programmes relating to fertilizer industry development;
- (p) provide technical advice to the government and other institutions on all matters relating to the fertilizer and fertilizer supplements management and control;
- (q) conduct or cause to be conducted research relating to fertilizers and fertilizer supplements;
- (r) foster co-operation between the institute and other institutions or organizations and stakeholders;
- (s) collaborate with the national and international organizations on all matters relating to the fertilizer and fertilizer supplement;
- (t) implement specific and general directives of the Authority;
- (u) regulate fertilizer price based on the appropriate methods as shall be set out in the regulations;
- (v) carry out any other functions as may be conferred upon it in the performance of its functions under this Act; and
- (w) ensure that it adheres with the Environmental Management Act.

Cap.191

(2) The Authority shall not engage directly or indirectly in any trade or business connected with the production, processing, importation, sale or distribution of any fertilizer or fertilizer supplement.

Establishment, powers and duties of the Board

5.—(1) There is established a Board of the Authority in which powers to carry out functions and management of the business and affairs of the Authority shall be vested.

(2) In particular and without prejudice to the generality of subsection (1), the Board shall have power to-

- (a) administer the properties of the Authority, both movable and immovable;
- (b) administer the funds and other assets of the Authority;
- (c) signify the acts of the Authority by use of the official seal;
- (d) on behalf of the Authority to receive, fees, donations, grant or other moneys;
- (e) advise the Minister-
 - (i) on all matters relating to fertilizers;
 - (ii) on implementation and amendment of the fertilizer legislation;
 - (iii) on approved types of fertilizers or fertilizer supplements;
- (f) give general advice on co-ordination, registration and regulation the fertilizer industry;
- (g) make recommendation to the Minister on the types of fertilizers to be used in accordance with appropriate soil properties;
- (h) formulate policy guidelines relating to the fertilizer industry and advise the government on appropriate policies and legal environment which promote local industries engaged in fertilizer manufacturing;
- (i) advise the Authority on licences to be issued under this Act;
- (j) authenticate the acts of the Authority by use of the official seal;
- (k) subject to the provisions of relevant public service legislation, to appoint any officers of the Agency whom the Board may consider necessary; and
- (l) do all acts and things as may be provided for in this Act or as may, in the opinion of the Board, be necessary or expedient for the proper discharge of the functions of the Authority.

Composition, functions and procedures of the Board

6.—(1) The composition, functions and procedures of the Board shall be as set out in the Schedule.

(2) For the proper discharge of its functions under this Act, the Board shall establish a Technical Committee consisting of such number

of competent persons in fertilizer matters as it may deem necessary.

(3) The Minister may, by Notice in the *Gazette* amend, vary or replace all or any provision of the Schedule.

7.-(1) There shall be the Executive Director of the Authority appointed by the President on the advice of the Minister from among persons who possess relevant qualifications and competence to manage efficiently and effectively the affairs of the Authority.

Appoint-
ment of
the
Executive
Director

(2) The Director shall be the head of the Authority and shall be responsible for-

- (a) the day to day operations of the Authority;
- (b) the proper management of its funds, property and business;
and
- (c) personnel management, development, organization, control and discipline of the employees of the Authority .

(3) The Director may delegate to any person some of the powers, duties and functions conferred or imposed upon him by this Act.

PART III

REGISTRATION AND ISSUANCE OF LICENCES

(a) Registration of fertilizer and sterilizing plant

8.-(1) Every fertilizer or fertilizer supplements or sterilizing plant shall be registered by the Director in accordance with the provisions of this Act.

Registra-
tion of
fertilizers
and
sterilizing
plants

(2) The Director shall, prior to registration of any fertilizer, fertilizer supplement or sterilizing plant, ensure that all required conditions for registration as set out in this Act are complied with.

9-(1) Any application for registration under this Act shall be submitted to the Director in the form and manner prescribed in the regulations.

Applica-
tion for
registra-
tion

(2) The Director may, after receiving an application for registration grant registration and issue registration certificate if he is satisfied that the required conditions are complied with.

(3) The Director shall-

- (a) establish and maintain a list of all registered fertilizers, fertilizer supplements and sterilizing plants; and
- (b) subject to the recommendation of the Board, publish the list of registered fertilizers, fertilizer supplements and sterilizing plants in the *Gazette* and any other journals or newspapers widely circulated in Tanzania.

(4) Any change of particulars of a registered fertilizer, fertilizer supplement or sterilizing plant shall be notified to the Director for re-registration.

(5) Any person who contravenes the provision of sub section (4) commits an offence and upon conviction shall be liable to a fine not less than one million or to imprisonment for a term of not less than six months or to both.

Cancellation and suspension of registration

10.-(1) The Director may cancel or suspend the registration of fertilizer or fertilizer supplement granted under this Act if he is satisfied that-

- (a) the registrant of such fertilizer or fertilizer supplements has contravened or failed to comply with the terms or conditions for registration as provided for in this Act;
- (b) such fertilizer or fertilizer supplements is not of the composition and efficacy specified in the application for registration pursuant to the conditions set out in the regulations, thereof, does not possess the chemical, physical and other properties so specified and does not comply with any requirements that may be prescribed;
- (c) the practices followed and facilities available at or in respect of the manufacturing plant are not suitable for the manufacturing of the fertilizer or fertilizer supplement concerned;
- (d) the person assigned or engaged to manage the business does not have sufficient knowledge of the relevant provisions of this Act or of the practices to be followed in the operation of such undertaking as specified in the regulations;
- (e) it is contrary to the public interest that such fertilizer or fertilizer supplement remain registered;

- (f) incorrect or misleading advertisement is used in connection with such fertilizer or fertilizer supplement.

