



# The Business Case for Investing in the Import and Distribution of Fertilizer in Rwanda

*May 2012*



## **Disclaimer**

This document was prepared by Monitor Group for the Rwanda Ministry of Agriculture and Livestock under the auspices of the USAID's Feed the Future (FtF) program. Its findings are based on public and proprietary information, as well as information gathered by Monitor Group through field investigation and qualitative interviews with industry experts and other key stakeholders.

Monitor Group does not make any representation or warranty, express or implied, as to the accuracy, completeness, or correctness of the information contained herein, nor does it accept any liability for any loss or damage, howsoever caused, arising from any errors, omissions, or reliance on any information or views contained in this document. Monitor Group is not a financial advisor; therefore, this document does not represent financial advice.

# Table of Contents

<b>1. Executive Summary .....</b>	<b>5</b>
<b>2. The Market Opportunity .....</b>	<b>8</b>
2.1 Fertilizer Market Overview .....	8
2.2 Competitive Landscape .....	10
2.3 Overview of Privatization .....	12
2.4 Post-Privatization Competitive Landscape .....	14
2.5 Post-Privatization Market Potential for Fertilizers.....	14
2.6 Enabling Environment.....	16
2.7 Long-term Potential Market Developments .....	16
<b>3. Investment Highlights .....</b>	<b>18</b>
3.1 Opportunity Definition.....	18
3.2 Opportunity Specific Attraction .....	18
3.3 Operating Model .....	18
3.4 Key Financials and Capital Requirements .....	20
3.5 Projected Returns.....	22
3.6 Key Risks and Mitigation Steps.....	22
<b>4. Financial Projections and Assumptions .....</b>	<b>25</b>
4.1 Financial Forecasting Model.....	25
4.2 Assumptions.....	25
<b>5. Enabling Requirements .....</b>	<b>34</b>
5.1 Access to Credit .....	34
5.2 Increasing End Market Linkages .....	35
5.3 Smallholder Farmer Development.....	35
5.4 Infrastructure .....	35
<b>6. Development Benefits.....</b>	<b>36</b>
<b>7. Way Forward .....</b>	<b>37</b>
7.1 Target Investor Profiles.....	37
7.2 Next Steps.....	37

## Table of Figures

Figure 1: Fertilizer Imports (000s MT) .....	8
Figure 2: Agriculture Landscape and Fertilizer Usage.....	9
Figure 3: Growth Potential in Usage .....	10
Figure 4: Projected Competitive Landscape Post Privatization .....	14
Figure 5: Fertilizer Market Potential (volume MT) .....	15
Figure 6: Forecast Income Statement Assuming a 100% Equity-Funded Investment ('000 USD).....	21
Figure 7: Forecast Cash Flow Statement ('000 USD) .....	21
Figure 8: Projected Returns .....	22
Figure 9: Sensitivity Analysis .....	23
Figure 10: Fertilizer Volumes – Cash Crops (MT).....	26
Figure 11: Fertilizer Volumes – Staple Crops (MT).....	27
Figure 12: Export Market Sales (Excluding Aggregators).....	27
Figure 13: Aggregator Market Sales.....	27
Figure 14: Product Prices (USD/MT) .....	28
Figure 15: Tender Market Sales .....	28
Figure 16: Private Market Sales .....	28
Figure 17: Product Prices (USD/MT) .....	28
Figure 18: Cost of Goods Sold (USD/MT).....	29
Figure 19: Cost of Warehousing per Annum (USD/MT).....	30
Figure 20: Selling Costs per Annum (USD/MT) .....	30
Figure 21: General and Admin Costs (USD per annum).....	32
Figure 22: Working Capital Requirements .....	32
Figure 23: Tax Treatments .....	32
Figure 24: Opportunity Cost of Capital .....	33
Figure 25: Credit-Guarantee Bank Loan Structure in Kenya.....	34
Figure 26: Expected Improvements to Out-Grower Incomes – Economics for a sample Coffee Farmer.....	36

# 1. Executive Summary

## *The Market Opportunity*

Increasing fertilizer usage is an integral part of the Government of Rwanda's strategy to increase agricultural productivity – a critical component of the nation's "Vision 2020" economic development plan. As a result, the Government has extensively committed its time and resources to develop the fertilizer market and support fertilizer utilization in Rwanda. The Government's interventions have resulted in a significant increase in nationwide fertilizer usage, from a meager 6,000 metric tons in 2006 to 34,000 metric tons in 2012. This growth represents an annual increase of 32% and a market valued at \$33 million in 2012. During this same period, penetration rate (number of farmers using fertilizers) has increased from 14 to 29%.

Fertilizer use in Rwanda is limited to six crops. Within staples, fertilizers are used for maize and wheat given government's priority to promote these crops for food security, and for rice and Irish potatoes as these are popular food crops with established domestic demand. Within cash crops, fertilizer is used in tea and coffee, as they have established export markets. Other crops have weak linkages to end markets (limited incentive to invest in yield increases) and hence have low fertilizer usage.

The competitive landscape for fertilizer is currently restricted to fertilizer importers, distributors and retailers as there is no domestic production of fertilizer in Rwanda. Currently, the Government serves as the primary fertilizer importer and distributor. However, the Government is ready to privatize the fertilizer market and is currently developing a roadmap for this process. The Government's interest in privatization is being driven by four factors: (1) The size of Rwanda's fertilizer market is now more attractive to the private sector; (2) private sector involvement would lead to operational efficiencies (lower capital, delivery, and storage costs) and lower the cost to Rwanda's smallholder farmers; (3) private players will offer a more diverse range of products suited to Rwanda's soil needs, which will increase technical agriculture capabilities through utilization (4) the Government can play a more effective role in developing programs to increase awareness and credit for farmers in partnership with private sector players and donors than it can as a importer and distributor.

In conjunction with USAID and the International Fertilizer Development Center (IFDC), the Government has created the PReFER program, which is tasked with creating a strategy and schedule for privatization, to be released in Summer 2012. Preliminary plans highlight the need for a three phased approach, with market privatization staggered over five years by crops and geographic area. The phased approach will allow the Government to implement key enabling requirements for successful privatization, including better access to finance and credit recovery for farmers, infrastructure improvements, the development of quality control and extension services to increase farmer knowledge and usage.

The stable growth in fertilizer demand is dependent on these initiatives being successfully implemented. For the sake of this investment case, it has been assumed that the Government and donors will implement the planned initiatives needed to mitigate these risks. However, given the extent of these assumptions and the complexity of privatization in any country or sector, it has also been assumed that only 50% of the fertilizer market will be privatized by 2019. The extra two years added to the Government's estimated timeline and the reduced assumed level of privatization help ensure the opportunity is not overstated and increase the comfort around the underlying market opportunity. With these assumptions in place, the fertilizer market in Rwanda is projected to grow at 5% per annum, with a potential total market size of 48,000 MT by 2019.

## ***Investment Highlights***

The investment opportunity identified is the establishment of a fertilizer import and distribution business with potential annual sales of 14,000 MT to agro-retailers in the cash and staple crop market in Rwanda, with potential expansion into adjacent countries (DRC and Burundi). Revenues of \$15 million can be realized in Rwanda's market valued at \$50-60 million by 2019.

This investment opportunity identified requires an investor to enter the current market before privatization occurs to ensure capture a substantial market share. The investor should start with the distribution and sales of fertilizer for export crops (tea and coffee), where the Government does not subsidize fertilizer and private sector players can be competitive, and for staple crops bid for the Ministry of Agriculture (MINAGRI) tenders. After privatization, an investor will be able to participate in the private market for staple crops and cash crops across the board. A private player who can effectively manage this opportunity will be able to realize a market share of 30%, in line with the market leaders in neighboring markets such as Kenya and Tanzania.

## ***Financial Projections and Assumptions***

The annual revenue forecast of \$15 million by 2019 requires an overall investment of \$1.2 million. The investment is required for financing working capital and covers the initial operating loss which is driven by investment in activation programs including model farms, extension services, distributor incentives, and all other marketing costs.

The business case assumes 100% equity financing and is projected to deliver an IRR of 39%. Operationally, the fertilizer company will achieve cash breakeven by 2016 (and free cash flows are positive from year 4). The business case estimates the 2019 EBITDA margin to be 10% which is conservative when compared to regional fertilizer companies.

## ***Enabling Requirements***

Several key risks could arise and require mitigation in order for this investment to be successful. For example, a delay in or a collapse of privatization implementation would significantly decrease the attractiveness of this opportunity. Successful mitigation will require an investor to accelerate and enhance its ability to serve the cash crop market by building partnerships with top-of-the-chain players, such as Starbucks in Coffee, food processors like Minimex, ICM, to aggregate farmers and subsequently demand for fertilizer. Additional risks include limited donor / Government support for financing extension services and model farms, higher working capital costs, slow or limited consumer adoption, and price volatility due to the price of oil and foreign exchange (FX) risks.

The Government of Rwanda and several donor organizations are already considering or implementing initiatives to help mitigate these risks. The Government and donors understand that a drop in fertilizer demand would decrease yields and directly detract from agricultural productivity goals. As a result, they have undertaken efforts to increase access to credit through its rural financial schemes, by incentivizing the financial services sector, promoting aggregator models, and developing agro-dealer credit facility; create stronger end markets; enhance farmer awareness and agro-technical capabilities; and, reduce transport costs to ensure that demand does not drop and that the agriculture sector is further developed by this investment.

## ***Development Impact***

Allowing private companies to purchase, import, and distribute fertilizer will greatly free up cash flows that the Government can use for other activities designed to develop and support the fertilizer market in Rwanda outlined above.

With more than 80% of Rwanda's population engaged in agriculture, an increase in the fertilizer penetration rate, currently less than 30%, can have a significant impact on farmer incomes and food security. This investment can help bolster Rwanda's food security in two ways: (1) by increasing the yield, and therefore the income, of smallholder farmers, and (2) by improving the sophistication of these farmers' farming practices. For example, correct fertilizer usage is expected to increase yields of a coffee farmer by approximately 20%, leading to a 22.5% increase in farmer profits. Additionally, armed with better access to (and knowledge of) credit and co-ops, and increased training in planting and harvesting best practices, smallholder farmers will be able to improve their purchasing choices and timing, which will have a positive impact not only on their immediate revenues but also on their long-term income sustainability.

