Economic Feasibility of Producing Pasta in Kenya

by

George Warui

B.S., Kansas State University, 2009

A THESIS

Submitted in partial fulfillment of the requirements

for the degree

MASTER OF AGRIBUSINESS

Department of Agricultural Economics

College of Agriculture

KANSAS STATE UNIVERSITY

Manhattan, Kansas

2018

Approved by:

Major Professor
Dr. Tian Xia

ABSTRACT

Between the years 2008 and 2017, pasta imports in Kenya grew at a rate of 16.12%. This is from data obtained from Kenya National Bureau of Statistics. Growth is projected to continue and can be attributed to factors such as population growth which grew from 38 million to 50 million for that period of time. This population is projected to keep growing and double by the year 2050. GDP per capita grew 58% from US$ 916 to US$ 1,455 between the years 2008 to 2016. This has resulted to growth of middle-class families and increased their purchasing power. Changing lifestyles has led to increased number of dual-income families where both husband and wife work, creating food habits that call for fast and convenient foods.

Without domestic production, Kenya imports all its pasta. With the increased demand, it might be the right time for import substitution. This research seeks to find out if it is economically feasible to commercially produce and market pasta in Kenya. The research begins by simulating investment in a small scale pasta production plant in Kenya, followed assessing costs and revenues expected in the seven-year life of the investment. It involves starting up the plant, producing, marketing, and distributing the resulting pasta goods. It is funded through a Kenyan Shilling (Ksh.) 12 million loan from a local bank, payable in seven years at a 14% interest rate. From costs and revenues projections, cash flows are determined.

The project's feasibility is determined by evaluating the cash flows using both Net Present Value (NPV) and Internal Rate of Return (IRR) methods. Using the NPV method, the

project has a positive NPV of Ksh.1,286,282.00. When using the IRR method it has an IRR of 45% which is above the cost of capital. It is concluded that the project is feasible. It is also noted that both semolina cost (main pasta production raw), and pasta sales price are important feasibility drivers. NPV's sensitivity to both is therefore determined. From the analysis, the project remains feasible at all proposed pasta sales prices, as long as semolina cost does not exceed Ksh.56/Kilogram.

It is recommended that such import substitution projects be initiated in Kenya as the country would improve its financial well-being, fuel industrialization, reduce unemployment, as well as reduce over-reliance on imports.

TABLE OF CONTENTS

List of Figures ..... **vi**

List of Tables ..... **vii**

Acknowledgments ..... **viii**

Chapter I: Introduction **1**

1.1: Kenya Background 1

1.2: Pasta Background 1

1.3: Research problem 3

1.4: Research objective 3

1.5: Importance of the Research. 4

1.6: Layout of Research 5

Chapter II: Literature Review **6**

2.1: Kenya's Location 6

2.2: Kenya's Population 6

2.3: Kenya's Population Age Structure 7

2.4: Kenya's Economic Trends. 8

2.5: Global Pasta Production 9

2.6: Select Developing African Nations Pasta Production 10

2.7: Pasta in Kenya 11

2.8: Pasta Production Process 12

2.9: Project Management and Feasibility Study 13

Chapter III: Methods **15**

3.1: Market Assumptions 15

3.2: Plant Startup Operations 15

3.3: Pasta Production Operations 16

3.4: Plant Administration, Product Marketing, and Distribution 17

3.5: Project Financing 17

3.6: Pricing and Revenue Projections 17

3.8: Determination of Feasibility 18
CHAPTER IV: Results 19
4.1: Startup Costs 19
4.2: Operational Costs 21
4.2.1: Raw Materials Cost 21
4.2.2: Labor Costs 22
4.2.3: Power Costs 22
4.2.4: Packaging Costs 23
4.2.5: Facilities and Other Costs 23
4.3: Pricing and Revenue Generation 24
4.5: Financing 25
4.6: Cash Flow Statements and Feasibility Analysis 25
4.7: Feasibility Determination 27
4.8: Sensitivity Analysis 27
4.9: Results Analysis 30
CHAPTER V: Summary, Conclusion, and Recommendations 31
5.1: Summary and Conclusion 31
5.2: Recommendations 32
5.3 Limitations of the Study 32
5.4: Beyond Pasta 33
Works Cited 34

LIST OF FIGURES

Figure 2.1: Kenya's Historical and Projected Population 7

Figure 2.2: Kenya's per Capita GDP 1980-2016 9

Figure 2.3: World pasta production as of 2014 10

Figure 4.1: Breakdown of Pasta Production Costs 28

LIST OF TABLES

Table 2.1: Kenya's Populations Age Structure 8
Table 2.2: Kenya Pasta Imports 2008-2016 12
Table 4.1: Seven Year Projected Pasta Production 19
Table: 4.2: Pasta production equipment cost breakdown 20
Table 4.3: Total Plant Startup Costs 21
Table 4.4: Labor Costs 22
Table 4.5: Total Monthly and Yearly Production Costs 23
Table 4.6: 2017 Kenya Pasta Imports Value 24
Table 4.7: Projected Seven Year Prices Revenues 24
Table 4.8: Loan Amortization 25
Table 4.8: Projected Seven Year Cash Flow Statement (Ksh.) 26
Table 4.9: Sensitivity Analysis 29
Table 5.0: Pasta Retail Prices in Kenya (2018) 30

ACKNOWLEDGMENTS

I would like to express my sincere appreciation and gratitude to my major advisor Dr. Tian Xia for his patience, guidance, motivation, and friendly advice during this MAB project. I could not have imagined having a better advisor and mentor.