(2) The Director may cancel the registration of sterilizing plant if he is satisfied that-

- (a) the registrant of such sterilizing plant has contravened or failed to comply with the terms or conditions for registration as provided for in this Act;
- (b) a person has contravened or failed to comply with the terms and conditions to which the registration concerned is subject;
- (c) the sterilizing plant does not comply with the prescribed conditions or is otherwise not effectively equipped for the sterilization of the substances referred to in the definition of sterilizing plant; and
- (d) it is contrary to the public interest that the sterilizing plant shall remain registered.

11.-(1) Prior to cancellation or suspension of any registration of fertilizer, fertilizer supplement or sterilizing plant under this Act, the Director shall require in writing the registrant to show cause within thirty days as to why the registration should not be cancelled.

Procedure for cancellation or suspension of registration

(2) Where the registrant under subsection (1) fails to reply within the period stated in the notice without good cause, the Director shall proceed to cancel or as the case may be to suspend the registration in respect of the registrant.

12.-(1) The person to whom a certificate of registration was issued in terms of section 9 shall produce or cause that certificate of registration or a copy thereof to be available for inspection by the Director or any authorized officer at all times at the establishment where fertilizer or fertilizer supplement is manufactured or sold.

Availability, lapse and return of certificate of registration

(2) The registration of any fertilizer, fertilizer supplement or sterilizing plant and the certificate of registration issued in respect of such registration shall lapse if-

- (a) the person to whom that certificate of registration has been issued, ceases to manufacture or sell the fertilizer or fertilizer supplement in question; or
- (b) the establishment in question is no longer used for the manufacture of such fertilizer or fertilizer supplement.

(3) Where the registration of any fertilizer or fertilizer supplement has lapsed in terms of subsection (2), or has been cancelled in terms of section 11, the certificate of registration in question shall, within the prescribed period, be returned to the Director by the person to whom it was issued.

(b) Licensing of fertilizer dealers

Restriction for dealing with fertilizer and sterilizing plant

13.-(1) A person shall not deal with fertilizer business or operation of sterilizing plant unless that person is licenced to that effect pursuant to the provisions of this Act.

(2) Any application for licence in terms of subsection (1) shall be submitted to the Board in the form and manner as may be prescribed in the regulations.

(3) Subject to sub-section (1), an application for licence shall contain among others-

- (a) the name and physical address of the applicant;
- (b) details of the intended business; and
- (c) qualifications of personnel under whose direct supervision the activities intended to be carried out.

(4) Upon being satisfied with the compliance with the conditions for application, the Board shall issue a licence to the applicant and may attach such terms and conditions as may be prescribed.

(5) The Board may appoint any person to be a licensing authority for the purposes of this Act and shall when making any appointment, specify the area for which that person is to be the licensing authority.

Suspension and cancellation of licences

14.-(1) A licence issued under section 13 may be suspended for a definite or indefinite period if the Director is satisfied that the licensee has-

- (a) been convicted of any offence against the provisions of this Act or regulations;
- (b) become bankrupt or, if a company, has gone into liquidation;
- (c) failed to comply with any conditions of the licence.

(2) Any licensee whose licence has been suspended or cancelled under this section, shall be required to surrender the licence to the Director within such time as may be prescribed.

(3) Any person who contravenes the provision of sub-section (2), commits an offence and upon conviction is liable to a fine not less than one million shillings or to imprisonment for a term of not less than six months or to both.

15. The Director shall maintain in the form prescribed in the regulations, a register of all licences issued under this Act and of any restorations, suspensions and cancellations of such licences.

Maintenance of register

16. A licence issued under section 13 shall be valid only in respect of the business for which it was issued and shall not be transferable to any other person or business.

Licences not transferable

17. Any holder of a licence issued under this Act whose licence has been lost or destroyed may, on proof of loss and payment of prescribed fee, obtain a duplicate licence from the Director.

Replacement of lost licences

PART IV

MANUFACTURING, IMPORTATION AND TRADING IN FERTILIZER OR FERTILIZER SUPPLEMENTS

18.—(1) A person shall not manufacture for sale, sell, supply or store any fertilizer or fertilizer supplement except in a sterilizing plant or premises registered under this Act for that purpose.

Registration of premises

(2) Every application for registration or renewal of registration of premises shall be made to the Director in the form and manner as may be prescribed in the regulations.

(3) The Director or any person on his behalf shall-

- (a) register the premises if he is satisfied that the prescribed requirements for which the premises is intended have been complied with;
- (b) keep registers in the prescribed form of all premises registered under this section; and
- (c) for good and sufficient reasons refuse to register, or cause to be deleted from the register, any premises which is or has

become unsuitable for the purposes for which it was registered.

(4) Any change of ownership of the business or any other change of a registered premises shall be notified to the Director.

(5) Any person who contravenes or fails to comply with this section, commits an offence and upon conviction shall be liable to a fine not less than one million or to imprisonment of the terms of not less than six months or to both.