Given the potential social impact of increased fertilizer usage (and increase in yields), investors should project this to the Government and donors to maintain support required to successfully build this business in Rwanda.

## ***Conclusion***

The profile of this investment is appealing to a large fertilizer trader or producer that is looking to increase volumes in the East African Community, build scale, and/or increase their supply chain reach. In order to be successful, the ideal investor should already be familiar with the East African market, be currently or shortly involved in the fertilizer market, and be interested in an investment with a long-term horizon. Furthermore, investors with a robust supply chain and a history of success in servicing the export market as well as participating in tender markets will be more likely to gain Government trust and support.

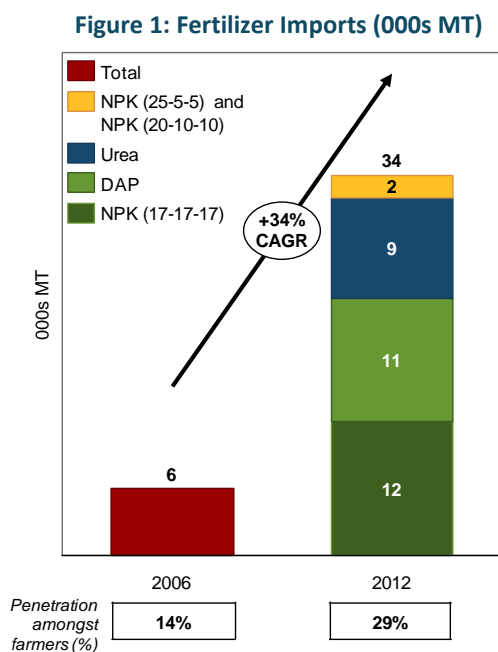
To successfully execute this investment, prospective investors will need to build relationships with public and donor stakeholders. Establishing key relationships with IFDC, MINAGRI, NAEB, and USAID, among others, will help foster investors' understanding of the fertilizer privatization schedule, increase their access to distributors, and drive farmer engagement via extension services and model farms. Investors will also need to work with regional transportation companies in order to reduce transportation costs and retailers to build distribution channels. Investors will also need to implement their own due diligence process focused on product soil requirements and farmers' needs and willingness to pay for fertilizer and their adoption rates of new products. This upfront effort during the initial stages of privatization will well position to capture market share as the privatization process unfolds.

## 2. The Market Opportunity

### 2.1 Fertilizer Market Overview

Increasing fertilizer usage is an integral part of the Government of Rwanda’s strategy to increase agricultural productivity – a critical component of the nation’s “Vision 2020” economic development plan. As a result, the Government has extensively committed its time and resources to develop the fertilizer market and support fertilizer utilization in Rwanda. In 2007, the Government launched the Crop Intensification Program, which subsidizes fertilizer for staple crops, such as maize, wheat, rice, potatoes. To complement the subsidies, the Government has also initiated efforts to educate farmers on the use and benefits of fertilizer and developed a network of fertilizer distributors and agro-retailers throughout the country to ensure fertilizer reaches the farm gate. These efforts are funded as a part of Rwanda’s commitment to the Comprehensive Africa Agriculture Development Program (CAADP), under which participating African governments pledge to increase their investment in agriculture by a minimum of 10 percent of their national budgets. Rwanda was CAADP’s first signatory and remains deeply committed to the agricultural productivity goals this program represents.

The Government of Rwanda’s interventions have resulted in a significant increase in nationwide fertilizer usage, from a meager 6,000 metric tons in 2006 to 32,200 metric tons in 2012. This growth represents an annual increase of 32% and a market valued at \$31 million in 2012. During this same period, penetration rates among farmers increased from 14% to 29%. Farmers have learned to understand and use a variety of fertilizers in this time period — DAP, NPK (17-17-17), and Urea for staple crops and NPK (25-5-5) and NPK (20-10-10), for cash crops. Most importantly, the increased use of fertilizer has significantly improved crop yields. Based on growth and utilization rates to date, the market size for fertilizer by is projected to further increase by 5% per year, even without further government intervention.<sup>1</sup>



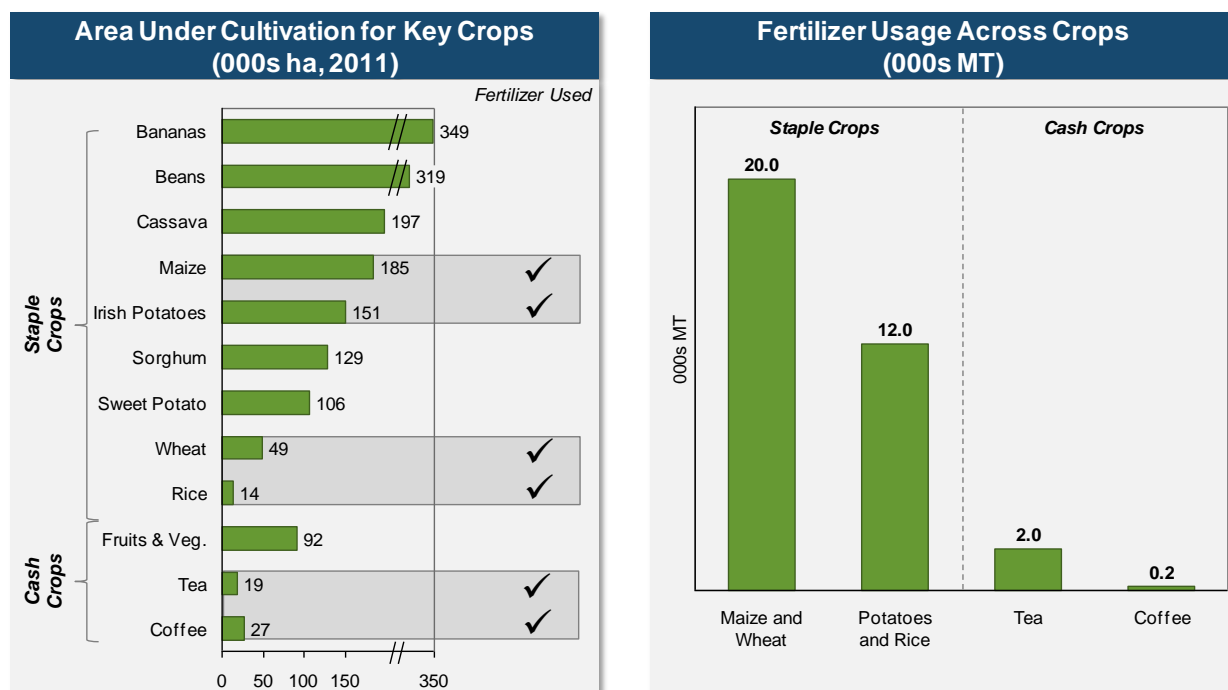
<sup>1</sup> This estimate assumes no new interventions by Government or donors and that the market is not privatized. Based on interviews with IFDC and data from MINAGRI.



To secure additional growth with increasing privatization (and potential reduction in subsidies), the fertilizer sales volumes need to be closely monitored to prevent any drop in demand. Government will need to make sure that fertilizer policies are clearly implemented and evaluated for their impact. For example, fertilizer demand among coffee growers decreased from an estimated 2,000 metric tons to 200 metric tons after the Government withdrew its policy to extend credit to farmers by giving fertilizer upfront and then subtracting payment from crop revenues. The change in policy without the support of better access to credit resulted in the drastic reduction in demand. This experience has strengthened the Government’s understanding of how to craft, sequence and implement fertilizer market development initiatives.

Similarly, the Government has also learned that increasing agricultural productivity will only be successful if there are developed end markets to absorb the increased yields. For example, there have been instances in the cultivation of maize where farmers use too little fertilizer or divert the fertilizer to other crops like rice, potato, because end market demand for maize is weak.<sup>2</sup> As a result, the Government is committed to developing strong market linkages for these crops, recently forming the Rwanda Grain Cereal Corporation, a private-public partnership that will procure produce from farmers and sell it to processors and other end markets, such as regional markets and the World Food Program. While the Cooperation will need to ensure it does not distort prices by buying grain at higher than market price and then selling at a lower price, it can play a helpful role in stimulating demand for maize and encouraging the proper application of fertilizer. The successful absorption of increased yields in rice and potatoes by a large domestic market, have demonstrated to the Government the impact that strong end markets can have on encouraging increased agricultural productivity.<sup>3</sup>

**Figure 2: Agriculture Landscape and Fertilizer Usage**



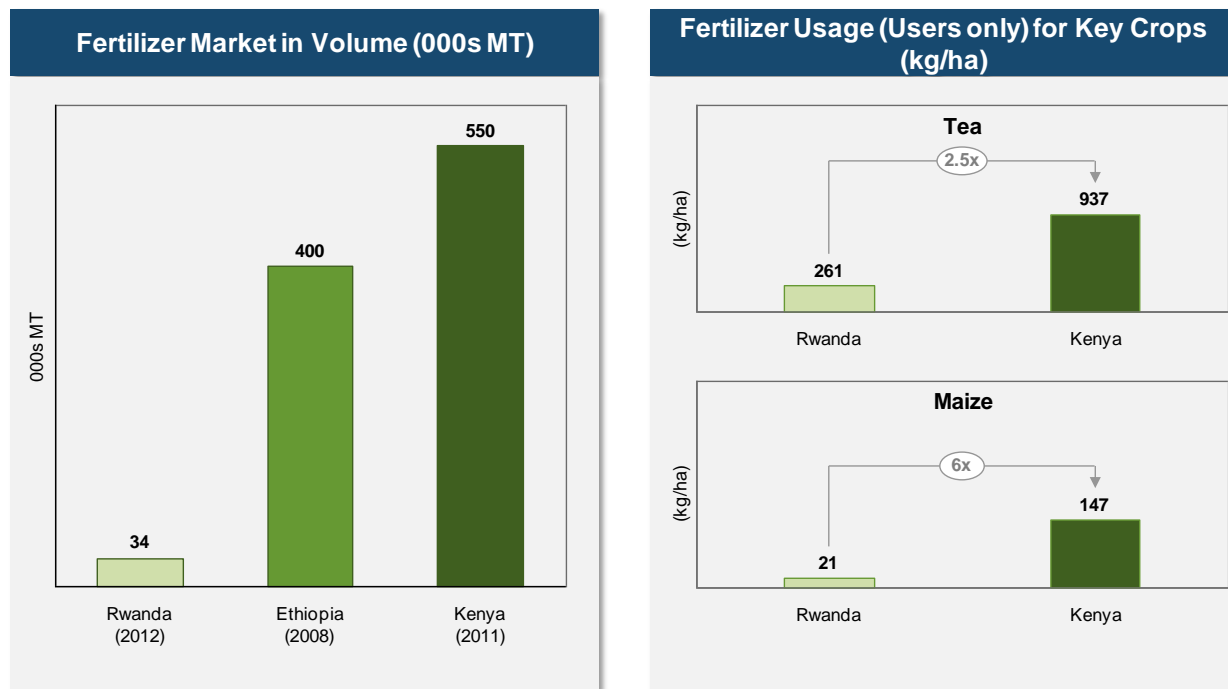
Source: MINAGRI Crop Assessment 2011, IFDC, EICV III, Fertilizer Types, Availability, and Consumption in Kenya, Mathenge 2009

<sup>2</sup> Multiple maize and wheat processing firms.

