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**THE IMPLEMENTATION OF THE VALUE CHAIN FOR SOYBEAN FARMING**

*A CASE STUDY OF THE NORTHWESTERN REGION OF CAMEROON- NGOKETUNJIA*



A BUSINESS MODEL-INCREASING THE PRODUCTIVITY OF SOYBEAN FARMING

AUGUST 2014

# FOREWORD

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# EXECUTIVE SUMMARY

There is a high demand for soybean products in Cameroon yet the country is experiencing low soybean production levels and has triggered more importation of the product. This has created an opportunity in the domestic market. AgriDynamic Foundation, a non-profit social entrepreneurial organization has identified this potential market and aims at revamping the soybean sector in rural areas starting with Ngoketunjia region. The organisation has developed a soybean value chain but needs to find the best business approach that can efficiently and effectively increase the production of soybeans.

This project aim was to find out the challenges and risks limiting the farmers from producing more soybeans despite the favourable climatic conditions and soil. By looking at the root problems, a business model could then be developed to fit both the farmers and organisation objectives.

Soybean farmers, retailers, suppliers and institutions were personally interviewed by the researcher. The data collected was analysed using Microsoft Excel where charts and tables where used to present the findings. The researcher discovered that majority of the soybeans farms were small scale labour intensive farms mostly farmed by females.

The reasons that limited the farmers from increasing soybean production were the lack of technical knowledge and skills on soybean production, lack of proper tools, inadequate finances and the high risks involved in soybean farming due to poor seed. The research showed that most farmers used fertilizer yet they produced less soybeans than the farmers that did not use fertilizer.

By looking at the root problems that were limiting soybean production in Ngoketunjia region, the researcher was able to develop a business model that AgriDynamic could implement. The model’s objective would be to educate farmers on the best ways of minimizing production costs. This is followed by validating and harmonizing new/existing initiatives with the new/existing tools and mechanisms to fit recognized soybean standards. This can then be used by all stakeholders.

Ultimately, AgriDynamic will become the central marketing hub that connects the farmers, resellers and institution. By providing an organized market with acceptable soybean prices and quality, this would encourage farmers to increase production at low costs taking advantage of economies of scale.

# ACRONYMS

IITA: International Institute of Tropical Agriculture

IRAD: Institute of Agricultural Research for Development

NISA: National Institute for Sustainable Agriculture

NAMC: National Agricultural Marketing Council

MINEDA: Ministry of Agricultural and rural Development

UNVDA: Upper Nun Valley Development Authority

CURRENCY**: 1 Euro = 655** Central Africa **CFA** Franc

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# CHAPTER ONE

# *Introduction and Background of the Study*

## Introduction

Soybean farming has created a great opportunity for farmers in Cameroon especially in rural settlements where farming is the main economic activity. Soybeans already have a large available market. This in turn has created great income opportunities that will improve the livelihood of farmers and prompt rural development.

This report focuses on finding a business approach that will facilitate the growth of soybeans production in rural farming areas. AgriDynamic will play a major role in facilitating the increment of soybeans farming in Ngoketunjia region. The region is located in the North-West part of Cameroon. Soybean farming has been identified as a profitable business venture that would not only feed people in rural areas but could also aid in the development of the area. The first step the organisation has taken is the creation of a soybeans value chain.

The soybeans value chain as drawn by AgriDynamic shows the process of soybeans production from the time it is farmed to the commercialization of the soybeans products. The functions played in the production, the actors involved and external influencers of soybean production have been identified. The details will be outlined in chapter two.

Thus, the task that remains is identifying the best efficient and effective approach that will facilitate rural farmers to increase the profitable production and promotion of soybeans. This approach will help ensure that the farmers are well trained to profitably reap the benefits of soybean farming.

## 1.1 Background of the Study

Ngoketunjia which is located in the North-Western rural area of Cameroon, characterised with favourable weather conditions and soil that supports soybean farming. Currently there is low supply of soybeans which has led to more importation of the product. This sets as an opportunity for the local farmers as the market is readily available. The current soybean farmers are producing mostly for household purposes and only selling excess in the local market. Some of these farmers have approached AgriDynamic to assist them in the production and commercialization of the soybean so that they can optimize on this opportunity.

## 1.2 Statement of the Problem

Cameroon has an available market for soybean production with great opportunities for farmers. Even though currently there is low production of soybeans, the farmers are willing to seize this opportunity. The substantial growth of importation indicates that there is a large local market opportunity. They have approached AgriDynamic to help them increase the production of soybeans. AgriDynamic found it essential to develop a soybeans value chain. A well-developed value chain without well-set strategies of implementing it can just be like a computer collecting dust because the owner is not knowledgeable on how to effectively utilize it.

The task at hand is to create a business model for the farmers and AgriDynamic to use when implementing the soybeans value chain. The business model is a concept that they will use as a road map for increasing the production of soybeans. This concept will allow them to easily understand and implement the value chain.

The North-West region is characterised with favourable climatic conditions and fertile soil. With the positive attitude from the farmers and a well-developed value chain, what remains is the means on ensuring that the farmers implement the value chain. In like manner, this investigation sets upon what AgriDynamic can put in place to help the farmers to cost effectively produce the soybean and commercialize it. This will look at the best business strategies that can help farmer’s buffer challenges and risks associated with soybean production. Therefore, by closely studying the challenges they incur that limits their potential to optimize on soybean farming, the research aims at developing a business model to help revamp this great opportunity.

## 1.3 Objectives

1. To find out the challenges and risks faced by the farmers and AgriDynamic in increasing the production of soybeans.
2. To examine a business model that supports the goals of the farmers and the organisation.
3. To find out what and where AgriDynamic should place emphasis upon in the training program.
4. To develop a strategic approach that AgriDynamic can implement to ensure that the soybean production is sustainable and viable.

## 1.4 Research Questions

What business model should be implemented to ensure that soybean production is viable and sustainable for the local farmers and the organisation?

The following questions will help in finding answers to the main question.

1. What challenges and risks are being faced by the farmers and the organisation?
2. How can the above be tackled and minimized respectively?
3. Where and what should the organization emphasize upon in the training program?
4. What then is the best strategic approach AgriDynamic should implement to ensure the soybean production is sustainable for the farmers and the organisation at large?

## 1.5 Significance of the Study

Due to extreme low production capacity of farmers, there is low supply of soybean products and an increase in importation (Ngochembo, 2010). This opens up an opportunity for rural farmers to serve the domestic market. It entails that indeed there is a large market for soybean production and commercialization but how then, can it be optimized? Thus, it is essential to evaluate various circumstances on what can be implemented, and how it will be implemented to ensure the profitability of soybeans. The business concept will help the farmers to efficiently and effectively increase productivity. This will also aid the government in their aim of eradicating poverty and creating a more sustainable economy in the rural area.

## 1.6 Scope of the Study

The research will concentrate on the North-western part of Cameroon, a region called Ngoketunjia. The rural farming area that the research will be based on is Bamessing which is divided into different quarters. The research concentrates on the four of the quarters where farmers will be interviewed. It will also consider suppliers and retailers including supporting institutions based in the town of the area-Bamenda.

## 1.7 Chapter Synthesis

The chapters in the research report have been arranged and synthesized as follows;

* Chapter two: literature review

This chapter evaluates the different concepts that build on soybeans farming in the market world, the value chains used and how it’s important in the development and sustainability of rural areas.

* Chapter three: methodology

This chapter looks at the methods that would be used to ensure that the research objectives are achieved.

* Chapter four: research findings

The chapter gives the research findings as found in chapter three, giving a description of the data collected.

* Chapter five: Discussion and Conclusion

This is where the different findings in chapter four will be discussed. A conclusion of the research findings will then be drawn.

* Chapter Six: Recommendations

Recommendations based on the research findings will be given in this chapter.

# CHAPTER TWO

# *Literature Review*

## Introduction

This chapter evaluates the different concepts and views by different authors on soybean farming in Africa and in the world market. It reviews the importance of soybeans to these economies and the community at large. It looks at the strategies that have been used to help improve the productivity of soybeans and how soybeans can be a sustainable business venture for development. It also evaluates on the value chain that has been developed to effectively increase the productivity of soybeans, giving an understanding on soybeans performance in the business market.

## 2.1 The Value of Soybeans in the World Market

Soybean has created a proven reputation of being the cheapest source of high quality protein for animal feed and human consumption. It has the ability to replace the protein attained from meat and proves to be a much better source as it does not have saturated fats (FAO, 2009). This is also supported by IITA (2009) who state soybean as an important source of high quality inexpensive protein and oil which contains no cholesterol. As compared to more expensive protein foods like meat, fish and eggs, soybeans is considered the cheapest.