Sale of
fertilizer
or
fertilizer
supple-
ments

19.—(1) A person shall not sell any fertilizer or fertilizer supplements unless-

- (a) it is registered under this Act under the name or mark under which it is so sold;
- (b) it is, subject to paragraph (c), packed in such manner and mass or volume as may be prescribed;
- (c) the container in which it is sold, complies with the prescribed requirements and is sealed and labeled or marked in such manner as may be prescribed or, if it is not sold in a container, it is accompanied by the invoice referred to in subsection (2); and
- (d) it is of the composition and efficacy specified in the application for registration thereof, possesses all chemical, physical and other properties so specified, and complies with the prescribed requirements.

(2) A person shall not for reward or in the course of any industry, trade or business use, or recommend the use of, any fertilizer or fertilizer supplement for a purpose or in a manner other than that specified on the label on a container thereof or described on such container.

(3) Any person who sells any fertilizer or fertilizer supplement not in a container shall give to the purchaser at the time of delivery or send to him at the time of dispatch an invoice setting forth such particulars in respect of such fertilizer or fertilizer supplement.

20.—(1) A person shall not manufacture or sell any fertilizer or fertilizer supplement containing bone or any other substance derived from an animal carcass, unless such bone or substance has-

- (a) been sterilized in such manner as may be prescribed; or
- (b) subject to the provisions of this Act, been imported in terms of a permit issued under the Animal Diseases Act.

Manufacture and sale of fertilizers containing certain substances
Cap. 156

(2) A person commits an offence against this Act, if that person-

- (a) manufactures for sale, sells, offers or exposes for sale, or has in his possession for sale, as a fertilizer or fertilizer supplement or any article containing or any other substance derived from an animal carcass which he knows or has reason to believe has neither been sterilised in a sterilising plant registered or licensed under the provisions of this Act nor imported into Mainland Tanzania in accordance with permit issued under this Act; or
- (b) sells, offers, or exposes for sale, otherwise than to the holder of a licence issued under this Act or his agent, any bone or other substance derived from an animal carcass, which he knows or has reason to believe will be used in the manufacture of a fertilizer or fertilizer supplement and has neither been sterilised in a sterilising plant registered or licensed under the provisions of this Act nor imported into Mainland Tanzania in accordance with this Act.

21.—(1) A person shall not import any fertilizer or fertilizer supplement in Tanzania unless-

- (a) such fertilizer or fertilizer supplements is registered in terms of this Act;
- (b) is of the composition and efficacy specified in the application for registration thereof;
- (c) possesses all chemical, physical and other properties so specified and complies with the requirements prescribed in respect thereof; and
- (d) is packed in a sealed container which is marked or labeled in the prescribed manner with the prescribed particulars;
- (e) in the case of a fertilizer or fertilizer supplements containing bone or any other substance derived from the carcass of an

Importation of fertilizer and fertilizer supplements

animal, a permit referred to in section 20 has been issued in respect thereof.

(2) Without prejudice to the provisions of subsection (1) and (2), the Minister may, upon consultation with the Board and on such conditions as he may determine, in writing, permit the import of any consignment of any fertilizer or fertilizer supplements which does not comply with the requirements referred to in subsection (1)(a), (b) and (d).

(3) Fertilizers or fertilizer supplements imported shall-

- (a) only be imported through a prescribed port or place;
- (b) if the Director directs that a sample thereof be taken, not be removed from any such port or place without the written consent of the Director;
- (c) if the Director thus directs, be made available for examination and the taking of a sample at any such port or place in the prescribed manner; and
- (d) where a sample thereof has thus been taken, not be sold in Tanzania except on the written consent of the Director and subject to the conditions specified therein.

(4) The provisions of section 32 relating to samples shall, *mutatis mutandis*, apply with reference to a sample taken in terms of this section.

(5) Where any fertilizer or fertilizer supplement has been imported contrary to the provisions of this section, such fertilizer or fertilizer supplement shall-

- (a) at the expense of such importer, be removed from Tanzania within such period as the Director may determine; or
- (b) if such importer fails to remove such fertilizer or fertilizer supplement in terms of paragraph (c), be forfeited to the Government, and be either destroyed or otherwise disposed of in the manner prescribed in the regulations.

Director to keep records

22. The Director shall keep records of all licenced or permitted fertilizer dealers in a manner prescribed in the regulations.

23.-(1) Any person who manufactures fertilizer or fertilizer supplement shall use locally available raw materials.

Use of local raw materials for fertilizer manufacturing

(2) Without prejudice to subsection (1), the Board may permit importation of raw material for manufacture of fertilizer or fertilizer supplements if such material is not available in Tanzania or by the available evidence to the Board that the material cannot be cheaply procured locally.

24. Every fertilizer dealer shall keep within his premises detailed records of fertilizer or fertilizer supplements manufactured, imported, exported, stored or sold as the case may be and such records shall be provided to the Director, Analyst, Inspector or any other officer assigned by the Director whenever requested.

Fertilizer dealers to keep records

25.-(1) A person shall not import or export fertilizer or fertilizer supplement unless he possesses permit issued by the Director to that effect.

Permit for importation and exportation of fertilizer and fertilizer supplements

(2) The Board shall, prior to issuing of any permit, satisfy itself that the provisions of the Environmental Management Act are adhered to, and that—

- (a) the fertilizer or fertilizer supplements to be imported or exported is registered under this Act;
- (b) the applicant has the certificates of registration for fertilizer business; and
- (c) in case of exportation, the applicant has complied with relevant legislation and policies dealing with fertilizer export.