<sup>3</sup> Farmer, processor, and MINAGRI interviews.

Learning from these experiences will help both the Government and investors more effectively capitalize on the ways the market can be grown further. Currently low utilization rates across crops and farmers create significant potential for growth in fertilizers volumes. Achieving the utilization rates in regional countries in staple crops will increase fertilizer usage 2.5 to 6 times for tea and maize accordingly.

**Figure 3: Growth Potential in Usage**



## 2.2 Competitive Landscape

The competitive landscape for fertilizer is currently restricted to fertilizer importers, distributors and retailers as there is no domestic production of fertilizer in Rwanda. Currently, the Government serves as the primary fertilizer importer and distributor. However, the Government is ready to privatize the market and is developing a roadmap for this process. The impending privatization of the fertilizer market makes the timing of an investment in this market especially interesting; investors that enter the market now — and develop the operational capacity and market understanding required of such an investment — will be well positioned to secure first-mover advantage as the privatization of Rwanda's fertilizer market unfolds.

Given the extent to which privatization will alter the competitive landscape for this opportunity, both the current and post-privatization competitive landscapes are described below.

### 2.2.1 Current Competitive Landscape

Because the Government is the primary importer and distributor of fertilizer in Rwanda, private players in the fertilizer market primarily supply staple crop fertilizers to the MINAGRI tenders and cash crop fertilizers to NAEB tenders. A few fertilizer companies still supply cash crop fertilizers directly to end users, but private players prefer to supply NAEB rather than compete against it, as the marginal benefits

of directly supplying to end users are slim. However, there are low barriers to entry for Government tenders; new entrants who price competitively can quickly gain market share.

Meanwhile, the private market for fertilizer distribution is very small, <5% of the overall market. Because Government subsidies do not cover imports by private companies, the price of privately supplied fertilizers is much higher than Government-imported and subsidized fertilizer. Some companies which tried directly supplying to the cash crop fertilizer market have not seen profits because of the small market size and have scaled back operations. As a result, this opportunity assumes a business that would serve both markets to achieve the economies of scale needed.

### 2.2.2 Buyers

The primary fertilizer buyers in Rwanda are MINAGRI, which imports fertilizer for staple crops, and NAEB, which imports fertilizers for cash crops. Farmers and co-ops buy fertilizers from agro-retailers supplied by MINAGRI and NAEB and can also purchase fertilizer from private companies directly. All of these buyers purchase fertilizer from regional and international companies.

- MINAGRI is the largest buyer in Rwanda, accounting for more than 90% of the market. Currently, MINAGRI's annual imports comprise approximately 8,000 metric tons of Urea; 10,000 metric tons of DAP; and 12,000 metric tons of NPK (17-17-17) — at a total value of more than \$28 million.<sup>4</sup> Annual Government tenders allow private players to participate in the bid process; however, because of the subsidies offered on these fertilizers, private players cannot compete with MINAGRI. The subsidies provided by the Government include (1) a transportation and import tax subsidy amounting to approximately \$155 per metric ton for all imported fertilizers, and (2) a 50% subsidy for wheat and maize producers to purchase DAP and Urea.<sup>5</sup>
- NAEB is the second-largest fertilizer buyer in Rwanda, buying and distributing close to \$2 million of fertilizer annually: 2,000 metric tons of NPK (25-5-5) for tea crops and 200 metric tons of NPK (20-10-10) for coffee crops.<sup>6</sup> The fertilizer imported by NAEB is not subsidized; hence there is a fair marketplace for private competition. Private players can remain cost competitive depending on their economies of scale and their marketing efforts.
- Farmers and co-ops are the smallest group of direct buyers of fertilizer from foreign companies, purchasing an estimated 40 to 100 metric tons of fertilizer per year.<sup>7</sup> The total size of this market is small, roughly less than \$100,000. Because Government subsidies discourage farmers involved in staple crops from paying high premiums for private or specialized fertilizer, the market mainly comprises farmers and co-ops involved in cash crop production who can pay only a small premium to private players for more specialized fertilizer.

### 2.2.3 Suppliers

The vast majority of companies currently active in the fertilizer market in Rwanda can be divided into three categories:

- **Traders** are companies that do not produce fertilizer but rather distribute fertilizer from producers across the world. Some trading firms give farmers free or subsidized inputs in exchange for purchasing the crops produced (either for free or at a reduced rate). The biggest

<sup>4</sup> MINAGRI tender for 2012, IFDC estimates.

<sup>5</sup> Investor and stakeholder interviews; IFDC; MINAGRI.

<sup>6</sup> Regulatory changes in payment for fertilizer have decreased demand in coffee from 2,000 metric tons to 200 metric tons over the last three years.

<sup>7</sup> Estimated range given from investor, co-op, and IFDC interviews.

trader in Rwanda is Export Trading Group, which has won more than 50% of total MINAGRI tenders in recent years.

- **Regional fertilizer companies** either produce or blend fertilizer in sub-Saharan Africa. Platinum and MEA Kenya are two examples of regional fertilizer companies that have won Rwandan Government tender bids before.
- **International fertilizer companies** either produce or blend fertilizer outside of sub-Saharan Africa. Large international firms such as Yara, actively participate in MINAGRI tenders and private distributorship.

Currently, ETG Kenya and new entrant Yara International are the only established fertilizer companies in Rwanda. The initial competition in the private market for fertilizers post-privatization is likely to be low, leaving ample room for new investors.

### **2.3 Overview of Privatization**

The Government of Rwanda's privatization plan is designed to increase market efficiencies and increase uptake to accelerate agricultural productivity across crops and throughout Rwanda. The Government will regulate and help develop the market through market enabling initiatives, while private companies will import and distribute fertilizers. The Government's preliminary plan outlines a phased approach to privatizing the market over a period of five years, 2013 to 2017.

#### **2.3.1 Rationale for Privatization**

The Government of Rwanda seeks to privatize the fertilizer market for four reasons:

- **The size of the market is now attractive to private sector players.** Thanks to the Government's extensive efforts to promote fertilizer usage, the fertilizer market in Rwanda is now attractive to private sector players. Interviews with international and regional fertilizer suppliers and distributors confirmed that current adoption levels in Rwanda and the extent of the untapped opportunity make the market an attractive extension market for business operating in the EAC.
- **The Government sees several operational efficiencies to be gained by private sector involvement in the market.** For example, there has been a lack of consistent alignment between the tender process, fertilizer distribution, and the crop season, as well as occasional delays in printing vouchers and supplying fertilizers. This is largely because the market has been driven by Government processes and not by market dynamics. The Government realizes it needs to exit from the supply and distribution aspects of the market to make way for private sector players whose business demands will more naturally address these market inefficiencies.
- **The private sector will offer a more diverse range of products that will require an increase in SHF agro-technical capabilities.** Governments procured fertilizers are currently mass-produced commodities. Private sector players will be more likely to introduce fertilizers more suited to Rwanda's soil and crop needs because they will want to demonstrate the value and impact of their products to consumers to encourage uptake. New products will include premium fertilizer as well as fertilizers modified specifically for Rwandan conditions
- **The Government believes it can play a more effective role in improving the enabling conditions for fertilizer uptake.** In 2012, the Government of Rwanda spent close to \$32 million upfront to purchase and store fertilizer, and took on the risk of repayment itself. Allowing private companies to purchase, import, and store fertilizer will greatly free up cash flows that the Government can use for other activities designed to develop and support the fertilizer market in Rwanda. These include educating smallholder farmers on the benefits of fertilizer and

how to apply it, supporting soil testing to identify the type and amount of fertilizer needed, creating better access to credit and credit recovery, and supporting the development of end markets.

Furthermore, the Government has received support from both the private sector players who have expressed real interest in this opportunity and donors who are committed to supporting the strategy development and implementation process.

### 2.3.2 Roadmap to Privatization

The preliminary five year plan (2013-2017) detailed below, is currently undergoing the government's review.<sup>8</sup> At present, the plan outlines a three-phase approach that will focus on building the market conditions and human capital required for successful privatization.

- The **first phase** will focus on strengthening the market for privatization. It will include initiatives designed to increase credit recovery and access to finance; improve voucher distribution and redemption; strengthen agro-retailers; develop a registration system for both distributors and agro-dealers; and build platforms for dialogue with investors and private sector players at the beginning of the privatization process.
- The **second phase** will focus on decentralizing and introducing competition into the fertilizer market. It will include initiatives designed to phase out Government auctions and introduce a mixture of fixed and market prices for fertilizer; relax regional quotas and allow distributors to compete for market shares while retaining incentives for servicing remote areas; establish and operate a market information and transparency system; continue to strengthen distributors and agro-dealer associations; and improve rural infrastructure.
- The **third phase** will focus on liberalizing imports. It will include initiatives designed to remove transport subsidies; invite regional suppliers to supply in bulk in Kigali and regional centers; allow private sector players to import fertilizers as a group; and arrange risk sharing and capital support for imports. Once these initiatives are in place, the Government will gradually reduce farm-level subsidies but continue to monitor the impact of subsidy removal on fertilizer uptake.

At the end of these three phases, the Government expects to be fully removed from the supply of fertilizer — and for the private sector to be fully engaged in the importing and marketing of fertilizers. The Government expects this effort to require extensive private-public sector partnership for the market to be fully developed. Private players who are able to service the tender market and the private export market will help bolster the Government's confidence in the ability and commitment of the private sector to service Rwanda's fertilizer market and ensure a timely privatization schedule.