Soy meal and soy oil have also intensified over the years. The oil and meal is usually used in household consumption. The soy cake is a by-product of the soy oil consumed as animal feed in poultry and pig farming. The two sub-products account for the economic viability of soybeans, 2/3rd for oil and 1/3rd for the meal (Thoenes, 2013). The soy oil is valued as the second most important vegetable oil from palm oil but there is a chance this might change due to the increasing demand for soy meal and cake.

Despite soy oil being the second from palm oil in the vegetable oil market, it dominates the international oil seed market consisting of 54% of the world’s total oil seed production (NAMC, 2011). The authors indicate that the production of soy oil in the world is mostly done in the United States, Brazil, Argentina and China.

The world oil stocks declined by 2.4% annually in 2000 to 2010 while the price of oil increased by 9.2%. Soy meal has been increasing annually in the same period at 0.8% and its prices growing at the rate of 5.3% annually (NAMC, 2011). This indicates how profitable soybean farming has become for most economies.

Most small scale farmers especially in Africa, do not produce the oil. Nigeria being the largest consumer of soybeans in Sub Saharan Africa uses soybeans as flour and milk substitute. IITA (2009), states that soybean farming is important to the African farming systems. It improves soil fertility adding nitrogen from the atmosphere. This is a major benefit for African farming systems as most farmers lack fertilizer or cannot afford it. Especially since more production is needed as population increase (IITA, 2009).

## 2.2 Soybean Economy and Market Structure

According to Thoenes (2013), the value addition of soybeans occurs at downstream stages of the production and processing chain. Soybean farmed is directly consumed as food at the small scale levels while on the larger scales, industries in different countries receive it in bulk for further processing. The author further indicates that, this brings about the economic importance of soybeans. In that, there is a creation of two separate economic activities; the direct consumption and the downstream transformation, export and marketing of the end products.

IITA (2009) indicates that there were 212.6 million tonnes of soybeans produced from the 95.2 million hectares of soybeans that were harvested worldwide. Thoenes (2013) further elaborates that the growth rate of soybeans increased by 5% per year on average with 82% of the global output coming from Argentina, Brazil and the United States. These countries were followed by China, India and Paraguay with 13% global output and the rest, 5% being from the rest of the world including Africa. He also indicates that Africa and Asia (excluding china) who have a lot of food insecurities only account for 5% of soybean total output.

## 2.5 The African Market

According to Kolapo (2011), Africa’s soybean production cannot match up with her demand. US$ 1 billion in 2004 was spent to import soybean and soy oil in Africa. US$752 million and US$254 million was for soybean oil and soybean grain/meal respectively (IITA, 2008). By increasing soybean production, most African countries will reduce on the cost of importing.

ACET (2013) asserts that small scale farmers with less than 5 hectares are the ones that produce soybeans in the sub-Saharan Africa. The demand is mostly driven by the poultry and livestock producers. This has prompted the demand for soybeans causing a large pool of importation.

Cameroon produced 39 thousand metric tons of soybeans from 2005 -2009 but did not produce soy oil or cake. Thus, they imported 20 and 60 thousand metric tons of soy oil and cake respectively. The import value of 15.7 and 28.7 million US dollars for the oil and cake was incurred (ACET, 2013).

NAMC (2011) also indicates that, 94% of the soybean oil consumed in South Africa is imported from United States, Brazil or China. On the other hand, Cameroon imported 100% of its soybeans oil and cake (ACET, 2013). Shurtleff & Aoyagi (2009) identifies Nigeria, South Africa and Uganda as the highest producers of soybeans with 39%, 35% and 14% respectively. *See appendix 1*.

According to the areas suitable for soybean farming as stated by IITA (2008), Africa is far from reaching its maximum potential in the production of soybeans. The sub-Saharan Africa accounted for only 0.7% of global production in 2008(ACET, 2013). This includes Cameroon whose Northern area is excellent for soybean farming but currently it is importing soybean products from Belgium a country that does not even cultivate soybeans (Ngochembo, 2010).

Figure 1: Soybean suitability map for Africa



*SOURCE: IITA (2008)*

## 2.3 Challenges and Risks in Soybean production and Commercialization

According to IITA (2009), there are constraints in soybeans production that have deterred its growth. These range from the production stage to commercialization. The main reason for the low average yield of soybeans is the lack of dual-purpose variety of seed for African farmers (FAO, 2011). The seed production and distribution among African soybean growers is poor which has reduced the increase of production.

Soybean is a farm crop that can bring about loses during production before the product can even reach the market. 50-60% yield loss can occur due to the plant being attacked by diseases such as rust and bright disease. In 1999, Cameroon among other African countries like Nigeria experienced the rust diseases which reduced the production of soybeans (IITA, 2009). The lack of research on seed quality is also one of the constraints. African countries lack the facilities for R&D for better seed as most seed pods shatter in dry savannah environments (Mbaya, 2011).

The farmers in most rural areas also lack the adequate knowledge and skills to cultivate the soybeans in the proper way and minimize the loss of seed before harvesting. After harvesting, there is still unavailable equipment for processing in many African countries (IITA, 2009; FAO, 2011).

Many soybeans farmers in Africa are discouraged to increase the production of soybeans because of the lack of market for the grain. FAO (2011) indicates that the poorly organized processing and marketing channels for soybean has caused African farmers not to attain the expected income. Most farmers lack available finances especially since there are high transportation costs to access good markets. IITA (2009) adds on to say that poor market for soy grain has also induced lack of interest among farmers. In addition to this, most household do not know how to prepare the crop for consumption.

The issue that has risen in increasing of soybeans production is deforestation. Brazil is an example that has been affected by deforestation due to the increase of soybean cultivations. Soybean plantations have been growing into the amazon rainforest for new soy farms including infrastructure to support the expansion (Tanever, 2013).

The agriculture minister of Brazil, Antonio Andrade attributed the increase in soybean farming to the increasing prices of the crop. He announced at a harvest opening event in Mata Grosso that approximately 196.3 million tons of grain were expected that season from Brazil increasing the Brazil Agribusiness GDP by 4% in 2014. He aligns the success with the practice of vertical integration which helped in transforming and creating a large hub in the Agribusiness.

### 2.4 Soybean Sustainability

Despite the deforestation caused by soy farming, the minister celebrated that the soybeans harvested is expected to surpass that of the United States (Farmers Futures, 2014). What prompted the increase is aligned with the practice of better farming methods.

Brazil came up with solutions that could help in maintaining the amazon forest from soybean expansion. An article published by Tanever (2013), states that if Brazilian farmers stopped clearing new areas for soybean cultivation by just shifting land used for grazing animals instead, deforestation would be avoided. This sets out a future warning to other countries especially in Africa that deforestation as soybean farming is increasing can be avoided by shifting grazing land.

As inclement weather over the years is hampering soybeans production in countries like United States and Brazil, this opens future opportunity in countries like Cameroon which are characterised with good farming weather suitable for soybean farming (IITA, 2009). If the bad weather increases in these areas, there would be need for the countries with good weather conditions to export. Cameroon should be well prepared to seize such an opportunity.

Kolapo (2011) further identifies soybeans as Africa’s ‘Cinderella’ crop. As noted earlier most African nations are characterised by malnutrition, and soybeans is the best most affordable source of protein which prevents impoverished health especially for children.

Soybeans sub products are not just profitable products but have been proven to improve health and reduce diseases. According to the Food and Drug Administration (2009) the low cholesterol content reduces heart diseases and the high protein reduces malnutrition especially in African countries were other protein sources are relatively costly.

This can be used as a marketing strategy to create awareness about soybean products to consumers. Kotler & Armstrong (2012), outline two types of promotional strategies that can be used when marketing and selling products. Push is where one uses representatives to sell products or brands while pull strategy creates a demand vacuum that pulls the product through the chain. Pulling consumers to demand products can be the best strategy for modern marketing (Stamoulis, 2006).

## 2.6 Soybeans Production: Business Strategies

Michael Porter (1985) describes the value chain as a range of strategic activities of customer value prepositions from their conception to delivery of final product, evaluating the costs and value incurred by the company along the chain (Cheong, 2011).The creation of a soybean value chains has been used by many organisation aiming at increasing soybean production. AgriDynamic has developed its own soybean value chain. *See in appendix 2.*

The value chain shows that Cameroon has two main actors who purchase soybeans. These are the end consumers and the poultry farmers who are supplied by retailers and farmers. This is considered good as ACET (2013) outlines demand from the poultry sectors as one of the success drivers for soybean production. The farmers play a critical role in the supply of soybeans. If the inputs like seed are not of quality, the loss would affect the entire supply chain. There are also other institutions involved like the government that help in importing soybeans from Belgium (Ngochembo, 2010).