26.-(1) The Director may suspend or cancel the permit issued under section 25 if he is satisfied that—

Cancellation of permit

- (a) the permit has been obtained by misrepresentation at the time of application;
 - (b) conditions subject to which a permit was issued have not been complied with;
 - (c) the permit has been transferred to any other person;
 - (d) the fertilizer dealer has contravened the provisions of this Act ;
 - (e) the business licence of the fertilizer dealer has been cancelled;
- or

(f) registration of such fertilizer or fertilizer supplement is cancelled.

(2) The Director shall, prior to cancellation of permit under this section, require in writing the holder of such permit to show cause as to why the permit should not be cancelled.

(3) Where the permit holder under subsection (2) fails to reply to the Director within the period as specified in the notice, the Director shall have power to proceed with cancellation of such permit without further notice.

Condi-
tions
for granting
licence or
permits

27. The Director shall, before granting permit in terms of section 25, ensure that the standards and conditions for dealing with fertilizer business as provided for in this Act and Regulations have been complied with.

Prohi-
bition for
dealing
with
unregistered
and substandard
fertilizer

28. A person shall not manufacture, import, export, sell, distribute any fertilizer or fertilizer supplements unless he is registered pursuant to this Act and conform to the standards prescribed in the regulations

Packag-
ing and
labeling

29. Any fertilizer dealer shall ensure that fertilizer or fertilizer supplements is packed and labeled in the manner prescribed in the regulations.

Adulter-
ated
fertilizer

30.— (1) A person shall not sell or distribute an adulterated or substandard fertilizer or fertilizer supplements.

(2) A fertilizer or fertilizer supplements shall be deemed to be adulterated if-

- (a) it contains any deleterious or harmful substance in an amount that renders injurious to plant life, animals, humans, aquatic life, soil, air, water or environment in general when applied in accordance with directions for use provided for in the Regulations;
- (b) adequate warning statements or directions for use which may be necessary to protect plant life, animals, humans, aquatic life, soil, air, water or environment in general are not shown on the label or shipping bills and certificate of analysis, as the case may be;

- (c) its composition falls below or differs from that which is purported to possess by its labeling or shipping bills and certificate of analysis as the case may be ; or
- (d) it contains foreign material other than fertilizer or fertilizer supplement.

(3) Any fertilizer whose standard does not conform to the requirement of this Act shall be seized and disposed of at the cost of the fertilizer dealer in accordance with procedures prescribed in the Regulations made under this Act or other written law.

31.-(1) A person shall not use, store, discharge, release, place or cause to be placed any fertilizer or fertilizer supplement in a manner likely to cause any adverse effect to human health or the environment.

Restriction on storage and application of fertilizer

(2) Any person who applies fertilizer or fertilizer supplements shall ensure compliance with the standards prescribed in the Regulations or guidelines.

PART V

FERTILIZER INSPECTION, SAMPLING AND ANALYSIS

32. The Director shall ensure fertilizer or fertilizer supplement is inspected, sampled and analyzed for quality control in accordance with the procedures prescribed in the regulations.

Fertilizer quality control

33.-(1) The Minister shall, by notice published in the *Gazette*, appoint or designate qualified persons to be of fertilizers Inspectors or Analysts who shall exercise powers in accordance with the provisions of this Act.

Appointment of Inspectors and Analysts

(2) Any person appointed or designated as Inspector or Analyst under sub-section (1) shall be given a certificate, identity card or a document as a proof of his appointment or designation which shall be produced in the exercise of his powers under this Act.

(3) Any Inspector or Analyst shall not engage in any business connected with the manufacturing, importation or sale of fertilizer or fertilizer supplements.

(4) The Minister may, in consultation with the Board and by order published in the Gazette, appoint any competent institution or individual to perform any fertilizer regulatory function specified under this Act and may in the same order define duties and powers of such institutions or individual.

(5) Any Inspector or Analyst appointed under subsection (1) shall be a designated officer accountable to the Director for the administration of this Act.

Powers of
Inspectors

34.—(1) An Inspector appointed under section 33 may, at any reasonable time—

- (a) enter upon and examine any place, premises, vessel or vehicle in respect of which he has reason to believe that on or in it there is manufactured, processed, prepared, graded, classified, packed, marked, labelled, held, bottled, removed, transported, exhibited, sold or used any fertilizer or fertilizer supplements;
- (b) examine or test any such fertilizer or fertilizer supplements or any ingredient thereof;
- (c) examine all books and documents on or in any place, premises or vehicle referred to in paragraph (a) in respect of which he has reasonable grounds for believing that they relate to any fertilizer or fertilizer supplements or any ingredient thereof, and make copies of or extracts from such books or documents;
- (d) examine any operations or processes carried out at any place or premises in connection with the manufacturing, processing, treatment, preparation, grading, classification, packing, marking, labeling, holding, bottling, removal, transport, exhibition, selling or use of any fertilizer or fertilizer supplements, and demand from the person in charge of such operations or processes, or the owner of or the person having the custody of any fertilizer or fertilizer supplements;
- (e) demand from the owner or any person having the custody of any book or document referred to in paragraph (c) an explanation relating to any record or entry therein;
- (f) seize any book, document, fertilizer or fertilizer supplements which may furnish proof of an offence in terms of this Act, or any quantity of any fertilizer or fertilizer supplements in respect of which there is reason to believe that any such offence has been committed, and remove from or leave on or in the place,

premises or vehicle in question, any book, document, fertilizer or fertilizer supplements, or any quantity thereof, which has so been seized, and may in his discretion place on such book, document, fertilizer or fertilizer supplements, or the container thereof, such identification mark or seal as he may deem necessary; and

- (g) take samples or cause samples to be taken of any fertilizer or fertilizer supplements or an ingredient thereof, and open any container which contains or is suspected to contain anything used or intended for use in the manufacture, processing, treatment, preparation, grading, classification, packing, marking, labeling, holding, bottling, removal, transport, exhibition or sale of any fertilizer or fertilizer supplements and examine, analyze, grade or classify such samples, or cause such samples to be examined, analyzed, graded or classified.