### 2.3.3 Implications of Privatization Plans for the Business Case

Given the multiple enabling requirements which still need to be successfully implemented, there are risks of reduced and volatile demand as a result of privatization. For the sake of this investment case, it has been assumed that the Government and donors will implement the planned initiatives needed to mitigate these risks. However, given the uncertainty and complexity of privatization in any country or sector, it has also been assumed that only 50% of the fertilizer market will be privatized by 2019. The extra two years added to the Government's estimated timeline and the reduced assumed level of privatization help ensure the opportunity is not overstated and increase the comfort around the

---

<sup>8</sup> Preliminary Roadmap for Fertilizer Privatization (IFDC, MINAGRI).

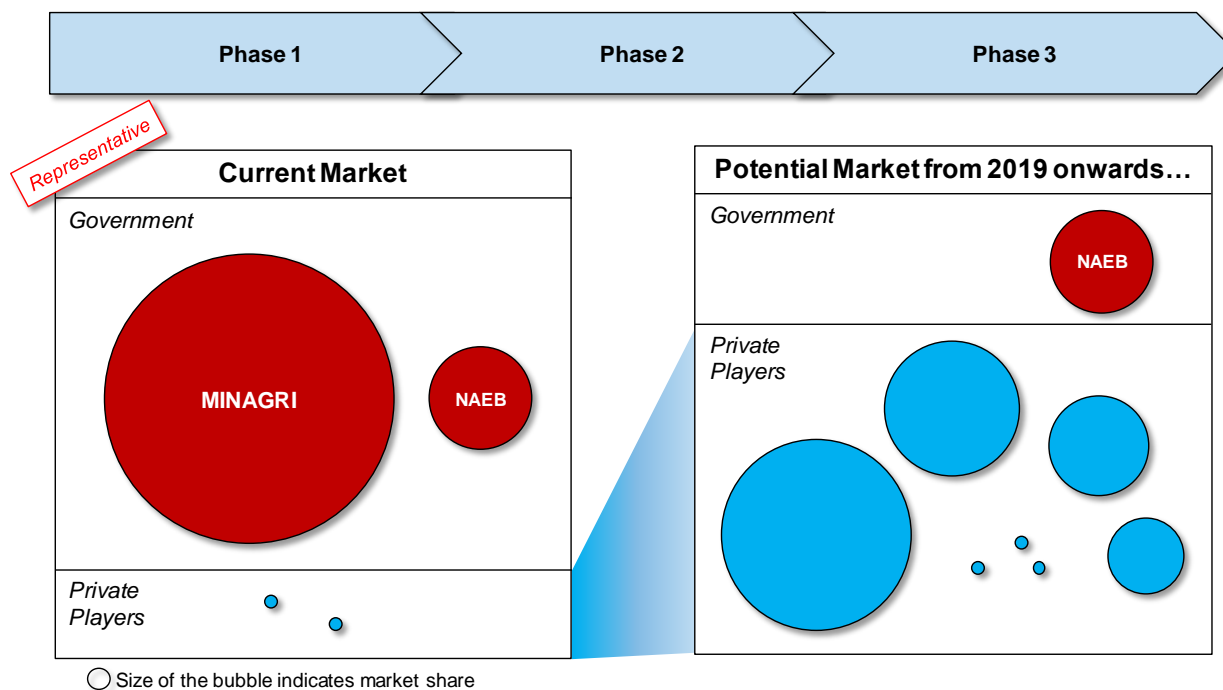
underlying market opportunity. With these assumptions in place, the fertilizer market in Rwanda is projected to grow at 5% per annum, with a potential total market size of 48,000 MT by 2019.

## 2.4 Post-Privatization Competitive Landscape

In order to be competitive, this opportunity considers that the business will service both the cash crop and staple crop private fertilizer markets, as well as bid for the tender market that may exist throughout the privatization process. The tender market would become less competitive as more of the market privatizes and total demand from MINAGRI decreases.

The current suppliers of fertilizer to Government tenders will most likely be the main candidates for investing in its sale and distribution in the privatized market. The businesses that participate in supply and distribution will remain primarily trading firms, regional producers / distributors, and international producers / distributors. Some players, most likely trading companies, will remain solely suppliers and will not enter into the distribution market, despite the higher profit margins associated with distribution.

Figure 4: Projected Competitive Landscape Post Privatization



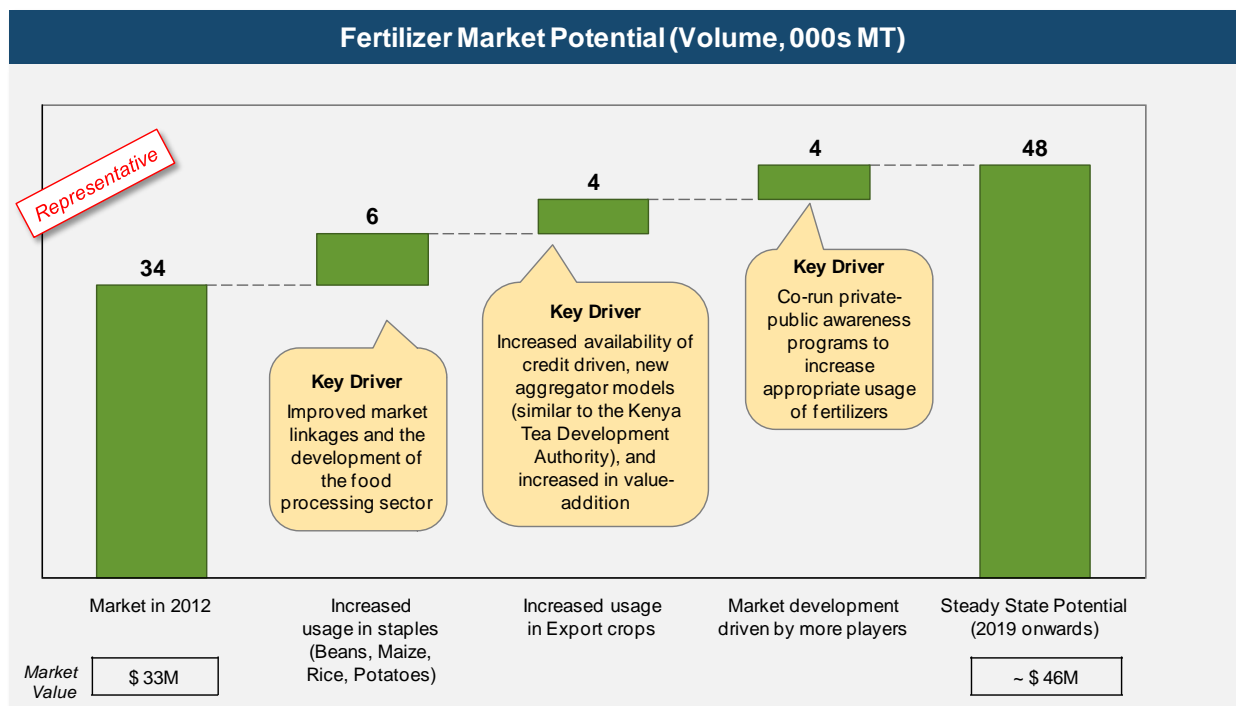
## 2.5 Post-Privatization Market Potential for Fertilizers

Assuming that phase two of privatization, decentralization and the introduction of competition, begins in 2015 and key enabling factors have been set in place by Government and donor organization in phase one — including easier access to finance for farmers, infrastructure improvements, and the development of end markets for increased crop production — the expected market for all fertilizers is forecast to increase from the current 32,200 metric tons per year to approximately 48,000 metric tons per year by 2019.

Rwanda’s fertilizer market will be driven by increasing investments in a number of areas:

- **Agribusiness** investments in processing and exporting will increase the strength of end markets, which in turn will allow farmers to realize value in increased production and incentivize them to use fertilizer.
- **Infrastructure improvements** to ports will reduce the cost of fertilizer imports and increase the marketability of export crops. It will also increase margins on export crops, allowing Rwandan crops to become more competitive regionally and internationally. The reduction in cost of fertilizers will improve profitability for Rwandan farmers.
- Increased **farmer purchasing power** will be spurred by extension services offered by donors, the Government, and private agents. These extension services will help increase the usage rate of fertilizer by farmers in Rwanda (currently 29%) to a level more at par with neighboring countries such as Kenya, where the usage rate is 66%.<sup>9</sup>

Figure 5: Fertilizer Market Potential (volume MT)



While Rwanda’s limited supply of arable land serves as a natural limit to the growth of its agricultural sector — and thus its fertilizer market — private sector players in Rwanda could also extend their activity into other regional markets. Rwanda could also serve as a springboard for investors into additional EAC countries that currently have underdeveloped and underserved fertilizer markets, most notably the Democratic Republic of the Congo (DRC) and Burundi. The DRC currently imports 10,000 metric tons of fertilizer annually; Burundi imports 2,000 metric tons of fertilizer per year. There is room for growth in both markets but especially in Burundi, where the Government is planning to roll out a subsidy program that has potential to increase volumes by an additional 10,000 metric tons. Private sector players who expand into both countries could grow their market by an additional 60%.<sup>10</sup>

<sup>9</sup> Sources: EICV III, Factors Driving the Growth in Fertilizer Consumption in Kenya, 1990–2008; Joshua Ariga.

<sup>10</sup> The 60% accounts for the Government of Burundi’s plans to increase its fertilizer imports to 10,000 metric tons

## **2.6 Enabling Environment**

The attractiveness of the post-privatization competitive landscape is augmented by the attractiveness of Rwanda's business environment. In its 2012 "Doing Business" index, the World Bank ranked Rwanda as the most business friendly environment in East Africa and the third most business friendly country in sub-Saharan Africa.<sup>11</sup> The closest ranked EAC countries were Kenya (No.9), Ethiopia (No.10), and Uganda (No.12). Rwanda offers less bureaucratic red tape, and lower tax rates than its neighbors.

The Government of Rwanda is actively seeking private sector investment into the country, particularly in its agricultural sector. The Government, along with large NGOs and development partners such as USAID, is committed to creating an enabling environment that provides compelling support for investment in Rwanda's agribusiness sector.