South Africa (NAMC, 2011) also developed a similar value chain but went on further to indicate the role of the international activities mostly importation of soybeans into South African. Considering the NAMC value chain and the AgriDynamic value chain, both can create a business model that would consolidate aspects of their value chains. This could be advantageous in increasing production and reducing the cost of importation.

In Ghana, soybean production has been promoted by the ministry of Food and Agriculture. Their aim was to help increase cash income and improve the nutritional status of rural households. This would help in marketing of soybeans to both the farmers and consumers of soybeans (ACET, 2013)

The productivity of soybeans highly depends on the production at the farming stage. To minimize costs caused by poor harvests, there is need for the dissemination of technical information to farmers (ACET, 2013).

### 2.6.1 Effectiveness of Value Chain

Lora Cecere contributor of Forbes (2014) outlined that not all value chains developed are effective or efficient. They can end up being a cost if not properly implemented. Thus, a business model can be developed and used as a road map for the operations of soybean business. It would help identify the sources of revenue, intended customers, products and financial details. Osterwalder & Pigneur (2010), define a business model as the rationale of how an organization creates, delivers, and captures value. They developed a nine building block that would help any organisation develop an effective business model.

Osterwalder & Pigneur (2010) illustrates how the four basic components of a business would guide a company in developing an effective business model. The business canvas identifies four components namely customer, offer, infrastructure and financial viability covered in nine building blocks. This would then act as a strategic blueprint. If implemented through good organizational structures, processes, and systems they would effectively and efficiently help the organisation produce the right thing, at the right place and time for the right consumers.

The creation of value being the focal point in any business (Kotler & Armstrong, 2012; Collier & Evans, 2009), and because a customer would choose an offer from a company that delivers more value than others- a business model is essential. It would help the organisation to step by step identify the value prepositions sought by customers at the most efficient cost helping in achieving a competitive advantage.

This is validated by the soybean president of the association of soybeans (Aprosoja) in Brazil Glaiber Silveria. He states that the productivity of soybeans was limited by the poor supply chain which was out-dated and if modernized, soybean production would increase by 20% (Tanever, 2013). Thus they created an initiative and model that allowed vertical integration and created a business hub that helped bring fourth better productivity of soybeans. Vertical integration accordingly to Collier & Evans (2009), is the process of acquiring and consolidating elements of a value chain to achieve more control. Another example would be The National Initiative for Sustainable Agriculture, NISA.

### 2.6.2 NISA Business Model

NISA developed a business model that is deemed to prompt continuous sustainable agriculture. The objective of the model is to make farmers feel that they are not being tested but supported to develop new and existing agricultural projects suitable for their regions (NISA, 2012).

The NISA business model does not clearly outline the various elements in a value chain but outlines how to integrate business activities. To identify the components of the value chain, Osterwalder & Pigneur business model is more effective. By building on these two models, a consolidative business model can be developed and value chain integration can be achieved. This will be in such a way that the management of information, physical goods, and services ensures the availability of soybean products at the right place, time, cost, quantity and with the highest attractive quality (Collier & Evans, 2009).

Figure 2: NISA Business Model

New/existing initiatives

VALUE

CHAIN

Educate

Harmonize

Validate

New/existing tools &

Mechanisms

*Adapted from NISA (2012)*

According to fig 4, the model aims at educating farmers through identifying and communicating sustainable outcomes and indicators. The next step the organisation takes is to collaborate with stakeholders in the supply chain. They establish consensus on the appropriateness of the outcomes and indicators. This are set as consistent principles to be used by many stakeholders. This would then lead to the acknowledgement of emerging crops with region specific sustainability initiatives from the farmers. It shows how this business model later flows in perfectly with the value chain to make it more effective and efficient.

## 2.7 Success Factors

ACET (2013) identifies three main key opportunities that would help African soybean producers increase soy production. The first is the catering of the domestic market in order to reduce imports. The second is to target growth markets for soybeans like the poultry and human consumption sectors. The last but most important is to reduce soybean production costs to attain cost-competitiveness. Inasmuch as attaining cost effectiveness is important, there are also other factors that prompt the success of any business model. For example, quality control which is important in attaining competitive advantage. It helps create satisfaction and product loyalty throughout the supply chain.

# CHAPTER THREE

# *Research Methodology*

## Introduction

This chapter outlines the ways that were used to collect and analyse the data of the research. It looks at the research design used, the sampling procedure, the research tools, mode of administration, the data analysis technique that was used and how it will be presented. Last but not least, it also outlines the limitations of the research.

## 3.1 Research Design

Research design is the blueprint and general plan of how the research questions will be answered (Saunders et al. 2009). This portion justifies the research strategy that was used and the research choices made to fully answer research questions and meet set objectives. Robson (2002) indicates that to choice the best research strategy, it should be guided by the research questions. Through the research questions, the following research design, collection technique and analysis procedure was selected. The research used both the exploratory and descriptive research design.

Exploratory research design was used to ensure that the problem is fully understood and to help gather prior knowledge on reasons why there is low productivity of soybeans. This research design helped in finding out the current situation. Secondary data- that is prior company literature on soybeans was studied to help give insight of the problem. At the same time, some informal interviews was conducted on soybean farming through experts to help in coming up with a more reliable and valid survey.

The descriptive research design was used to amplify on the exploratory research (Saunders et al. 2009). It gave a clearer picture of what the farmers were facing that was limiting them to produce more soybeans. It also amplified more on what they thought could be done to help them increase productivity. This helped portray a more accurate profile of the farmers and the situation at hand.

The final part of the research questions was to discover the best model and approach that could be used by AgriDynamic and the farmers so as to improve the productivity of soybeans. To answer this, secondary data on soybeans farming and production was collected and primary data was gathered from farmers, suppliers and retailers. Institutions that supported soybeans production were interviewed. Last but not least, the organisations representatives were interviewed informally to find out their limits and potential.

## 3.3 Data Collection Techniques

To further answer the questions on the challenges and risks being faced by the farmers and find out what the organisation should emphasize upon in their soybean farming training program, primary data was collected. Semi-structured interviews were conducted where farmers were interviewed personally. According to Peter and Donnely Jr. (2007), primary data is the best to use to specifically answer research problems being investigated. This helped in collecting reliable data on the; who, what, how much and how many questions in the research (Saunders et al. 2009). The prior authors also indicated that the survey method selected was the best for exploratory and descriptive research design.

The data was personally collected by the researcher and another representative of AgriDynamic with expertise in Agriculture. The representative also helped in the translation as most respondents spoke the local dialect.

The personal interviews were used to induce accuracy of data collected. It also allowed the researcher to gather more information beyond what the questionnaire asked and increased the response rate. The data was collected from May to June.

## 3.4 Sampling Procedure and Sample Size

To draw a more reliable conclusion over the population, a sample of 120 respondents was arbitrarily selected by the company supervisor which was used to effectively collect the primary data. Due to time and financial constraints, 100 farmers were interviewed from Bamessing where the organisation is located. The 20 other respondents were for the agricultural delegates of the area, the suppliers and retailers based in the nearby towns, Ndop and Bamenda. The areas targeted were purposively chosen using the judgement of the expert in Agronomics and AgriDynamic representative.

Non-probability sampling was used in selecting the sample, of which the convenience and judgemental method were applied to select the respondents. This helped in avoiding time and resources on unwilling respondents. The sample of farmers, suppliers, retailers and institutions was also based on an experts opinion on what was the best area to target for soybean production.

## 3.5 Data Presentation and Analysis

Quantitative and qualitative analysis were used to analyse the data collected. By using both methods, it gave a higher chance of getting an objective and conclusive solution. Thus a mixed method was used, where quantitative and qualitative techniques were utilized. In such a way that quantitative data was qualitised and qualitative data was quantitised (Saunders et al. 2009). The use of multiple methods for data collection and analysis procedures in answering research questions in Business and Management Researches was also advocated by Curran and Blackburn (2001) as stated in Saunders et al. (2009).

By using the different methods for data collection techniques and data analysis, it helped cancel out the method effect were different results result due to the application applied. This helped lead to greater confidence in the conclusions that were made.

The questionnaires and interviews were based on closed and open ended questions with a five point scale question. The researcher used Microsoft Excel to analyse the data. Charts and frequency tables were utilised to present the analysed data.

The data collected and analysed was compared with available secondary data from available literature to help assess the extent of the challenges being faced. Through this, more conclusive answers for the research questions were developed.

## 3.6 Limitations of the Study

The research was limited by the language barrier which forced the researcher to have a translator of which some of the data might have been lost within the translation. Despite that, having a translator allowed the researcher to gather more information from respondents. To avoid loss of information due to the translation, the researcher repeated some on the question. The time and resources also limited the research to a specific area of the North-Western province of Cameroon. Being restricted to a specific area allowed the researcher to spend sufficient time on each respondent.