(2) The owner or person in charge of any premises described under this section and any person found therein shall give to an Inspector the reasonable assistance to enable the Inspector to carry out his duties and functions under this Act.

(3) Any Inspector may if he has reasonable grounds to believe that any of the provisions of this Act is violated, seize or issue a stop sale order by means of or in relation to which the violation was committed.

(4) Any fertilizer, fertilizer supplement or package seized pursuant to sub-section (3) shall be detained by an Inspector at any place by attaching a detention tag or mark in the manner prescribed in the regulations.

(5) Any person shall not move any fertilizer or package detained by the Inspector unless with a written consent of the Inspector indicating that the seized fertilizer, fertilizer supplements or package shall be placed in a safer or more convenient location.

(6) The fertilizer, fertilizer supplement or package under detention or stop sale order shall not be released unless the Inspector is satisfied that all conditions for release as provided for in this Act have been complied with.

(7) The Inspector shall, before inspection of the premises, take reasonable steps to ensure that the owner or his authorised representative is present while carrying out inspection under this Act.

Analysis and restriction for tempering with sample

35. An Analyst who receives a sample taken under the provisions of this Act shall as soon as is practicable analyze such sample, in accordance with the procedures for sampling and conducting analysis as may be specified in the regulations.

PART VI

APPEALS

Appeals against the decision of Inspector, Analyst or Director

36.-(1) Any person aggrieved by the decision of the Inspector, Analyst or Director regarding implementation of the provisions of this Act may, within thirty days upon receipt of such decision, appeal to the Minister.

(2) Every appeal made under this Act shall be in writing, stating the grounds under which it is made.

(3) The Minister shall refer the appeal filed in terms of sub-section (1) to the Appeals Board for consideration and determination.

Appointment of members of the Appeals Board

37.-(1) The Minister shall appoint members of the Appeals Board which shall be composed of the following-

- (a) one person designated as a Chairman on account of his knowledge of law; and
- (b) two persons who, in the opinion of the Minister, command sufficient knowledge regarding the matters which will probably be in issue when the appeal is considered.

(2) The Appeals Board may after hearing and considering the appeal-

- (a) confirm, set aside or vary the relevant decision of the Director;
- (b) order the Director to execute the decision of the Appeals Board in connection therewith.

(3) Procedures for appeals under this Act shall be as may be prescribed in the regulations.

(4) A member of the Appeals Board may be paid such allowances as the Minister may determine.

PART VII
FINANCIAL PROVISIONS

38. The funds and resources of the Authority shall consist of-
- (a) such sums of moneys as may be appropriated by the Parliament;
 - (b) any moneys raised by way of loans, grants made within and outside the United Republic;
 - (c) any moneys raised by way of fee or charges imposed under the provisions of this Act;
 - (d) any loan or subsidy granted to the Authority by the Government or any other person;
 - (e) such sums of money or property, which may become payable to or vested in the Authority under this Act or any other written law.

Funds and
resources
of the
Authority

39.-(1) The Authority shall cause to be kept and maintained in accordance with the International Accounting Standards, proper books of accounts with respect to-

Accounts
and audit

- (a) all sums of moneys received and expended;
- (b) all the assets and liabilities of the Authority; and
- (c) all the income and expenditure statement of the Authority.

(2) Within six months of the close of every financial year, the accounts including the balance sheet of the Authority shall be audited by the Controller and Auditor General in accordance with the provisions of the Public Audit Act.

Act
No. 11
of 2008

(3) Every audited balance sheet shall be placed before a meeting of the Board of and, if adopted, it shall be endorsed with a certificate to that effect.

(4) As soon as the accounts of the Authority have been audited, and in any case not later than six months after the close of the financial year, the Board shall submit to the Minister a copy of the audited statement of accounts together with a copy of the report on that statement made by the auditors.

(5) The Minister shall, as soon as practicable after receiving the report, lay before the National Assembly the audited accounts of the Authority together with the auditor's report, if any, on the accounts.

PART VIII
GENERAL OFFENCES AND PENALTIES

Offences
and
penalties

- 40.-(1) Any person who-
- (a) deals in with unregistered fertilizer or fertilizer supplement;
 - (b) deals with fertilizer or fertilizer supplement without being so registered;
 - (c) obstruct the Director, Inspector, Analysts or any officer responsible for the enforcement of this Act;
 - (d) operates a sterilizing plant which is not registered under this Act;
 - (e) willfully delays or obstruct, threatens, or assaults an Inspector or Analyst to perform his duties under this Act;
 - (f) willfully refuses to provide any information required by the Inspector, Analyst or any other official engaged in carrying out the duties and functions under this Act and the regulations made thereto;
 - (g) sells any fertilizer or fertilizer supplement upon the container of which a false or misleading statement in connection with such contents is printed or written;
 - (h) makes any false or misleading statement in connection with any fertilizer or fertilizer supplement;
 - (i) willfully destructs or tempers with any information required for proper administration of this Act or regulations made thereto;
 - (j) fails to comply with an order issued under this Act;
 - (k) tampers with any sample taken in terms of this Act, or with anything seized in terms of this Act;
 - (l) sells any fertilizer or fertilizer supplements which is not of the kind, nature, composition, strength, potency or quality described or represented when so sold;
 - (m) having been duly summoned to appear before the Board, fails without lawful excuse so to appear;

- (n) having appeared as a witness before the Board, refuses without lawful excuse to be sworn or to make affirmation or to produce any document or answer any question which he may be lawfully required to produce or answer;
 - (o) not being qualified as Inspector or Analyst purports to act in that behalf; or
 - (p) makes use, in connection with any fertilizer or fertilizer supplement, of any certificate, invoice or other document issued in respect of any other fertilizer or fertilizer supplement which is no longer valid,
- commits an offence.