Economically, Rwanda has shown robust growth in GDP over the past few years, with a CAGR of 7.5% from 2005-2010.<sup>12</sup> Growth in GDP has been fueled by growth in both the services (tourism, telecom, and banking) and agriculture (cash and staple crop) sectors.<sup>13</sup> Confidence from foreign investors can be seen in the rapid rise in foreign direct investment (FDI), which increased 20% from 2007 to 2009.<sup>14</sup> Growth in FDI has been driven by investments in the telecom, financial, and, to a smaller extent, agricultural sectors (mainly from investments in tea plants). However, FDI remains a small percentage of GDP, at 2.3% in 2009 and 1% in 2010. The Government of Rwanda remains committed to increasing FDI contribution to GDP to 5% in the coming years.<sup>15</sup> The country's continuing efforts to create a better business environment, set against a backdrop of political and macroeconomic stability, should boost investors' interest and confidence in investing in Rwanda going forward.

Furthermore, the Government is committed to making strong investments in improving infrastructure that facilitates intra-regional trade originating from Rwanda.<sup>16</sup> These investments including increased air connectivity, improved road networks, a rail link with regional ports (such as Dar-e-salaam), and expansion of the electricity supply. This commitment will both reduce costs for fertilizer distribution and strengthen the potential for Rwanda to serve as a springboard into regional markets over the medium to long-term.

## **2.7 Long-term Potential Market Developments**

The opportunities for investors will unfold as each of the three phases of the Government's planned privatization are implemented.

- During the Government's first phase of privatization, focused on strengthening the market structure for privatization, investors should establish their business in Rwanda, begin to service the private market for cash crop fertilizers and bid for MINAGRI tenders for staple crops. These efforts will begin to build market presence, key relationships, and distribution channels. By establishing a distribution setup in Rwanda and participating in the tender market will increase the Government's confidence that the investor can deliver the needed fertilizer in a timely and cost-effective manner. Additionally, during this phase the investor should work with donor

---

<sup>11</sup> IFC and World Bank "Doing Business" index, 2012.

<sup>12</sup> BNR.

<sup>13</sup> World Bank.

<sup>14</sup> World Investment Report 2011.

<sup>15</sup> RABA report.

<sup>16</sup> "Brief on Rwanda: Agricultural Investment Opportunities in Rwanda's Food Baskets," Grow Africa Forum, 2011.



organizations and the Government to develop extension services and build model farms. Extension services will include educating farmers the importance of fertilizer usage, appropriate usage techniques, and guiding farmers toward more profitable end markets. Marketing efforts targeting both cash crop and staple crop co-ops and farmers will increase brand awareness to ensure a high market share when the market begins to privatize. During this time, investors should also target markets in Eastern DRC and Burundi to improve volumes.

- During the Government's second phase of privatization, focused on decentralization and increased competition in distribution, investors should continue to engage the segments identified in the first phase while additionally focusing on strengthening the capabilities of agro-retailers through improving technical knowledge. Phase two should involve a slight drop in marketing efforts, as the market and brand recognition will be more established. During this time, investors can also continue to strengthen their market presence by leading activation and distribution efforts.
- During the Government's final phase of privatization, focused on full market liberalization, investors should focus on servicing the newly privatized market for staple crop fertilizers (beans, maize, rice, potatoes, wheat) and further target market leadership across key cash crops (tea, coffee, beans). By this stage, investors who entered the market before privatization should have captured a sizable market share, allowing marketing efforts to be reduced to a steady state. At this point, investors can turn to assessing even longer-term market development opportunities such as entering into production / mixing activities to improve margins for volumes in the region and offering higher-value fertilizers to select demographics.

## 3. Investment Highlights

### 3.1 Opportunity Definition

The investment opportunity identified is the establishment of a fertilizer import and distribution business with potential annual sales of 14,000 MT to agro-retailers in the cash and staple crop market in Rwanda, with potential expansion into adjacent countries (DRC and Burundi). The key fertilizers that the company would need to provide are NPK (25-5-5), NPK (20-10-10), NPK (17-17-17), DAP, Urea, and other specialized fertilizer for cash crops. Given projected growth rates at 5% per annum and a total market size of 48,000 MT by 2019, revenues for this investment are forecast to be \$15 million in market valued at \$40 million to \$60 million by 2019.

This investment opportunity identified requires an investor to enter the current market before privatization occurs in order to ensure capturing a substantial market share. The investor will have to engage in the distribution and sales of fertilizer for both export crops, where the Government does not subsidize fertilizer and private sector players can be competitive, and for staple crops, where the Ministry of Agriculture (MINAGRI) tenders will inhibit the investor's competitiveness. After privatization, an investor will be able to participate in the private market for staple crops and cash crops across the board. A private player who can effectively manage these demands will be able to realize a market share of 30%, in line with the market share leaders in neighboring markets such as Kenya and Tanzania.

### 3.2 Opportunity Specific Attraction

Investment in the project is projected to have an IRR of 39%, which can be improved with leverage. Operations are projected to have an EBITDA margin of 10% by 2019, with net profit being positive by 2015 (Year 3) and free cash flows by 2016. This is predicated on the assumption that competition in distribution will be introduced by early 2015 and that Government and donor interventions will be successful in increasing the market demand for fertilizer.

The opportunity to set up a fertilizer distribution and sales business in Rwanda is attractive in the immediate term due to a weak competitive landscape of firms servicing the private market and the upcoming privatization. While Rwanda's market is small, an early investor can gain a large market share and will eventually be able to service the immediate regional markets of the Eastern DRC and Burundi.

### 3.3 Operating Model

There are generally three operating models for fertilizer firms in Rwanda – (a) companies that compete in tenders and supply to MINAGRI by importing (ex-Kigali) and do not have sales operations in Rwanda, such as MEA Kenya (b) companies that do have a sales office in Rwanda to manage tender bids and service the private domestic market through distributors, such as ETG Kenya, Yara International (c) companies that also own retail stores and run an integrated import-distribute-sell operation, such as Agro-tech, a Rwandan agro-inputs trader.

For the proposed investment, the company should establish a sales office in Rwanda to manage participation in tenders, import volumes, as well as sell to the private market through distributors and agro-retailers. Given the small size of the market, it doesn't make sense to establish direct presence in agro-retailing.

Investors should consider the following imperatives while assessing various operating model elements:

- **Import supply chain:** The high costs of transport from Dar es Salaam will require the investor to figure out the most cost-effective strategies for importing fertilizer on a timely basis. Strong relationships with transportation and logistics firms will be necessary to ensure competitiveness on price and speed of delivery. Investors with a presence in the EAC should try to incorporate shipments to Kigali in their existing supply chains.
- **Bidding for tender:** An investor seeking to win a high percentage of tenders must actively engage with the Government to ensure them of quality and timeliness in delivery. In recent years, annual MINAGRI tender bid applications were distributed toward the beginning of the year, allowing suppliers one month after winning the bid to supply the amount of fertilizer promised. While price is a key determinant in winning bids, the Government of Rwanda has in the past allotted tenders based on the quality of fertilizer provided and the ability of a company to supply the fertilizer in a timely manner.
- **Warehousing:** Given common industry practices and local context, a three-year warehouse and office lease is the most cost-effective way to structure the storage of fertilizers. Local warehousing firms offer labor, electricity, and all equipment fees as part of the overall rent. One of the largest agricultural warehousing companies in Rwanda, ENAS, also provides office space at no extra charge depending on the size of the contract. An investor must engage with warehousing companies to determine the best price and location for storing fertilizer.
- **Distribution channel:** Investors must work with current distributors to select strong retailers that are geographically concentrated in areas with high demand for each fertilizer product. Current Government policies mandate the number and location of retailers, creating efficient market reach while causing many of them to be unprofitable. Investors must be selective in targeting their products and prioritize sales visits to key retailers.
- **Market activation:** Investors will need to work in tandem with donors and Government agencies to provide extension services to farmers and build model farms that will help drive demand for fertilizer. Investors should strictly be involved in strategic coordination and financial assistance, while donors and Government agencies handle the implementation. For the purpose of this business case, Government and donor organizations are assumed to pay 80% of the financial burden because of its relevance to their social impact goals. Investors should work with donors to target extension training to a particular geographical area or to a particular crop producer that will help drive the greatest demand for fertilizer. Financial assistance in model-farm costs will allow investors to target model farms in particular areas and ensure that the farms use their brand of fertilizer, thus increasing brand image and awareness.
- **Institutional buyers:** Top of supply chain players food processors, such as ICM, Minimex, players like Starbucks and crop aggregators are the potential institutional buyers. There are currently no crop aggregators in Rwanda, such as Kenya Tea Development Board. The enabling requirements proposed as part of this investment case recommend the creation of crop aggregators for cash crops. While NAEB has been playing this role of an aggregator through aggregating produce, selling and marketing tea and coffee in regional markets, and providing credit and inputs to farmers, it has been associated with several inefficiencies such as not selecting the right product or causing a delay in tender. The creation of crop-specific aggregators will drive the demand of fertilizer for cash crops and help resolve the dramatic drop in coffee fertilizer usage. Investors should actively engage NAEB and other Government bodies to understand the timeline of activation for the aggregators. The business case assumes that aggregator bodies will be formed and develop over the next few years.

### **3.4 *Key Financials and Capital Requirements***

#### **3.4.1 Capital Investment**

The full capital investment required is approximately \$1.2 million across the investment horizon. The majority of this capital investment will fund working capital requirements and early stage operational losses. To provide a useful basis for investor decision-making, the project has been modeled to reflect a 100% equity capital investment.

#### **3.4.2 Forecast Financials**

The financial model has assumed a 100% equity funded investment, thus there are no financing cash flows (although the financial model maintains the flexibility to reflect debt financing and the resultant financing cash flows). The project is valued on a seven-year horizon and is expected to yield a net income of \$1.05 million by 2019.