## 3.7 Ethical Issues

Usually respondents prefer information not being disclosed but during the process of collecting the data, most respondents asked and allowed the researcher to gather their names for the company data base. No ethical issues were violated.

# CHAPTER FOUR

# *Research Findings*

## 4.0 Introduction

The chapter gives the research findings as found in chapter three. It gives a description of the data collected based on the three questionnaires administered to the 100 farmers, 15 retailers/suppliers and 5 institutions.

## 4.1 Description of the sample

Among the 100 farmers, 85% were female and 15% were male. It showed that more women were involved in soybean farming than males. Figure three shows the gender differences of soybean production in Ngoketunjia region.

Figure 3: Farmers in Ngoketunjia Region

Majority of the farmers ranged from the age of 36-45 years with 34% followed by the age group of 46-60 years who were 31%. The youth accounted for 18% and 9% for age groups 36-35 years and 16-25 years respectively. The lowest was the elderly that were 61 years and above who accounted for 8% of the farmers. Figure 4 shows the different age groups of the farmers.

Figure 4: Age Groups of Soybeans Farmers

The 8 retailers and 7 suppliers were interviewed from three locations namely Bamessing, Ndop and Bamenda. 67% were female while 33% were male. 87% run the small scale business in the market areas solely while 13% have extra jobs as the run their business. Most of the retailers and suppliers sold other farm products like grounds, different varieties of beans, palm oil, coco yams while some operated grocery stores. Similary to farmers, majority of the retailers and suppliers were female with most of them running their small scale businesses fulltime.

Five institutions were interviewed. Four from the Ministry of Agriculture and rural development (MINADER) in the four locations and one that produced soybean products based in the regions city. MINADER has no soybean farmers registered at their institution. They indicated that it was a ‘Work in Progress’ and are hoping with the Agricultural census for 2015 they will have statistics of soybean farmers. In the same way, the fifth institution-Beneficial Natural Foods had no formal registered soybean farmers. The farmers that supplied soybeans to the institution were based on non-contractual agreements.

## 4.2 Production of Soybeans

Table 1 shows that 59% of the farmers got the capital from finances within their family coffers, 40% got from cooperatives while 1% of the farmers used its subsidiary to finance for the production of soybeans. The cooperatives consisted of groups within the different quarters in the village. These quarters were divided into female and male meetings. The groups contributed money that is borrowed by different individuals to fund for the farming. A micro finance organisation called MC2 which is now closed down due to financial problems had previously assisted 3% of the farmers to finance for soybeans production. 2% accounted for private daily savings made among colleagues.

Table 1: Sources of Funding for Soybeans Farmers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Source of Funds | Family | Cooperatives | Sponsor | Total |
| Percentage | 59% | 40%  (Mc2-3 ;Daily Savings-2 ) | 1%  (Business Partner) | 100% |

Figure 5 below shows that 14% of the farmers did not keep record of how much was used to finance for the soybean production. 61% majority capital ranged from 5,000 CFA to 25,000 CFA. These were followed by those that used 26,000- 50,000 CFA while 1% capital ranged from 101,000- 125,000 CFA. 3% of the farmers used above 126,000 CFA and from that 1% catered for the highest capital of 950,000 CFA.

Figure 5: Funding of Soybeans Production

The institutions currently do not have any support system for soybean farmers. Most of the farmers use casual labour to run their soybean farms. The main input cost is the purchase of fertilizer. Of the 46% farmers who purchased inorganic fertilizer, 76% bought 50Kg bags of fertilizer at an average price of 20,000 CFA while 24% bought 25kg bags of fertilizer at an average price of 10,000 CFA. Figure 8 shows the fertilizer usage.

It takes 1-2 weeks for the farmers to cultivate their land. 6000m2 surface area was cultivated. 50% cultivated 100- 399m2 while 30% cultivated 400-699m2. 14% cultivated above 100m2 and the lowest of 4% belonged to those that cultivated 700-999m2 of soybeans. 2% of the farmers did not know how much land they used for cultivating soybeans.

Production targets are estimated but not recorded. Only 15% managed to meet their expected production targets but 85% failed. The area the farmers cultivated produced 14, 328kg soybeans. This production level was based on all the soybean farmers that used inorganic and organic fertilizer including those that did not use fertilizer.

### 4.2.1 Fertilizer Usage and Production Yield

54% of the farmers that used inorganic fertilizer used two types of fertilizers called NPK 201010 and Urea on a ratio of 1:1. 46% of the farmers either did not use fertilizer as some of them applied organic fertilizer from animal droppings. Figure 6 shows the percentage of those that used fertilizer and those that did not.

Figure 6: Percentage Use of Fertilizer

Table 2 shows that from the 14, 328Kg of soybeans produced, 48.8% was produced by those that used inorganic fertilizer and 51.2% was produced by those that did not use inorganic fertilizer and those that used organic fertilizer. [[1]](#footnote-1) It shows that the 54% farmers that used inorganic fertilizer still produced 2.4 % less than those that did not use it. This shows that, soybeans being a nitrogen fixing legume does not indeed need that much of inorganic fertilizer as compared to other crops.

Table 2: Quantity of Soybeans Produced

|  |  |  |  |
| --- | --- | --- | --- |
| Measure | Fertilizer Users | Non Users/ Organic Manure | Total |
| Bucket | 388.5 Buckets | 407.5 Buckets | 796 Buckets |
| Kg | 6993 | 7335 | 14328 |
| % | 48.8% | 51.2% | 100% |

### 4.2.2 Procurement of soybeans by Retailers/Suppliers

The retailers and suppliers stated that they purchased the soybeans from three locations in Cameroon. They purchased from Ndu in the North-West region in July, Magda in the western region in December and those that could not fund for transportation purchased from the local suppliers in Bamenda. They stated that they incurred a lot of costs finding the farmers and transporting the soybeans.

## 4.3 Marketing and Sales

Only 37% of the soybean produced by the farmers was sold. Table 3 shows how much was sold from the quantity produced. 63% of the soybean produced was used for household purposes, mainly for human consumption and animal feed. Most of the farmers produce for household purposes instead for commercial purposes. The reason stated was because they found it difficult to sell the soybeans and ended up using it at home.

Table 3: Soybean Quantity Produced and Sold

|  |  |  |
| --- | --- | --- |
| Measure | Quantity Produced | Quantity Sold |
| Kg | 14328 | 5319 |
| Percentage | 100% | 37% |

Compiling all the uses inclusively, 44% farmers used soybeans for household consumption, 39% sold the soybeans commercially, and 13% used it for animal feed while 4% kept some for seed. Figure 7 shows the details.

Figure 7: Uses of Soybean Produced

Figure 8 below shows the percentages of the farmers and how much of the soybean was used for household purposes, commercial purposes, animal feeding and seed. The estimated measure was a quarter, 2 quarters, 3 quarters and 4 quarters respectively.

Only 2 % solely produced for commercial purposes while 4% solely produced for household consumption. 20% of the farmers sold a quarter of the soybeans produced, 7% sold half while 10% sold three quarters of the soybean produced. 19.5% used a quarter for household consumption, 12.5% used half while 8% used three quarters. All the farmers kept an insignificant amount of the soybeans for seed but 3.7% of the farmers kept a quarter for seed while 0.4% kept half. For animal feed, 7.4% farmers used a quarter, 4% used half while 1.4% used three quarters. The animal feed is home made using the local grinding meals. None of it is tested. The farmers use assumptions on the quality of the soybeans produced and processed.

Figure 8: Soybean Quantity Used

### 4.3.1 Packaging and Pricing

Table 4: Retail Quantity & Prices (Franc)

|  |  |  |  |
| --- | --- | --- | --- |
| Product | Quantity | Farmers Prices (CFA) | Retailer/supplier Prices (CFA) |
| Soybean | 100kg | 27,800 | 36,000 |
| 20kg | 5,560 | 7,200 |
| 10kg | 2,780 | 3,600 |
| 5kg | 1,390 | 1,800 |
| Soymeal | 1kg | - | 1,000 |
| Soybean Flour | 1kg | - | 1,200 |
| Soybean Tea | 500g | - | 1,600 |
| Soy Pap | 500g | - | 875 |

Packaging is mostly done in sack bags and buckets. The bags/sacks stated refer to 100kg labelled bags of which when filled with soybeans would weigh 126kg. The 20 litres labelled bucket when filled with soybeans weighs 18kg. 15% of the farmers used the 100kg bags when selling soybeans while 85% used the 20 litres bucket to sell the soybeans.