(2) Any person who commits an offence against the provisions of this Act or of any subsidiary legislation made under this Act shall, except as otherwise provided, be liable on conviction to a fine not less than five million shillings and not more than ten million shillings or to imprisonment for a term of not less than six months and not exceeding three years or to both.

(3) The court may in addition to any penalty imposed under this Act, order any article in respect of which such offence is committed or used for the commission of such offence to be forfeited.

41. Where an offence is committed and due to that commission a person has suffered a direct damage or loss of his property, the court may, in addition to the penalty provided under this Act, order the offender to compensate the person who suffered loss or damage.

Compensation for damage.

42.—(1) Any act which if done by an individual would be an offence against this Act or any regulations or orders made under this Act shall, if done by a body corporate, be an offence by a Director and Secretary thereof unless he proves that the offence was committed without his consent or connivance and that he exercised all such diligence to prevent the commission of the offence as he ought to have been exercised having regard to the nature of his functions in that capacity and to all circumstances.

Offences by body corporate or firm

(2) Where an offence against this Act or any regulations or orders made under this Act has been committed by a partner in a firm, any person who at the time of the commission of the offence was a partner

in that firm, or was purporting to act in that capacity, shall be deemed to have committed that offence, unless he proves that the offence was committed without his consent or connivance and he exercised all such diligence to prevent the commission of the offence as he ought to have exercised having regard to the nature of his functions in that capacity and to all the circumstances.

Evidence
and
procedure

43.-(1) Any document purporting to be a report under the hand of an Analyst appointed under the provisions of this Act, may be admitted in evidence in any civil or criminal proceedings concerned with the article sampled and shall be sufficient evidence of the facts stated therein unless the defendant or person charged requires that the Analyst be called as a witness.

(2) Any sample which has been taken in the prescribed manner by an Inspector or Analyst shall, unless the contrary is proved, be deemed to be of the same composition, some qualities, and except in so far as the taking of the sample may cause it to be otherwise, possess in all other respects the same properties as the whole from which it was drawn.

(3) In any criminal proceedings under this Act-

- (a) any quantity of a fertilizer or fertilizer supplement in or upon any premises, place, vessel or vehicle at the time a sample thereof is taken pursuant to the provisions of this Act shall, unless the contrary be proved, be deemed to be of the same composition to same degree of efficacy and possess in all other respects the same properties as that sample;
- (b) any person who is proved to have tampered with any sample shall be deemed to have acted with fraudulent intent unless the contrary is proved;
- (c) a certificate stating the result of an analysis or test carried out in pursuance of the provisions of this Act and purported to be signed by the analyst who carried out such analysis or test shall be accepted as prima facie proof of the facts stated therein;
- (d) any statement or entry contained in any book or document kept by any manufacturer, importer or owner of a fertilizer or fertilizer supplements, or by the manager, agent or employee of such person, or found upon or in any premises occupied

by, or any vehicle used in the business of such person, shall be admissible in evidence against him as an admission of the facts set forth in that statement or entry, unless it is proved that that statement or entry was not made by such person, or by any manager, agent or employee of such person in the course of his work as manager, or in the course of his agency or employment.

44. In any proceedings for an offence under this Act, the burden to prove that the order, direction or requirement, the contravention of which constitutes the offence with which the accused is charged, shall not lie on the accused, and in the case of an order, direction or requirement not published in the *Gazette*, that he had no notice of the contents of the order, direction, as the case may be required, shall lie on the accused person.

Burden of proof

PART IX MISCELLANEOUS PROVISIONS

45. Without prejudice to the provisions of Section 28A of the Penal Code, no matter done by any person exercising or purporting to exercise any function under this Act or under any subsidiary legislation made under this Act shall, if done in good faith in the execution or purported execution of his functions under any of the provisions of this Act or such subsidiary legislation, subject any such person as aforesaid to any action, liability, claim or demand whatsoever.

Indemnity
Cap. 16

46. The provisions of this Act shall not apply to a sale, offer or exposure for sale, where a bailiff, court broker or other officer in the course of executing any order or process of a court makes such sale.

Exempted sales

47. If any person, by failing to comply with this Act or acting contrary to this Act or subsidiary legislation made under this Act, causes an Inspector or Analyst to incur an expense that would not otherwise have been incurred, that person shall pay to the Government of the United Republic the full amount of that expense reasonably incurred, and that amount shall be recoverable from him as a debt due to the Government.

Recoverable costs

48. Any removal, reshipment or destruction of any fertilizer, fertilizer supplement, package or article to which this Act applies, shall be carried out at the expenses of the owner, occupier or any person entrusted with

Expenses for destruction of fertilizers and fertilizer supplements

the charge of the premises where such fertilizer, fertilizer supplement, package or article is found.