Figure 6: Forecast Income Statement Assuming a 100% Equity-Funded Investment ('000 USD)

	2013	2014	2015	2016	2017	2018	2019
<b>Total Revenues</b>	<b>1,571,051</b>	<b>3,039,838</b>	<b>6,009,186</b>	<b>8,497,574</b>	<b>10,901,424</b>	<b>13,187,490</b>	<b>15,323,217</b>
<b>Total COGS</b>	<b>1,530,830</b>	<b>2,958,542</b>	<b>5,553,128</b>	<b>7,719,377</b>	<b>9,776,371</b>	<b>11,691,070</b>	<b>13,431,000</b>
<b>Gross Profit</b>	<b>40,220</b>	<b>81,296</b>	<b>456,058</b>	<b>778,197</b>	<b>1,125,054</b>	<b>1,496,421</b>	<b>1,892,217</b>
SG&A Total	306,000	301,000	266,000	261,000	232,000	232,000	232,000
Rent	31,230	31,230	31,230	105,805	105,805	105,805	134,688
<b>EBITDA</b>	<b>(297,009)</b>	<b>(250,934)</b>	<b>158,828</b>	<b>411,392</b>	<b>787,248</b>	<b>1,158,616</b>	<b>1,525,529</b>
<i>EBITDA %</i>	<i>-18.9%</i>	<i>-8.3%</i>	<i>2.6%</i>	<i>4.8%</i>	<i>7.2%</i>	<i>8.8%</i>	<i>10.0%</i>
Depreciation	-	-	-	-	-	-	-
Interest	-	-	-	-	-	-	-
<b>Earnings Before Taxes</b>	<b>(297,009)</b>	<b>(250,934)</b>	<b>158,828</b>	<b>411,392</b>	<b>787,248</b>	<b>1,158,616</b>	<b>1,525,529</b>
Taxes <sup>17</sup>	-	-	-	(6,973)	(246,409)	(362,647)	(477,491)
<b>Net Income / NOPAT</b>	<b>(297,009)</b>	<b>(250,934)</b>	<b>158,828</b>	<b>404,419</b>	<b>540,840</b>	<b>795,969</b>	<b>1,048,039</b>

The forecast EBITDA margin is lower when compared to listed regional fertilizer companies, with five key comparable companies realizing average EBITDA margins of 14.92% (with a range from 4.8 to 29.3%) from 2008 to 2011.<sup>18</sup> However, this margin is expected to rise toward the average as marketing costs decrease and economies of scale improve.

Figure 7: Forecast Cash Flow Statement ('000 USD)

	2013	2014	2015	2016	2017	2018	2019
<b>Cash Flow from Operations</b>							
Earnings from P&L	(223,009)	(181,934)	192,828	368,941	540,840	795,969	1,048,039
Depreciation	-	-	-	-	-	-	-
Net Interest (after tax)	-	-	-	-	-	-	-
(Change in net Working Capital)	(204,551)	(191,236)	(386,609)	(323,988)	(312,981)	(297,646)	(278,072)
<b>Total Cash Flow from Operations</b>	<b>(427,560)</b>	<b>(373,170)</b>	<b>(193,781)</b>	<b>44,953</b>	<b>227,858</b>	<b>498,323</b>	<b>769,967</b>
Investment (Capex)	-	-	-	-	-	-	-
Terminal Value <sup>19</sup>							4,576,587
<b>Free Cash Flows</b>	<b>(427,560)</b>	<b>(373,170)</b>	<b>(193,781)</b>	<b>44,953</b>	<b>227,858</b>	<b>498,323</b>	<b>5,346,554</b>
Cumulative Cash Flows	(427,560)	(800,730)	(994,511)	(949,558)	(721,700)	(223,377)	5,123,177

<sup>17</sup> Carried tax benefits from years with negative earnings are accumulated for five years.

<sup>18</sup> Financial statements of publically traded fertilizer companies.

<sup>19</sup> Terminal value is calculated at three times EBITDA of the terminal year (2019).

### 3.5 Projected Returns

Projected returns have been calculated for four key metrics: net present value (NPV), the project's internal rate of return (IRR), the return on invested capital (ROIC) in Year 7, and the EBITDA return in Year 7.

Figure 8: Projected Returns

NPV	\$801,351
Project IRR	43%
ROIC (yr 7)	52.5%
EBITDA Return (yr 7)	76.5%

### 3.6 Key Risks and Mitigation Steps

Assuming that the second phase of privatization focused on decentralization and the introduction of competition begins in 2015, the key risks that a company needs to address fall into four categories: regulatory, market, competitive, and financial.

#### 1. Regulatory Risks

**Delay in privatization:** Privatization is stalled by lack of alignment on timing or actions or is executed much more slowly than anticipated, leaving the investor building distribution capacity that cannot be utilized until the market is privatized.

- **Mitigation:** Investors will need to work closely with the Government and donors to understand and provide input to the privatization strategy and implementation. In parallel, investors should accelerate and enhance service to the cash crop market by building partnerships with top of the value chain players (like Starbucks in Coffee, food processors like Minimex, Pembe) to aggregate SHFs and subsequently demand.

#### 2. Market Risks

**Slow consumer adoption:** Consumers may be slower than expected to increase their utilization levels or use a new brand of fertilizer, particularly if there is an increase in the price of fertilizer as the result of the withdrawal of subsidies. As a result, the captured market share may be less than 30% by 2019.

- **Mitigation:** Investors can offer promotional prices for fertilizer to attract new consumers. They can also intensify their marketing efforts by increasing the number of extension services and/or model farms reached. Perhaps most importantly, they need to constantly coordinate with the Government on the potential impact of privatization efforts to ensure that the decrease or withdrawal of subsidies corresponds with cost reductions savings on the investor's side, e.g., the lower transport costs.

**Market crowding:** Privatization attracts a number of additional players to the market, making it highly competitive. Private sector players have to lower prices to win market share resulting in profit losses.

- **Mitigation:** Build on first mover advantage, and invest in strong distribution and sales capabilities and develop strong partnerships with donors and co-invest in activation programs

#### 3. Partnership Risks

**Limited donor / government support:** Donor organizations and Government agencies do not sufficiently support market development activities such as model farms and extension services to farmers, thus increasing costs of activation for investors.

- **Mitigation:** Investors can selectively target donor organizations or Government agencies whose strategic interests are aligned across the same axes as the investment requires. Examples of such strategic interests include be increased fertilizer usage by smallholder farmers, greater income generation for smallholder farmers, or increased land productivity.

#### 4. Financial Risks

**Price volatility due to foreign exchange (FX) and oil price fluctuations:** Fertilizer is primarily bought from outside the EAC, creating strong exposure to price shocks; meanwhile, increasing price of oil can create spikes in the price of fertilizers.

- **Mitigation:** Investors can create regional strategies to hedge against risk via financial instruments. They can also enter into long-term fixed price contracts with upstream fertilizer manufacturers.

#### 3.6.1 Sensitivity Analysis

A delay in the privatization of the staple crop fertilizer market presents a significant risk to the investor. The current assumption is that the first phase of privatization focused on market building efforts will start in 2013, and by 2019 half of the total staple crop fertilizer market will be privatized. The drop in demand and expected revenues from a delay would create an unprofitable business case. In the most pessimistic scenario, assuming privatization does not happen before 2019, the NPV of the project would fall to -\$850,000.

Assuming privatization occurs, the greatest risk facing the investor is the Government or donor not increasing support for extension services and / or model farms. Currently, the costs of extension services and model farms are split, with the Government and donors paying for 80% and the investor covering the remainder. In the most pessimistic scenario, where Government and donors do not contribute, the NPV would fall to \$140,000, severely decreasing the attractiveness of the investment. In case the government and donors are able to commit to more investments, the IRR can improve to 44% driven by higher sales volumes.

**Figure 9: Sensitivity Analysis**

	No Privatization		
	Base Case	New Case	Percent Change
<b>NPV</b>	\$692,810	<b>\$(850,236)</b>	-223%
<b>Project IRR</b>	39%	N/A	
<b>ROIC (yr 7)</b>	53%	16%	-70%
<b>EBITDA Return (yr 7)</b>	76%	16%	-79%
<b>Total Investment</b>	\$1,171,511	\$1,746,961	49%
Equity Investment	\$1,171,511	\$1,746,961	49%
Debt Investment	\$-	\$-	
<b>Revenues (yr 7)</b>	\$15,323,217	\$13,400,765	-13%
<b>NOPAT (yr 7)</b>	\$1,048,039	\$275,637	-74%
<b>Operating Cash Flow (yr 7)</b>	\$769,967	<b>\$(21,867)</b>	-103%
<b>Sales (MT, yr 7)</b>	14,289	13,710	-4%

<b>No Government Support</b>			
	<b>Base Case</b>	<b>New Case</b>	<b>Percent Change</b>
<b>NPV</b>	\$692,810	\$136,395	-80%
<b>Project IRR</b>	39%	26%	-34%
<b>ROIC (yr 7)</b>	53%	47%	-11%
<b>EBITDA Return (yr 7)</b>	76%	68%	-11%
<b>Total Investment</b>	\$1,171,511	\$1,756,107	50%
Equity Investment	\$1,171,511	\$1,756,107	50%
Debt Investment	\$-	\$-	
<b>Revenues (yr 7)</b>	\$15,323,217	\$15,323,217	0%
<b>NOPAT (yr 7)</b>	\$1,048,039	\$932,623	-11%
<b>Operating Cash Flow (yr 7)</b>	\$769,967	\$654,551	-15%
<b>Sales (MT, yr 7)</b>	14,289	14,289	0%



## 4. Financial Projections and Assumptions

### 4.1 Financial Forecasting Model

In order to develop a comprehensive business plan for the proposed fertilizer processing operation, a detailed financial spreadsheet model was created. The model examines the value and impacts of this investment from the bottom up, creating revenue and cost forecasts as well as estimates of the necessary capital expenditures. The model's key objectives:

- To provide flexibility to test and alter assumption and inputs in the future
- To identify and capture the key input levers that drive financial requirements and return
- To identify and assess the financial and economic impacts and results

The key variables used in the model are:

- **Inputs:** High-level inputs such as the costs of property, plant, and equipment; operating costs; sales volumes and prices; working capital requirements; and debt ratio
- **Cost of capital:** Calculation of the appropriate discount rate for the proposed operations, taking into consideration key determinants such as the risk-free rate, marginal risk premium, and the unlevered beta coefficient
- **Market analysis:** Calculation of the approximate size and growth of four key markets (export crop, aggregator, MINAGRI tender market, and privatized staple market)

The key outputs of the model include:

- **Debt:** Breakdown of the schedule for debt repayments, including principal and interest portions
- **Financials:** Income statement, balance sheet, and cash flow statements, including key performance measures
- **Outputs:** Summary of the key return metrics and capital requirement

### 4.2 Assumptions

Any assumptions included in the model are based on the best available data and have been cross-checked with alternative sources whenever possible. All assumptions are intentionally conservative so as not to overstate the potential of the investment opportunity.