Table 4 shows the wholesale and retail prices for soybean products. The farmers sold 100kg soybeans at 27,800 CFA, 20kg while the retailers/suppliers sold it at 36, 000 CFA. The farmers did not sell any other soybean product apart from the grain itself. Retailers/suppliers had other soybean products like soybean meal and flour which was sold at 1000 CFA and 1200 CFA per kg respectively. Soybean tea and pap were sold at 1,600 CFA and 875 CFA per 500g respectively.

### 4.3.2 Distribution

The farmers that sold soybean, used two modes of selling inclusively. 39% farmers retailed the soybeans produced while 71% wholesaled it. The farmers, retailers and suppliers sold from stalls in their local markets. Only 1% of the farmers and 13% of the retailers/suppliers had stores within the market area.

Figure 9: Retailers/Suppliers Reach of Key Customers

Figure 9 shows 75% of the suppliers and retailers depend on informal marketing of their soybean products to consumers who visited their stalls at the local market place. Beneficial Natural Food was the only that went a step ahead by employing a sales representative to sale and advertise its products. This shows that both the farmers and resellers do not have a well-organized market for soybean.

## 4.4 Factors Limiting the Increase of Soybean Production

The farmers stated that they faced a lot of challenges that have hindered them from increasing soybean production. These challenges faced are in two stages. The first is the production stage which starts from the cultivation to processing for final product. The second is the marketing stage which involves the selling and distribution of the final product. The following are the hindrances and challenges the farmers, retailers/Suppliers and institutions stated as factors that limited the increase of soybean production.

### 4.4.1 Production Stage

The lack of proper tools to cultivate and process the soybeans into end products was stated as one of the reasons that reduced the increase in soybean production. Manual labour was mostly used increasing the production time and slowed down the entire cultivation process. Soybean that was produced got destroyed by moulds due to lack of proper storage facilities and drying materials like tarpaulins in the rainy season.

The respondents stated that they did not have adequate finances to purchase the tools and inputs needed for farming and processing soybeans. The lack of fertilizer was one of the reasons that farmers stated that limited the increase in soybean produced. The harvested soybeans also got to be eaten up by snakes in the fields and rodents due to poor storage facilities.

The famers, retailers/suppliers and institutions stated that the lack of technical knowledge and skill was a major factor that prevented the increase in soybean production. Most farmers did not know the right type of seed, soil and fertilizer to use or how to treat diseases that attacked the plant. They used instincts and estimations as compared to the knowledge they had on other crops like maize.

Institutions indicated that the current traditional farming method called mixed cropping[[2]](#footnote-2) limited soybean yields. They indicated that no research is being done currently on seed variety. The institution called IRAD had stopped research on soybeans. Farmers lost a lot when planted seed did not germinate causing huge production losses. Poor seed variety also caused losses before harvesting. The farmers stated that they lost grains in the filed because of the poor variety of seed which had plant ports that cracked open before they were harvest. This caused massive loss as grain is hard to pick from the ground due to their small size and colour.

Quality Control by the farmers is based on manual selection of the available grain. They do not have any approved measure to test the soybean produced. They considered the brighter coloured and bigger grain to be of superior standard but this is not entirely true. Monsato an American multinational Agrochemical and Agricultural biotechnology corporation sheds more insight on seed variety and quality on its website AgAnytime. According to AgAnytime (2014), seed appearance does not affect the quality of the seed produced. Perfectly looking seed can produce low quality soybeans while seed that seems flawed can produce very high in quality soybeans. What would not germinate is seed that is cracked.

The suppliers and retailers also used chokers[[3]](#footnote-3) to check soybeans before buying but ultimately, visual observation was their standard of measure for quality*.* Only Beneficial Natural Foods took its seeds for laboratory testing in Yaoundé and USA.

### 4.4.2 Marketing Stage

The farmers indicated that soybean was not easy to sell as other farm products they sold like maize. Most institutions in their location did not offer buying soybeans from them like they did for products like maize and rice. Finding customers on their own stopped them from increasing production. To make matters worse, they including the retailers and suppliers stated that customers had a high bargaining power forcing them to sell at low prices. This entail forced them not to realize the returns on finances spent during production.

The slow return rate as compared to other crops was stated as one of the reasons they produced less of soybean. Lack of local transportation (handcart) from the farm area to market place also hindered the farmers from producing more. The retailers and suppliers faced high transportation costs to locate soybean farmers and resorted to selling more of other farm products they could easily access.

The farmers, retailers, suppliers and institution stated the following risks that hindered the increase in production. Lower yields than expected which have reduced returns. The lower yields were mainly caused by unexpected seed not germinating, unforeseen diseases affecting the plant and rodents and snakes eating the grain reducing quantity produced.

The farmers stated that even if they would produce more soybeans there was still that uncertainty when it comes to funds to buy inputs like fertilizer. The institutions indicated that the uncertainty of financial assistance for soybean farmers from external organisations was also due to the low supply of the crop. The farmers, retailers and institutions aligned this to the fear of low sales.

Fear of low and poor sales was one of the reasons they stated that hindered them from producing and buying more soybeans for sale. The low turnover was attributed to the lack of good organized market channels. This forced the farmers to divert to other legumes crops that they could easily sell.

Products and Packaging

The farmers only sold the soybean grain while the suppliers and retailers sold three main products, Soybean grain, Soybean cake/meal and Soybean tea, flour and pap. 93% of the suppliers and retailers sold soybean grain except for Beneficial Natural Foods which sold international standard packaged products like soybeans tea, flour and pap.

67% of the retailers and suppliers do not repackage the soybeans. The customers came with their own bags unless they purchased the whole 100kg bag. Those that sold home-made soybean meal repackaged into small plastic sachets which were manually sealed. Beneficial Natural Foods, one of the suppliers is the only one that does international standard packaging. The packaging is bought from china.

## Services and External Support

There is no institution that is providing formal assistance to farmers with regards to soybeans production. 97% of the farmers have not received any external organisational help for the production of soybeans while 3% received some financial assistance from MC2 which closed down. 100% agreed to organisational assistance. Of which, 22% had no preference on what type of organisation they preferred but 58% preferred NGO’s, 19% government while 1% preferred a private company.

The institutions have not yet collaborated with other organisations when it comes to soybeans production due to the low production of soybeans but have done so with other farm products. For instance UNVDA collaborated with MINADER for the rice production. Beneficial Natural Foods has not effectively worked with other organisations because the ones that come by, seek to buy them out. The institutions stated that they were willing to collaborate with other organisations in increasing the production of soybeans.

## Conclusions Drawn from the Factors Below: Farmers, Suppliers/Retailers & Institutions

The 100 farmers, 15 retailers/suppliers and 5 institutions were given factors to rate on a five point scale from very bad to very good. 60% considered the available seed quality to be very good while 10% considered it bad. 62% considered the climate and soil to be very good while 2% said it was bad. 39% said that the quantity of soybeans was average while 32% said it was bad. 60% found it difficult to process the soybeans while 11% said it was manageable. 66% stated that the potential profitability of soybeans production was promising and 1% said it was very bad. Table 5 gives their views.

Table 5: Conclusions Drawn from the Factors Below: Farmers, Suppliers/Retailers & Institutions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Factor/ percentages(%) | Very Bad | Bad | Average | Good | Very Good | Non Response | **Total (frequency)** |
| **Quality of seed** | 0 | 10 | 16 | 60 | 12 | 2 | 12O |
| **Acceptable condition (climate/soil)** | 0 | 2 | 5 | 41 | 62 | 0 | 120 |
| **Quantity of soybean produced** | 1 | 32 | 39 | 25 | 3 | 0 | 120 |
| **Quality of the soybean produced** | 0 | 5 | 22 | 62 | 11 | 0 | 120 |
| **Ease of processing the soybeans** | 9 | 60 | 17 | 11 | 2 | 1 | 120 |
| **Potentential profitability of soybean farming/production** | 1 | 2 | 10 | 21 | 66 | 0 | 120 |

Majority of the respondents rated the factors above favourably. This shows that most of them have a positive attitude and are willing to increase the level of soybeans produced. What was rated unfavourable is the ease of processing the soybeans from production to the time it is commercialized. If this is minimized and solved, it will be advantegeous in attracting more farmers and resellers for soybeans.

# CHAPTER FIVE

# *Discussion and Conclusions*

## Introduction

The research objective was to find the best way that AgriDynamic can implement to help increase the production of soybeans for local farmers in Ngoketunjia. By looking at the different challenges and risks the farmers, retailers, suppliers and institutions face, the researcher identified strengths, opportunities, weaknesses and threats they could optimize, avoid and minimize upon. *See Appendix for AgriDynamic SWOT analysis.* By looking at the SWOT, the best strategic approach in increasing soybean production profitably can be developed.