Notifica-
tion of
order
and
directions

49. Where any order or direction made or given by the Minister, or the Director under this Act is not required to be published in the Gazette, the order or direction shall be brought to the notice of persons affected or likely to be affected thereby in a manner determined by the Minister.

Exemp-
tion

50. Notwithstanding of section 8 the Minister may, after consultation with the Board and by Order published in the Gazette prescribe types of fertilizer or fertilizer supplements which may be exempted from requirements of this Act or Regulations made under this Act.

Power to
make
Regula-
tions

51.— (1) The Minister shall, at the appropriate time, make regulations for the better carrying into effect of the provisions of this Act.

(2) Without prejudice to the generality of sub-section (1) the Minister may make regulations—

- (a) prescribing the manner in which fertilizers, fertilizer supplements, or sterilizing plants may be registered, the manner in which any such registration may be renewed and the information to be furnished and the fees to be paid with any application for registration and renewal of registration;
- (b) prescribing the processes by which fertilizers, fertilizer supplement, or substances used in the manufacture of fertilizers or fertilizer supplements shall be sterilized, and the manner of inspection of sterilizing plants;
- (c) prescribing the requirements with which any establishment shall comply, the practices which shall be followed in the operation of any undertaking at any establishment, the facilities which shall be available at any establishment, and the records to be kept and the information to be furnished in respect of any establishment and the operation of any undertaking at any establishment;
- (d) prescribing the records to be kept and the returns to be rendered in respect of registered premises and sterilizing plants;
- (e) for preventing the adulteration of fertilizers or fertilizer supplements or the tampering with containers thereof;

- (f) prescribing the methods to be employed, the fees to be paid, and the certificates to be issued in respect of the examination, analysis or test of samples taken under this Act;
- (g) regulating the manner in which fertilizers or fertilizer supplements intended for sale may be handled and stored;
- (h) regulating the manner in which fertilizers or fertilizer supplements intended for sale shall be packed, labeled, branded, marked and sealed;
- (i) prescribing the limits within which any fertilizer or fertilizer supplement may be deficient in any of its ingredients and the proportion in which any preservative, antiseptic or other constituent may be present therein;
- (j) regulating the equipment and appliances to be used in the licensed sterilizing plant and their mode of operation;
- (k) prescribing the manner in which samples may be taken and dealt with;
- (l) prescribing the method by which analysis is to be carried out by Analysts under the provisions of this Act;
- (m) for preventing the use of false or misleading statements in advertisements of fertilizers or fertilizer supplements;
- (n) prescribing minimum qualification and any additional duties of Inspectors and Analysts;
- (o) respecting the detention of anything seized or placed under stop sale under the provisions of this Act and for the preservation or safeguarding anything so detained;
- (p) prescribing the particulars to be set forth in any invoice to be furnished under this Act;
- (q) requiring any person who has in his possession or under his control any fertilizer and fertilizer supplement to keep records relating thereto in the form and manner prescribed, and to render returns in the form and manner and at the times prescribed;
- (r) prescribing the composition, efficacy, chemical, physical or other property required in respect of any substance in order that it may be imported, sold or registered as a fertilizer or fertilizer supplement;
- (s) prescribing procedures for appeal under this Act;
- (t) respecting the disposition of anything forfeited to the government under this Act;

- (u) prescribing Forms to be used for any application under this Act ;
- (v) the procedures for testing fertilizers and fertilizer supplement;
- (w) prescribing anything which is by this Act required or authorized to be prescribed.

Transi-
tional
provision

52. Any fertilizer dealer shall, within twelve months after coming into force of this Act, apply to the Director for the registration of the fertilizer or fertilizer supplements manufactured, ordered, imported, sold or stored.

Repeal
Cap. 378

53. The Fertilizers and Animal Foodstuffs Act is repealed.

SCHEDULE

[Made under Section 6(1)]

COMPOSITION AND PROCEDURES OF THE BOARD

Composi-
tion of the
Board

1. -(1) The Board shall consist of the Chairperson to be appointed by the President and ten other members to be appointed by the Minister as follows -

- (a) a representative from the directorate responsible for fertilizer development in the Ministry;
- (b) a representative from the directorate responsible for land use management in the Ministry;
- (c) one representative from association of fertilizer dealers to be appointed by the Minister on recommendation from respective association;
- (d) two representatives from farmers association or co-operative societies be appointed by the Minister on recommendation from respective association;
- (e) a representative from the national institute responsible for standards;
- (f) a representative from the national institute responsible for environmental matters;
- (g) a representative from national institute responsible for radiation;
- (h) a representative from higher learning institution dealing with soil science and production;
- (i) a representative from the national institution responsible for research on soil fertility.

(2) The Director shall be the Secretary to the Board.

(3) All meeting of the Board shall be chaired by the Chairperson, on his absence, the members shall choose from its members a chairperson for meeting.

(4) The Board may co-opt any other person to attend its meeting as deemed appropriate for the purposes of rendering technical advise and such co-opted person shall have no right to vote.

2. A member of the Board other than an *ex-officio* member shall hold an office for a period not exceeding three years or for such shorter periods as may be specified in his instrument of appointment.

Tenure
of office
of members
of the
Board

3.-(1) At least half of the members of the Board shall constitute a quorum at any meeting and all decisions to be arrived at by the meeting of the Board shall be decided by a simple majority of the members present.