The inputs used in this model are likely to require some adjustment as the development of the fertilizer industry moves forward. The model allows for adjustments of financial assumptions, costs, prices, market demand, captured market share, and — most importantly — the fertilizer privatization schedule.

In order to provide a base case applicable to a variety of investors, no development debt has been recognized. This allows the model to accurately reflect the returns to equity, without having to know the specific debt financing terms that will be available to different investors. The model also has the flexibility to include and accurately reflect the use of development debt should an investor require this functionality.

The model splits sources of income into two distinct markets: (1) the cash crop market and (2) the staple crop market. The cash crop market is further divided into (1) farmers that are part of crop aggregators

and (2) farmers not part of crop aggregators. The staple crop market assumes that the market will gradually privatize, hence the investor will participate in the MINAGRI tender from 2013 (the first year of operations) and also start supplying to the private market in 2015 when the Government introduces competition into distribution.

**4.2.1 Market Size**

The sizes of both the cash crop fertilizer market and the staple crop fertilizer market were calculated using inputs from Government sources, regional comparables, and expert interviews.

The cash crop fertilizer market, currently calculated at 2,200 metric tons per year, is forecast to increase to more than 8,000 metric tons by 2019.<sup>20</sup>

**Figure 10: Fertilizer Volumes – Cash Crops (MT)**

	2012	2013	2014	2015	2016	2017	2018	2019
<b>Total Market Size</b>	<b>2,210</b>	<b>2,500</b>	<b>2,800</b>	<b>5,400</b>	<b>5,800</b>	<b>6,200</b>	<b>6,600</b>	<b>8,000</b>

<sup>20</sup> The growth target was calculated using the expected growth of coffee and tea exports versus the increase in total land area, holding fertilizer utility constant, and then adding a nominal 100 metric tons for other export crops (horticulture, pyrethrum, etc.), which currently use only 10 metric of fertilizer, according to interviews with experts.

Figure 11: Fertilizer Volumes – Staple Crops (MT)

	2012	2013	2014	2015	2016	2017	2018	2019
Total Market Size	34,000	34,000	35,000	36,000	37,000	38,000	39,000	40,000

#### 4.2.2 Capital Expenditure

Capital expenditures are minimal for this investment because the investment does not require the purchase of fixed assets. The land and building costs cover the rental of a warehouse and office. Leased storage usage is assumed based on standard practices. The small costs incurred from purchasing supplies and materials do not substantiate a large capital expenditure and hence can be marginalized in the overall calculation.

#### 4.2.3 Revenues

Revenue forecasts are driven by two components: (1) sales volumes, which have been determined based on analysis of the market share captured for each market; and (2) sales prices, which have been calculated for each market.

The assumption is that fertilizer will be sold to export crop producers, and a share of the tender market will be won, in Year 1. Low competition, combined with strong marketing efforts in the export crop producer market, should ensure revenue in the first year for at least one growing season, if not both seasons. While tender markets are harder to predict, presence within the country should enable the capture of a small share of the tender market.

Market share captured is expected to increase from 5% in Year 1 to 30% by 2019. Despite low competition in the export crop fertilizer market, existing farmer habits will restrict a new player from taking a sizeable market share in the first year. In subsequent years, market share is expected to slowly increase; however, the threat of new entrants in future years will restrict the investment from having a majority market share during the project horizon.

Figure 12: Export Market Sales (Excluding Aggregators)

	2013	2014	2015	2016	2017	2018	2019
Market Size (MT)	2,534	2,876	2,913	3,074	3,213	3,326	3,413
Market Share Captured (%)	5%	9%	13%	18%	22%	26%	30%
Total Sales (MT)	127	264	388	538	696	859	1,024

As per the crop aggregator market, market-building activities will enable the capture of a larger share of the aggregator market — from 20% in 2013 to 30% by 2019.

Figure 13: Aggregator Market Sales

	2013	2014	2015	2016	2017	2018	2019
Market Size (MT)			2,494	2,729	3,009	3,337	3,717
Market Share Captured (%)			20%	23%	25%	28%	30%
Total Sales (MT)			69	131	216	327	471

Prices for fertilizer supplied to the export crop value chain include current prices for the NPK (25-5-5) and NPK (20-10-10) sold to distributors in Rwanda (approximately \$1,000 per metric ton) plus a 10% premium to account for better quality.

**Figure 14: Product Prices (USD/MT)**

Export Market Crop Fertilizer	\$1,103
-------------------------------	---------

Market share in the staple crop tender market is expected to increase from 5% in 2013 to 30% in 2019. While maintaining stable market share is uncertain due to the nature of a tender, it is fair to assume a constant increase in market share; past winners of tenders have continued to win tenders in subsequent years. The increasing market share is attributed to larger economies of scale over time, thus decreasing bid values and increasing the odds of winning larger bids. The high competition in MINAGRI bids caps the feasible market share capture at 30%.<sup>21</sup>

**Figure 15: Tender Market Sales**

	2013	2014	2015	2016	2017	2018	2019
Market Size (MT)	30,000	31,429	29,571	27,429	25,000	22,286	19,286
Market Share Captured (%)	5%	9%	13%	18%	22%	26%	30%
Total Sales (MT)	1,500	2,881	3,943	4,800	5,417	5,757	5,786

A privatized fertilizer market in Rwanda will allow early movers an advantage in securing high market share (30%) at the onset of privatization. This market share is expected to remain constant over the project horizon due to increased competition. Larger spending in marketing and market-building could result in increased market share.

**Figure 16: Private Market Sales**

	2013	2014	2015	2016	2017	2018	2019
Market Size (MT)			3,614	7,543	11,786	16,343	21,214
Market Share Captured (%)			30%	30%	30%	30%	30%
Total Sales (MT)			1,084	2,263	3,536	4,903	6,364

Sales prices for the tender market are set at the weighted average of 2012 tender bids for each type of fertilizer — DAP, Urea, and NPK (17-17-17) — and the amount of each tendered. The ratio of the fertilizer imported is expected to remain constant, hence the weighted average price should also remain relatively constant. Prices for the private market are calculated by adding a standardized profit margin (derived from average profit margins for regional firms) to the costs of landed fertilizer in Kigali.

**Figure 17: Product Prices (USD/MT)**

Tender Market Average	954
Private Market Average	1,170

<sup>21</sup> The average market shares for the largest and second-largest fertilizer distributors in the EAC are 30% each.

#### 4.2.4 Costs

Operational costs are informed by analysis of the cost structures of regional players, with actual costs specific to Rwanda. The primary driver of operational costs for all fertilizers sold is the cost of goods sold, which includes the cost of raw materials, handling costs, import tax costs, and transportation costs per metric ton.

**Figure 18: Cost of Goods Sold (USD/MT)**

	<b>Export Market Fertilizer<sup>22</sup></b>	<b>Tender Market Fertilizer<sup>23</sup></b>	<b>Privatized Market Fertilizer<sup>24</sup></b>
<b>CIF Price Dar es Salaam</b>	745	789	789
<b>Transportation</b>	140	140	140
<b>Import Tax</b>	15	15	15
Handling <sup>25</sup>	4		4
<b>Total</b>	<b>904</b>	<b>944</b>	<b>948</b>

*Source: Processor and Farmer Interviews; Monitor Analysis.*

Rent prices are an integral component of the operational costs, calculated as the product of warehouse area and cost of warehousing per metric ton. Rent prices are inclusive of small administrative office space, labor, electricity, and all other costs associated with warehousing. Required storage space is determined as the maximum amount of space required over a three-year time horizon. The warehouse cost is calculated as the product of the average warehousing cost per metric ton and the maximum percentage of fertilizer stored.

<sup>22</sup> Average weighted costs of all utilized fertilizers.

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.

<sup>25</sup> Tender market does not have to pay handling cost.

**Figure 19: Cost of Warehousing per Annum (USD/MT)**

	2013	2014	2015	2016	2017	2018	2019
Warehouse Price per MT	\$48	\$48	\$48	\$48	\$48	\$48	\$48
Total Unit Demand (MT) <sup>26</sup>	127	264	1,972	3,415	4,984	6,680	8,503
Max Demand over 3 years (MT)	1,972	1,972	1,972	6,680	6,680	6,680	8,503
Max % in Warehouse	33%	33%	33%	33%	33%	33%	33%
<b>Warehousing Price (USD)</b>	<b>\$31,230</b>	<b>\$31,230</b>	<b>\$31,230</b>	<b>\$105,805</b>	<b>\$105,805</b>	<b>\$105,805</b>	<b>\$134,688</b>

Source: Warehouse Operator Interviews; IFDC Interviews; Monitor Analysis.

Selling and administrative costs make up the balance of operational costs. Selling costs reflect the need to heavily promote the use of fertilizer through model farms, extension services, an active sales force, and other promotional activities. While donor and Government organizations will help cover the costs of model farms and extension services, sales force costs and other promotional activities will be covered by the investing company.

**Figure 20: Selling Costs per Annum<sup>27</sup> (USD/MT)**

<sup>26</sup> This does not include tendered fertilizer, as the investor does not need to store the fertilizer locally.

<sup>27</sup> Assumes donor and government agencies pay for 80% of model farm and extension worker costs.

	2013	2014	2015	2016	2017	2018	2019
<i>Extension Worker Costs</i>	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000	\$90,000
Number of Extension Workers	30	30	30	30	30	30	30
Yearly Cost per Extension Worker (USD)	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
<i>Model Farm Costs</i>	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000	\$120,000
Number of Model Farms	60	60	60	60	60	60	60
Cost per Model Farm	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Total Donor Support</b>	<b>\$168,000</b>	<b>\$168,000</b>	<b>\$168,000</b>	<b>\$168,000</b>	<b>\$168,000</b>	<b>\$168,000</b>	<b>\$168,000</b>
<b>Investor Portion</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$42,000</b>	<b>\$42,000</b>
<i>Salesforce Costs</i>	\$90,000	\$90,000	\$60,000	\$60,000	\$36,000	\$36,000	\$36,000
Number of Sales Agents	15	15	10	10	6	6	6
Cost per Sales Agent	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
<i>Other Marketing Costs</i>	\$30,000	\$25,000	\$20,000	\$15,000	\$10,000	\$10,000	\$10,000
<b>Total Selling Costs to Investor</b>	<b>\$162,000</b>	<b>\$157,000</b>	<b>\$122,000</b>	<b>\$117,000</b>	<b>\$88,000</b>	<b>\$88,000</b>	<b>\$88,000</b>

Administrative costs are fixed in nature and reflect the cost of general staffing on an annual basis.