## 5.1 SWOT Analysis

Strengths and Opportunities

AgriDynamic is a well-known organisation by the farmers. 71% of farmers knew AgriDynamic and only 29% did not know AgriDynamic. Despite that, 100% were willing to be registered with AgriDynamic and join their training program. With the willingness of the farmers, AgriDynamic is placed in a position to easily implement its business model with less resistance. AgriDynamic already has a positive corporate image among the farmers and institutions. This would act as one of their strengths when implementing the soybean value chain.

Currently there is no organisation providing any initiatives for increasing soybean production profitably which gives AgriDynamic a head start in a market with no competitors. With the high importation costs of soybean as stated in chapter three, soybeans creates a domestic market that needs to be satisfied. With 94% farmers willing to increase soybean production, both the organisation and the farmers stand to gain profitably. Soybean has become an economic viable product with health benefits.

AgriDynamic already has self-motivated qualified staff and an Agronomist that will ensure that the soybean value chain is efficiently and effectively implemented. MINEDA representative, the sub-divisional delegate, indicated that he would also work with the AgriDynamic soybean program voluntarily.

According to the FAOSTAT data it shows that the harvested area was 13 500 hectares in 2012 in Cameroon while the research showed that only 6 hectares of the surface area in Ngoketunjia was being utilised for soybean farming. This shows that there is more land that can be used to increase the production of soybean. They will not even spend a lot in reaching the key customers. According to the findings, 75% of customers are reached at the local markets which are the central places where everyone meets. Each market day has a specific day and is easily accessible.

Weaknesses and Threats

Improved seed for soybeans, lack of knowledge and inadequate finances for fertilizer where the major indicators for the low production for low production. With 85% farmers having failed to reach their targets there is a possibility of this trend in future. This can be a setback in implementing the value chain effectively. AgriDynamic can turn this weakness to their advantage by using their skilled staff to educate the farmers and also provide improved seed.

AgriDynamic is not entirely financially self-sufficient and mainly depends on donor funds. This prevents them from providing direct finance to farmers for fertilizer support. On a positive angle, soybean is a nitrogen fixing legume that is able to extract nitrogen from the ground. It has been proven to need less fertilizer. According to the agricultural representatives from the institutions, 100% of them stated that there has been cases were fertilizer usage caused the plants to grow but the plants did not produce grains. This would reduce the input costs needed for soybean farming as less fertilizer will be used.

Moreover, the data collected showed that the farmers that used fertilizer were more than those that did not use it. Yet, the ones that did not use fertilizer still produced a higher yield than those that used fertilizer.

In a nutshell, the best way forward is for AgriDynamic to organize the farmers in such a way that they collaborate together. With a well-organized structure, they can register farmers to the organisation. Their objective would be to set up readily available technical knowledge for farmers. After the farmers have produced the soybeans, they should be able to provide the market for them. This would take care of the pricing and distribution problems currently disadvantaging the farmers.

The business model below will demonstrate how AgriDynamic can help farmers produce more soybeans. By providing the technical knowledge and spear heading the supply chain, they can motivate the farmers in producing more.

Figure 10: AGRIDYNAMIC BUSINESS MODEL

Educate

New/existing initiatives

VALUE

CHAIN

AGRIDYNAMIC Implementation

Harmonize

Validate

New/existing tools &

Mechanisms

Educate: AgriDynamic’s task is to look at the current challenges the farmers face and try to minimize them. AgriDynamic can provide the platform were farmers have available knowledge for soybeans production. They can provide them knowledge on how to minimize production costs ultimately reducing costs along the value chain and supply chain.

Validate: The farmers have their local initiatives but lack the technical know-how on how to effectively and efficiently implement the ideas. AgriDynamic’s objective would be to validate the farmer’s current practices with the international accepted practices. This would include quality control, packaging and better pricing methods.

Harmonize: AgriDynamic will act as the central hub for all the farmers registered with them. They would have the responsibility of ensuring that the farmer’s soybean products have a market and are priced at the right price. Thus, they would bring farmers together and help them collaborate as one. This would allow them to take advantage of economies of scale reducing individual costs when purchasing inputs like fertilizers, insecticides and herbicides. Ultimately it would also help in controlling quality produced by the farmers.

Thus, they will bring together the existing practices of farmers to work hand in hand with the new tools and mechanisms surrounding soybeans. These new practices developed would then conform to the acceptable market standards.

The reason why there is low soybean yield is the slow sales experienced by both the farmers and the suppliers. If AgriDynamic takes care of the marketing and distribution of the soybeans, the rest will fall in place. Lack of finance was stated as a hindrance but provision of direct finance to farmers would not solve much. The best way would be the creation of new non-financial initiatives. Firstly, AgriDynamic can provide a readily available market for all farmers who produce an extra hectare of soybeans. This would motivate the farmers to produce more.

Secondly, AgriDynamic can contact all the suppliers and retailers that are forced to travel long distances for soybeans. By selling the soybeans to them profitably, they would spend less and reduce transportation costs. Thirdly, this would mean that the consumers would buy the product at a lower price prompting more sales.

Implementation

The value chain has got three main components, production, marketing and sales and services which will be all covered in the AgriDynamic business model. By educating the farmers through trainings and providing technical knowledge, this would reduce production costs enhanced by poor farming practices. AgriDynamic will be the hub that brings the farmers together reducing operation input costs through bulk buying.

Marketing and sales are critical in the value chain. Without the customers or easy access to the customers this delays the whole chain. The objective is to have the soybeans delivered to the customers and the right time and place in the quantity and quality sought. Most farmers do not have the time to look for customers. If AgriDynamic provides a readily available market, it would motivate the farmers to produce more.

AgriDynamic would help ensure that the quality sold meets the acceptable standard to avoid losses at the selling points. They would provide after sale services between the suppliers/retailers and the farmers. This includes information support between the farmers and the institutions.

Currently there is no institution supporting soybeans production. The institutions indicated that they are not able to reach out to farmers individually. Through AgriDynamic the institutions would be able to reach the farmers easily for support and other external services. AgriDynamic would be able to provide a consistent principle and framework acceptable in the market that incorporates solutions to enhance soybeans production. The above business model does not identify the stakeholders and components from production to commercialization of the soybean products. To take this into account, the business model canvas will be used.

## 5.2 The Business Model Canvas

The business model canvas has got nine building blocks. According to the data collected, the following make up the nine building blocks for AgriDynamic. *See appendix for AgriDynamic business model canvas.*

The main customers for AgriDynamic soybean business structure will be the farmers, retailers/suppliers and later on the poultry farmers. The data collected showed that there are more female farmers than male with majority ranging between the age of 26 and 60. AgriDynamic’s target group would be female farmers between the ages of 26 to 60. The farmers will supply the soybeans to the organisation. The organisation will then sell to suppliers and retailers. As time goes on, the poultry soybean section will be developed where the organisation will be able to process soybean cake for the poultry segment.

The organisation would provide training and a readily available market for them to sell soybean produced as yields increase. This would give retailers and suppliers easy access to quality soybeans reducing transportation costs. What would be created is a platform to make easier access to farmers and after sale services. Poultry farmers would be able to access local high protein soybean animal feed at lower costs than imported feed.

To deliver the above value prepositions, AgriDynamic will train the registered farmers at the training centre located in Bamessing. The farmers will be thoroughly supervised through the production of the soybeans. The soybeans produced will be sold to AgriDynamic who will sell it to suppliers and retailers at the right price and quality. With the processing equipment put in the, AgriDynamic will start processing soybean cake for animal feed to be sold to the poultry farmers.

Retaining the registered farmers through continuous technical support will motivate the farmers to produce more. AgriDynamic reaching the farmers entails them to reach out to the community as well. The community will be the 'heart’ of the business. Soybean campaigns will encourage consumers to consume more soybeans while building relationships along the value chain.

The core source of resources from this venture will be through sales of the soybeans by AgriDynamic to retailers and suppliers profitably. The next step will be to start processing of the soybeans to produce soybean cake for poultry farmers that will be sold at a lower price than the imported one. The minimization of production costs will help them attain competitive advantage over imported soy products. The pricing of the soybeans will be volume dependant to encourage farmers to produce more and the retailers/suppliers to purchase more.

Farmers indicated that they lacked the proper tools to farm soybeans. AgriDynamic can lease out tools to the farmers. Farmers can also pay subscriptions that will help them access improved seed, tools and loans at lower prices than prevailing market prices. To attain the organisation objectives, the key resources the will be the trainers and facilitators who will develop the most effective soybean curricula development program.