Members
Quorum

(2) Each member of the Board shall have one vote and in the event of equal votes, the Chairperson of the meeting shall have a second or casting vote in addition to his deliberative vote.

4. Minutes in proper form of each meeting of the Board shall be properly kept and confirmed by the Board at its next sitting and signed by the Chairperson of the meeting.

Minutes of
Board's
meetings

5. The Board shall have power to regulate its own procedures in respect of meetings and proper conduct of its business.

Procedures

6. The Board shall cause to be recorded and kept minutes of all business conducted or transacted at its meetings, and the minutes of each meeting of the Board shall be read and confirmed, or amended, at the next meeting of the Board and signed by the Chairperson and Secretary.

Minutes
of the
meetings

7. Members of the Board shall be paid such allowances as may be approved by the Minister responsible for Finance from time to time.

Allowances
of the
members

Passed in the National Assembly on the 23rd April, 2009.



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Clerk of the National Assembly

IX. List of Contacted People

Name	Position	Institution/Organization	Telephone Number	Email
Michelet Fontaine	Director, Haiti	Chemonics, D.C.	+202-955-7460	mfontaine@chemonics.com
Jean Robert Estime	Director, WINNER Program	Chemonics Haiti	+509-3758-2640	jestime@winner.ht jestime@chemonics.com
Phillip Palmer	Coordinator FTF/Food Security Initiative	USAID Haiti	+ 509 2229-8703	ppalmer@usaid.gov
James Wooly	Sr. Agronomist, Economic Growth	USAID Haiti	+509 2229-8317	jwooly@usaid.gov
Greta Greathouse	Chief of Project	USAID/HIFIVE*	+509-2511-9983	ggreathouse@hifive.org.ht
Jacques Alix	FSP Coordinator	MARNRD*	+509-2249-7190	jacquesalix@yahoo.fr
Jean M. Robert Chery	Consultant/Advisor FSP	MARNRD	+509-3454-6426	jmrchery@hotmail.com chery04@yahoo.fr
Giles Damais	Sr. Specialist Natural Res & Env.	BID*	+509-2812-5000	gillesd@idb.org
Bruno Jacquet	Rural Dev. Sr. Associate	BID	+509-2812-5031	brunoj@idb.org
Aloys Nizigiyimana	Seed Production Program Manager	FAO	+509-2941-0311	AloysNizigiyimana@fao.org
Philippe C.L. Yen	Counselor	Chinese Republic (Taiwan) Embassy	+509-3759-9834	clyen@mofa.gov.tw
Shui-Sung Hsiang	Chief	Taiwanese Technical Mission to Haiti	+509-2813-1356	s.s.hsiang@icdf.org.tw tm.haiti@icdf.org.tw
M. Rachelle Pier Louis	Project Specialist	IICA	+509-2940-2451	rachelle.chery@iica.int
Sylvain Dufour	Credit Specialist/Counselor	Desjardins Development International.	+509-4714-4265	sdufour@did.qc.ca
Jean Roosevelt Juliotte	Project Director	Micro Credit National/UNIBANK	+509-2813-0667	jrjuliotte@mcn.ht
Clifford Lerebours	Agricultural Finance Advisor	Le Levier Micro Finance	509-3564-6503	clifford.lerebours@lelevier.ht cleflerebours@yahoo.fr
Ena Menager Derenocourt	President and General Director	Societe d'Exportation de Fruits et Legumes	509-3720-7848	Enam.derenocourt@agrotechnique.com
Cristel C. Paul	Project Development Manager	Bigio Group	509-3170-2021	cpaul@gbgroup.net
Cote Reinbold	President	Reinbold Export Imports		cotereinbold@yahoo.co.uk
John Currely	Consultant/Fertilizer Specialist	Expert Consultant	509-2942-1460 or 509-3291-5375	jcurrely@gmail.com

HIFIVE: Haiti Integrated Finance for Value Chain and Enterprises; BID/IDB: Inter-American Development Bank; MARNRD: Ministry of Ag. Nat. Resources and Rural Dev.; IICA: Inter-American Institute for Cooperation on Agriculture.

X. Haiti Visits and Meetings Schedule

Haiti Visits and Meetings Schedule				
May 2012				
Mon	Tue	Wed	Thu	Fri
28	29	30	31	
		p.m. arrival to PaP, Haiti	Met with WINNER personnel and discussed TOR and visit schedule	
June 2012				
				1
				p.m. Visited with the coordinator of the Haitian Gov Coord. of the Fertilizer Subsidy Program
4	5	6	7	8
Worked on reviewing documents and partial writing of report	a.m. visit FAO a.m. visit with Raimbul	a.m. BID 3:00 pm Le Levier financier	Haiti holiday. Work on writing partial report	a.m. Jean Robert Chery, MoA minister advisor 3:00 Briefing with WINNER director
11	12	13	14	15
p.m. Visited UNIBANK	a.m. Visit IICA (finance program insurance prog) a.m. Visited Grupo Bigio p.m. traveled to Artibonite	Artibonite: Visit farmers and agro-input stores Return to PaP Thursday p.m.		a.m. Visit the Taiwan mission
18	19	20	21	22
Worked on reviewing documents and partial writing of report	Preparation for preliminary presentation of findings and recommendations to stakeholders	Preparation for preliminary presentation of findings and recommendations to stakeholders	Presentation to WINNER personnel and different stakeholders on the fertilizer supply, NGO and donors	Visited farmers and agro-input stores in Kenscoff