**Figure 21: General and Admin Costs (USD per annum)**

Salary of Managing Director	\$60,000
Salary of Director of Operations	\$30,000
Salary of Accountant	\$12,000
Total Salary of Other Permanent Staff	\$42,000
<b>Total</b>	<b>\$144,000</b>

Source: Karisimbi; Monitor Analysis.

#### 4.2.5 Other Inputs Assumptions

Other input assumptions include working capital requirements, corporate tax rates, treatment of tax losses, and the opportunity cost of capital. These inputs have largely been drawn from analysis of benchmarked parties operating in the fertilizer industry, as well as information obtained from Rwandan tax authorities. These inputs are detailed below:

**Figure 22: Working Capital Requirements**

Percent of Sales	13%
------------------	-----

Source: Expert Interviews; Regional Company Interviews; Monitor Analysis.

**Figure 23: Tax Treatments**

Corporate Tax Rate	30%
Straight Line Depreciation (years)	25
Carry for Tax Losses (years)	5

Source: Ernst & Young Rwanda.



The opportunity cost of capital (OCC) — also known as the weighted average cost of capital — was determined using the capital asset pricing model. The zero debt OCC aligns very closely with the average return levels (25%) that investors indicated they would require for equity investments in Rwanda.<sup>28</sup>

**Figure 24: Opportunity Cost of Capital**

Risk-free Rate	9.5%
Unlevered Beta	1
MRP	13.5%
Tax Rate	30%
Long-term Debt Ratio	0%
D / E Target	0
D / V Target	0%
Levered Beta	1
Opportunity Cost of Debt	17%
Unlevered Cost of Capital	23.0%
<b>OCC</b>	<b>23.0%</b>

*Source: National Bank of Rwanda; Damodaran; Monitor Analysis.*

<sup>28</sup> Investor interviews carried out by Monitor Group (n=93).

## 5. Enabling Requirements

The government, financial institutions, and donor organizations are actively implementing or considering and planning, a number of enabling requirements designed to facilitate sustainable, private sector-driven development of Rwanda's fertilizer sector. These include measures to:

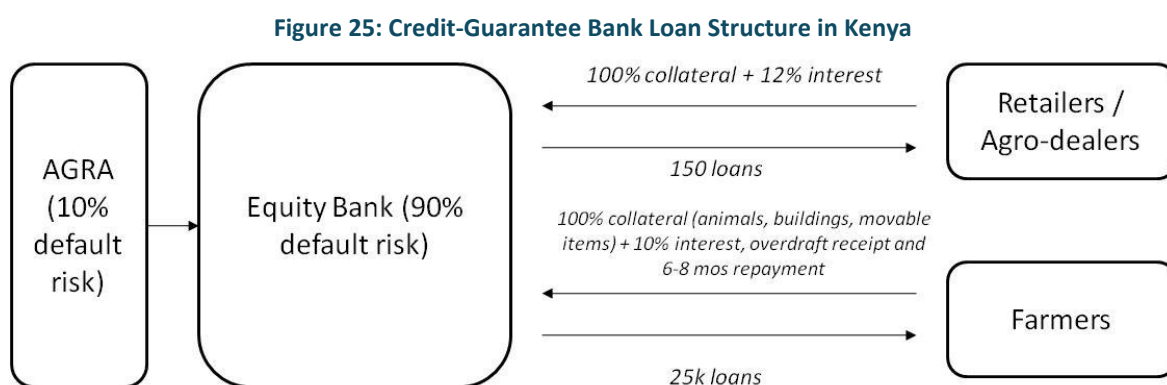
- Improve access to credit for smallholder farmers
- Create of market linkages to absorb additional yields
- Invest in farmer training and extension services
- Improve the infrastructure connecting Rwanda with Dar es Salaam and other markets and ports

Each of these requirements is described in more detail below.

### 5.1 Access to Credit

The Government of Rwanda will work in conjunction with donor organizations to improve smallholder farmers' access to finance, which will help farmers manage cash flow issues at the beginning of harvests. Based on successful models in Africa, potential avenues for increasing access to finance include:

- Mandating commercial and/or national banks to create special financing products for farmers and agro-dealers. This might include:
  - Extending **credit guarantee-backed loans** to retailers, agro-dealers, and farmers with 10 to 12% interest rates and 100% collateral (see **Figure 25**). For example, the Government of Kenya (via AGRA) provides a credit guarantee to cover 10% of any default losses, with Equity Bank assuming the remaining 90% default risk. Loans to farmers provide for overdraft receipt and six- to eight-month repayment terms.



- Creating output-driven financing institutions where farmers can pay loans via crops produced. Examples of this approach include aggregator models such as Kenya Tea Development Agency or less extensive models such as the Ghana Cocoa Board.
- Lending to groups of farmers at a village level. Extending microfinance loans to farmer collectives or co-ops has been shown to reduce default rates, because if forces participating farmers hold one another accountable for the repayment of the loan.

## **5.2 *Increasing End Market Linkages***

Without proper intervention by the Government, the privatization of the fertilizer industry in Rwanda could cause a drop in fertilizer demand. Improving farmers' access to finance, as outlined above, is one such intervention. Additionally, the Government will need to rally farmers' interest in using fertilizer for crops that do not currently enjoy a large end market. The increase in institutional buyers (either private sector or crop aggregators) will help combine a number of these initiatives into one body that will oversee a particular crop with a steady or growing export market. In Kenya, crop aggregators have been shown to greatly increase fertilizer usage among smallholder farmers.

## **5.3 *Smallholder Farmer Development***

Public investment in building capacity among smallholder farmers will be critical, especially in the provision of inputs required for farmers to operate optimally and in the creation of model farms. Investments in extension services will also help expand the technical knowledge and skills of smallholder farmers, training them in the adoption of new farming techniques and the proper use of appropriate inputs. Investments in capacity building should be extended to cooperatives, in order to ensure that they are properly organized and possess the skills necessary to manage the link between smallholder farmers and fertilizer companies. Investors should expect to cover 20% of the capacity building cost, with donors and Government organizations covering the remaining 80% (\$1.2 million over seven years).

## **5.4 *Infrastructure***

Improving the roads that run from Dar es Salaam to Kigali will decrease transit times, lower the overall costs of transport, and reduce farm-gate prices for smallholder farmers. Such improvements will also bolster the marketability of crops produced in Rwanda, thus increasing market linkages and further encouraging the purchase of fertilizer by farmers. Similarly, creating better internal road linkages within Rwanda will improve the ability to easily distribute fertilizer and provide extension services.

## 6. Development Benefits

This investment opportunity in fertilizer distribution and sales has the potential to increase the overall competitiveness of the export crop sector in Rwanda, both internally (increasing food security) and externally (increasing exports).

This investment can also help bolster Rwanda's food security in two ways: (1) by increasing the yield, and therefore the income, of smallholder farmers, and (2) by improving the sophistication of these farmers' farming practices. For example, correct fertilizer usage is expected to increase coffee yields and increase farmer profit by 22.5% (by \$24 per year). Additionally, armed with better access to (and knowledge of) credit and co-ops, and increased training in planting and harvesting best practices, smallholder farmers will be able to improve their crop yields and quality, increasing their revenues and leading to income sustainability.

A typical coffee farmer can expect an increase in profits of 22.5% from this project:

**Figure 26: Expected Improvements to Out-Grower Incomes – Economics for a sample Coffee Farmer**

(A) Current Annual Income	\$220
(B) Current Annual Profits	\$107
(C) Expected Income with appropriate fertilizer usage	\$264
(D) Additional Fertilizer Costs	\$20
<b>(E) Increase in Revenues [C-A]</b>	<b>\$44</b>
<b>(F) Increase in Profits [C-A-D]</b>	<b>\$24</b>
<b>Increase in Profits [F/B, %]</b>	<b>22.5%</b>

Source: SPREAD and Coffee Expert Interviews; Monitor Analysis; IFAD; Technoserve.

## 7. Way Forward

The pending privatization of the majority of Rwanda’s fertilizer market makes this an opportune time to consider this investment. The internal rate of return (IRR) on this investment is estimated to be 39%. However, in order to be successful, investors must be willing to engage with Rwandan Government agencies, donor organizations, and smallholder farmers. Investors who are able to invest for long-term revenue generation, have sufficient capital to finance a \$1.2 million investment over seven years, and are already established in the global fertilizer market are best suited for this opportunity. Investors who can meet these criteria and properly engage with all stakeholders will be able to gain first-mover advantage and capture at least 30% of the fertilizer market, resulting in revenues of \$15 million — and profits of near \$2 million — by 2019.

### 7.1 Target Investor Profiles

The fertilizer distribution and sales investment opportunity is best suited for a company that fits the following profile:

- **Type of company:** Engaged in fertilizer trading and is a regional or international distributor or fertilizer producer.
- **Current geographic focus:** Already active in fertilizer in the East African Community’s larger markets — namely, Tanzania, Kenya, and Uganda — and has established supply chains to EAC ports. Alternatively, the company might not yet be active in the EAC but is seeking a stable, business-friendly environment in which to test pilot projects in the region.
- **Current involvement in MINAGRI fertilizer tender:** Already or will be shortly involved in the tendering process with MINAGRI and can build on that relationship to capture a higher market share.
- **Product range:** The company is able to supply multiple types of fertilizer — including NPK (all varieties), DAP, and Urea. A company unable to supply multiple types of fertilizer will likely see its market size shrink, losing business to players that can supply all three.

### 7.2 Next Steps

To successfully execute this investment, prospective investors will need to build relationships with public and donor stakeholders. Establishing key relationships with IFDC, MINAGRI, NAEB, and USAID, among others, will help foster investors’ understanding of the fertilizer privatization schedule, increase their access to distributors, and drive farmer engagement via extension services and model farms. Investors will also need to build relationships with regional transportation companies in order to reduce transportation costs. Finally, investors will need to implement their own due diligence process focused on farmers’ willingness to pay for fertilizer and their adoption rates of new products. This upfront effort during the initial stages of privatization will well position to capture market share as the privatization process unfolds.