Currently only 14,328kg of soybeans is being produced which is less than 1% of the 118,000 tonnes Cameroon produced in 2012 (FAOSTAT, 2014). This shows that there is still potential of producing more soybeans in Ngoketunjia. AgriDynamic objective would be to help the farmer’s inverse the 37% soybeans being sold to the 63% being used for household consumption.

The farmers, retailers and suppliers indicated that the reason why they sold less was due to the lack of a proper market. If AgriDynamic core activities would be finding the market and customers for the soybeans produced, the quantity sold would increase.

AgriDynamic will be able to solve the farmer’s challenges to increase the sale of soybean profitably by developing an organised market linking farmers to retailers and suppliers. This would also entail well-set pricing mechanisms and quality control of the soybeans produced. The support services will include training of the farmers to reduce production costs.

The key partners for AgriDynamic would be qualified soybean trainers. They would be responsible in discerning technical knowledge to the farmers and checking for quality control at the production stage. MINEDA will link AgriDynamic to any government support regarding soybeans production.

AgriDynamic cost structure will highly be based on attaining economies of scale through bulk buying and selling to farmers and retailers/suppliers respectively. Economies of scope will also be vital when selling their soybean cake to poultry farmer. This will be done alongside AgriDynamic’s poultry section to minimize on costs.

# CHAPTER SIX

# *Recommendations*

## 6.0 Introduction

The chapter outlines the researcher’s recommendations to AgriDynamic so as to viably revamp the soybeans production. Implementing the business model shown in chapter five should be AgriDynamic first task. In order ensure it is also successful, the minimization of costs through cost sharing and bulk buying is vital. This is followed by the quality control of the soybeans pulled and pushed along the supply chain. The last would be the creation of a marketing and distribution network with reputable producers and suppliers.

## 6.1 Implementation of the Business Model

To increase the soybean production, AgriDynamic will have to implement the AgriDynamic Business model. The organisation should make sure that it sets soybeans standards for all stakeholders to use. The following are the key areas that AgriDynamic should take note of when implementing the soybean business model.

## 6.2 Starting a Training Program

AgriDynamic should set up a training program that will provide farmers with the right knowledge and skills on the best tools to produce and process soybeans efficiently. Development of a curricula training program for all registered farmers with AgriDynamic will help in the minimization of production losses by the farmers. They will acquire the skill and knowledge of the best farming methods to use. This would also include provision of improved seed. Registered farmers will be required to pay a subscription fee depending on the support required. The subscription fees will allow farmers access to finances, tools and other farming inputs at a lower cost. The collaboration of the farmers will help minimize costs by conducting activities in bulk to attain economies of scale and scope. *Appendix 7 has elements to be included in the training program.*

Medium of Communication

Communication about the soybean programs using company representatives will be the best way AgriDynamic can reach the farmers. There are different community meetings called ‘*njagi’s’* where farmers meet. The information presented to the farmers in the meetings will then disseminate through the village. The farmers will then come to the training centre requesting for more information. AgriDynamic’s task will then be to inform these farmers in detail about the program.

## 6.3 Harmonizing New/Existing Initiatives, Tools & Mechanisms

The creation of better farming methods incorporating farmer’s initiatives will help manage quality of the soybeans. AgriDynamic already has farms that can be used to test soybean seeds before they are planted. Having improved seed will help improve the quality of the soybeans. AgriDynamic will also have to set mechanisms for quality control that will act as standard principles for all the stakeholders. They can for instance encourage the farmers to practice mono cropping instead of mixed cropping.

They can also set up micro finance platforms for the farmers to have faster and affordable finances to fund for the expansion of soybeans. In addition to this, farmers can be organized in such a way that they purchase tools and other farm inputs like fertilizer and insecticides together.

AgriDynamic will have to be the market that links the farmers, retailers, suppliers and institutions together. They should be able to organize the marketing and distribution network in such a way that a satisfactory price is set for all stakeholders. This way, the consumers will not have a higher bargaining power than the farmers and resellers.

Creating awareness of soybean products will be essential. Buzz marketing can be used. This is where opinion leaders in the community spread the news of a product to others. In such, the organisation can select farmers that have an influence on the community. They can be the first to use the developed curricula program and with ascertained positive results, they can influence other farmers. This will increase soybean awareness.

The pull promotional strategy can be used to create more awareness among consumers. Ngkentunjia is a well-organized region with weekly community meetings among residents. This can work in minimizing promotional costs. Advertising can be done in the local community halls were women’s and men’s meeting are held for free. Majority of the soybean farmers being females, flyers encouraging the consumption of soybeans can also be made and distributed at local clinics. This is where mothers meet monthly for under-five check-ups.

The pull strategy will be able to induce the consumers to demand the product from the resellers who will demand it from the farmers encouraging them to increase production. This creates a demand vacuum that pulls the product through the chain. To motivate the farmers, AgriDynamic can set up a strategy which promises farmers the sale of soybeans for every extra hectare produced.

## 6.5 Making AgriDynamic the Marketing Hub

Step 1: Registration of soybean farmers

The organisation should also select key influential farmers to whom they can personally sell the soybean program. Each of these key farmers should be from the different targeted locations. Then they can set up a conference where the farmers will be informed about the soybean program and later on get registered. The task will be to follow them up through the ‘njagi’s’ and inform them about the soybean conference where they can get registered. With the key farmers already in support of the program, the other farmers will follow their lead.

Step 2: Buying of the Soybeans from Farmer

There are two options, farmers can take the soybeans to AgriDynamic or AgriDynamic can follow the farmers. The recommended option will be to set up dates at the community meeting places in each location where AgriDynamic can purchase the soybeans from the farmers. This will build customer relationships and show the organisations commitment to the farmers. They would then have to promise cash upon delivery to encourage farmers to bring forth the soybean.

Step 3: Resale of the soybeans

Prior, contacts of the suppliers and retailers is vital. Most of the suppliers and retailers are located in the market centres. They had a challenge of travelling distances to locate soybean farmers but with AgriDynamic at a central place, it would reduce their transportation costs. The organisation should then keep a database of the suppliers and retailers for easy communication and orders. AgriDynamic should also set up its own store but should not sell its soybeans at a lower price than the suppliers and retailers because that would bring conflicts.

Step 4: Aftersales Services

The institutions indicated that they have not assisted soybeans farmers because they are not collectively organized. They indicated that they are open for discussions. In this case, AgriDynamic will have registered the farmers but has to approach the institutions for any available external help. To be able to provide the farmers with training, financial help, tools and farming inputs, subscriptions can be collected. The organisation will provide micro finance for the farmer’s production at lower costs. Interests accumulated will be shared among farmers depending on the amount contributed.

## 6.6 Buying price and Selling Price

Based on the research the following are the market prices that can be the starting point for AgriDynamic to buy and sell the soybeans. The farmers produced an estimated quantity of 14, 328kg of soybeans which is about 143 bags of 100kg packaged soybeans. The market selling price that they can use is 27, 800 CFA per bag and they can resale at the prevailing price of 36,000 CFA. This will give a profit of 8,200 CFA per bag. The 143 bags would cost 3,975,400 CFA and the sales would be 5,148,000 giving them a profit of 1,172,600 CFA. This gives a profit of 29%.

To increase the profits, the quantity of soybeans should be increased to attain economies of scale which would reduce total costs and increase profits. If area cultivated is increased to a hectare, 238 bags will be produced. *Appendix 7 shows the cost of production per hectare.*

Based on the variable costs and fixed costs in appendix 7, the following economies of costs will be attained. Table 6 shows that as output units increase, the total costs does increase but the long run average cost per unit will reduce taking advantage of economies of scale.

Table 6: Economies of Scale

|  |  |  |
| --- | --- | --- |
| Output units in kg | Total costs (CFA) | Long run average cost per unit (CFA)[[4]](#footnote-4) |
| 143kg | 99,609 | 697 |
| 238kg | 122, 000 | 513 |

## 6.6 Long Term Recommendations

In the long run, AgriDynamic should start the processing of soybeans. The farmers and suppliers already affiliated with the organisation will be its first customers. The organisation can eventually start branding its own soybeans products that can compete on the international market.

When the soybean value chain is well established, AgriDynamic can form a cooperative where the farmers also own shares and are part of the decision making. This will empower the farmers and create long-term relationships. Thus, AgriDynamic will have 80% shares and the farmers 20% share.

## 6.7 Sustainability of Soybeans

Economic, social and environmental sustainability can be attained from increasing production of soybeans in Ngoketunjia. 80% of the soybean farming is done by females. This empowers them to contribute to household income increasing the consumption levels prompting economic development. Soybean is also used for consumption as it is cheaper compared to other proteins and it reduces malnutrition. Production and consumption of soybeans will reduce health problems which are a cost to the society increasing household income. It can also be a substitute for households that cannot afford more expensive protein like meat.

Soybeans is a nitrogen fixing legume and does not require a lot of fertilizer, this will also reduce production costs and increase profits. The concern that may arise may be deforestation. This can be avoided by shifting grazing land for animals instead of clearing new land for the soybean expansion.

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# APPENDIX

**Appendix 1: Fig 3. AgriDynamic Value Chain**



*Extracted from Ngochembo (2010)*

**APPENDIX 2: Soybean Production in Africa**

**Appendix 4: SWOT Analysis**

|  |  |
| --- | --- |
| STRENGTHS | WEAKENESSES |
| * Agronomist are already part of the staff * Skilled marketing and sales personnel * Runs a poultry section * MINEDA is willing to work hand in hand with AgriDynamic on voluntary bases. * Well-developed brand and corporate awareness among farmers. * AgriDynamic is already registered and operational organisation. | * No farmers registered with AgriDynamic * Most staff work on voluntary basis * Financial instability as organisation runs on sponsors funds |
| OPPROTUNITY | THREAT |
| * Soybeans is a viable economic product with health benefits * Optimizing on domestic market to reduce the high import costs * Readily available domestic market * Willingness of farmers to be registered with AgriDynamic * No competitors * No regulation restricting soybean production | * Possible entry of competitors * Lack of market information * Improper implantation of the value chain |

**Appendix 5: AgriDynamic Business Model Canvas**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Key Partners**  Soybean Farmers  MINEDA | **Key Activities**  Registration of Farmers  Developing a Training Curriculum  Buying of soybeans from farmers  Repackaging & Selling of soybeans to resellers | **Value Preposition**  Acquisition of Technical Knowledge & Skill  Easy Contact to Soybean Market players  Pricing and Quality control | | **Customer Relationship**  Dedicated Personal Assistance | **Customer Segments**  Soybean Farmers  Suppliers & Retailers |
| **Key Resources**  Trainers & Facilitators  Curriculum Development Team | **Channels**  Personal Selling  Own Store  Retailers & Wholesalers |
| **Cost Structures**  Fixed Costs  Variable Costs  (appendix 7) | | | **Revenue Streams**  Subscriptions from Farmers  Profits from sales of soybeans | | |

**Appendix 6: Elements to be placed in the Training Programme**

1. How to select better and improved seed. How to space the seed during planting
2. The proper way of using fertilizer and organic manure
3. How to effectively and efficiently use insecticides and herbicides. The type of chemicals that would suit soybeans.
4. Better way of harvesting so that the grains are not lost in the field
5. How to safeguard against animals (rodents and snakes)
6. How to process the soybeans in order to produce products like oil, milk, yoghurt and feed for animals.
7. Learning of the nutritious value of soybeans
8. How best to increase production and sales
9. How to generally grow soybeans to increase production and produce good yields (knowledge and skills)

**Appendix 7: Cost production prices & Gross Margin**

|  |  |  |  |
| --- | --- | --- | --- |
| Investment capital (IC) | Units | Unit cost | Total cost |
|  |  |  |  |
| Hoes | 4 | 6000 | 24000 |
| Cutlasses | 4 | 2500 | 10000 |
| Protective boots | 4 | 7000 | 28000 |
| Farm jacket | 8 | 3500 | 28000 |
| Rakes | 4 | 2000 | 8000 |
| Hand gloves | 8 | 1200 | 9600 |
| Bags | 20 | 500 | 10000 |
| Large sheet of materials for drying | 2 | 4500 | 9000 |
| Total IC |  |  | 126600 |
| Parameter | units | unit cost | Total cost |
| Gross output = total output\*unit cost |  |  |  |
| Total output per hectare | 930 | 300 | 279000 |
| **Variable cost (VC) per hectare** |  |  |  |
| Seed in kg | 70 | 750 | 52500 |
| Others |  | 5000 | 5000 |
| **Total VC** |  |  | **57500** |
| **Interest 19%** | **19** | **%** | **10925** |
| **Fixed cost (FC)** |  |  |  |
| Labor per person | 2 | 30000 | 60000 |
| Others |  | 5000 | 5000 |
| Total FC |  |  | 65000 |
| Interest on FC 19% |  |  | 12350 |
| **Gross Margin (GM) =GO-VC** |  |  | **210575** |
| **Net farm income (GM-FC)** |  |  | **133225** |

*Adapted from Ngochembo(2010)*

**Appendix 8: Questionnaire Guideline for Personal Interviews**

**The Implementation of the Value Chain Analysis for Soybean Farming**

**Main Question:** *what business model should be implemented to ensure that the soybean value chain is viable and sustainable for the local farmers and the organization?*

What conclusion would you make about the following?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| FACTOR | Very Bad | Bad | Average | Good | Very Good |
| **i) the quality of the soybean seed** |  |  |  |  |  |
| **ii)acceptable condition for soybean production** |  |  |  |  |  |
| **iii) preferred quantity of soybean produced** |  |  |  |  |  |
| **iv) the quality of soybean produced** |  |  |  |  |  |
| **v) the ease of processing the soybeans** |  |  |  |  |  |
| **vi) the potential profitability of soybean farming** |  |  |  |  |  |

**SECTION A: FARMER**

PRODUCTION

1. What challenges are faced during the planting of the soybean?
2. How have these challenges been solved?
3. How long does it take to plant the soybean?
4. Do you use fertilizer?
5. YES ,If yes,

What type?

What is the cost of the fertilizer per bag?

How many bags are needed?

1. NO, If No, Why don’t you use Fertilizer?
2. From your observation did you attain your production target last season?

YES, If yes what helped you manage to reach your target?

NO, If no, what do you think limited you to reach your target?

1. To what extent are you willing to increase production of soybeans for the next planting season?
2. Increase
3. Same as last season
4. decrease
5. What risks are involved in farming soybean?
6. How do you manage these risks?
7. How do you fund for the production of soybean?
8. How much of the soybean produced is for,
9. Household consumption?
10. Commercial purposes?

If (a) skip to question 12.

MARKETING AND SERVICES

1. If (b),
2. How do you package the soybeans?
3. How do you sell/market the soybean?
4. How much do you sell the soybeans for?
5. Approximately how much sales (units) did you sell?
6. Who do you sell to?
7. Who are your major competitors?
8. How much of a threat do the pose to your sales?
9. What challenges do you face?
10. How do you solve these challenges?
11. Have you received any assistance from other organizations for the farming of soybeans?

If yes,

1. Which organization assisted you?
2. What kind of assistance do you receive?

If no,

1. Would you like to be assisted?
2. In what kind of way would you like to be assisted?
3. What would you like put in place to help produce soybeans for commercial purposes?
4. Do you know AgriDynamic?
5. Would you like to join their training program?
6. If yes, what do you think should be placed in the training program
7. If No, Reason

**SECTION B: SUPPLIER/RETAILER**

1. How much soybean do you supply each year?
2. Where do you buy your soybean products?
3. How do you measure for acceptable quality?
4. What challenges do you face to ensure that you have the right type of soybean in the right amount?
5. What kind of soybean end product do you sell and how much do you sell it?
6. Do you repackage them? If yes, how do you package the soybean products?
7. How do you reach your key customers?
8. What kind of risks have you encountered with soybean marketing?
9. How have you reduced the mentioned risks?
10. What would you advice farmers to do to aid you as suppliers/retailers?

**SECTION C: INSTITUTIONS**

PRODUCTION

1. How many soybean farmers are registered with your institution?
2. What mechanisms have you put in place to aid the farmers in the production of soybean?
3. What have you established as the best way to help farmers to become more self -sufficient?
4. What challenges have you experienced when it comes to offering your services to soybeans farmers, suppliers and retailers?
5. How have you resolved these challenges?
6. What risks have you established so far when it comes to soybean production?
7. How has your institution managed to help minimize these risks?

MARKETING

1. What do you think farmers, suppliers and retailers should do to help your institution in its aim to increase the supply of soybeans?
2. Has your institution collaborated with other organization when it comes to boosting the supply of soybeans?
3. If yes, who have you collaborated with and what has been put in place?
4. What challenges did you entangle with the collaborations and how did you tackle them?

1. 20 litre bucket makes 18kg of soybeans [↑](#footnote-ref-1)
2. Mixed cropping is cultivating a crop within another crop. In this case it refers to cultivating soybean within the maize. [↑](#footnote-ref-2)
3. A chocker is a sharp pointed funnel that is used to pierce through a bag of packed soybeans to check the soybeans at the bottom of the bag. [↑](#footnote-ref-3)
4. Average cost per unit = output/total costs [↑](#footnote-ref-4)