I would also like to thank the rest of my thesis committee members: Dr. Keith Harris and Dr. Brian Coffey for their support, insightful comments, and thought-provoking suggestions on issues relating to this project.

I cannot find words to express my gratitude to my employer U.S. Durum milling for their valuable support throughout the MAB program.

I am also thankful to the faculty and staff of the K-State MAB program led by Dr. Allen Featherstone.

Last but not the least, I owe my deepest gratitude to my family for being there for me, and supporting me throughout my life. To the younger generations, may this work inspire and remind you that you can accomplish anything you put your mind to.

CHAPTER I: INTRODUCTION

1.1: Kenya Background

Kenya is located in East Africa sharing land borders with Tanzania, South Sudan, Somalia, Ethiopia, and Uganda. Having a sea port on the south end gives it open access to the Indian Ocean making it a key regional player in East Africa, and also a major communications and logistics hub. This location advantage favors Kenya in terms of trade. According to the World Bank, Kenya had an estimated population of about 48.5 million in 2016. Its population has doubled in the last 25 years and will grow by around 1 million per year over the next 40 years to reach about 85 million by 2050 (Bank 2018). Consumer goods consumption in a country is directly proportional to its population; the higher the population, the higher the consumption. This population growth trend means that with time, Kenya food needs will keep growing.

Per capita GDP can be used to assess the standard of living in a given country, hence determine its citizen's purchasing power. According to the latest World Bank statistics, Kenya's GDP per capita was US$ 1455 in 2016, up from US$ 697 in 2006. This was a significant growth experienced within a span of 10 years (Worldbank, GDP per capita 2018). This growth is reflected by growing consumer purchasing power in Kenya and has led to an increase in consumer's taste of new consumer goods and foods. The above information makes Kenya a conducive business environment with great emerging, and sustainable investment opportunities.

1.2: Pasta Background

Pasta is a processed food originally from Italy. It is processed from dough made from wheat semolina and water, then extruded into various shapes and typically cooked in boiling water. Industrial pasta production history dates back to 1740 in the city of Venice

where Paolo Adami, was granted the license to open the first pasta factory (IPO 2018). Pasta is attractive as a food because it possesses the following desirable attributes:

- It is considered as a healthy food.
- It is easy and convenient to prepare.
- It is made from wheat and therefore sustainable.
- It is economically affordable.
- It has long stable shelf life, easy to store with low waste.
- It can be consumed together with a variety of other foods or sauces.
- It has little or no variance in taste from region to region.

Pasta consumption in Kenya dates back to the colonial times when it was introduced by European colonialists and settlers. Since then, pasta consumption in Kenya has had notable growth. According to data gathered from Kenya National Bureau of Statistics, pasta imports in Kenya had an average annual growth rate of 18.77% between the year 2008 and 2017 (KNBS 2018). Since Kenya does not produce its own pasta, we can assume that most, if not all the imports were locally consumed. This growth is projected to increase and can be attributed to the following:

- Population growth which grew from 38 million to 50 million for the same period of time, and is projected to keep growing and double by the year 2050. Kenya population demographics also shows that over half of the country's population is aged 24years or below. This youthful population is more likely to divert from the traditional corn based diets to more "modern" wheat based diets such as pasta that fits into their tastes and preferences.

- Growth of GDP per capita which grew 58% from US$ 916 to US$ 1,455 between the years 2008 to 2016, resulting to growing middle-class families and increased purchasing power.
- Changing lifestyles such as increased number of dual income families where both husband and wife work therefore introducing food habits that call for fast and convenient foods such as pasta.
- Increase in use of Internet, social media, and advertising, which has exposed younger consumers to tastes and preferences of other people across the world. This has caused a rise in demand of foreign foods such as pasta.

1.3: Research problem

Between the year 2008 and 2017, pasta imports in Kenya grew at a compounded annual growth rate of 16.12%. In 2017, 39,984,845 Kilograms of pasta worth Kenyan shillings (Ksh.) 1.8 Billion (Equivalent to about US$ $17 Million) was imported in Kenya. With lack of local production, pasta imports will continue to rise. Importing comes with economic liabilities resulting from procuring, shipping, taxes, and other fees incurred. In turn, these financial liabilities are passed on to consumers hence making pasta diets less accessible, and expensive in Kenya. This research examines the problem arising from increasing pasta demand coupled with lack of domestic pasta production in Kenya. On the other hand, this creates an opportunity to start a local pasta production plant in Kenya.

1.4: Research objective

Growth in pasta consumption in Kenya coupled with lack of local processing plant(s) provides an opportunity to manufacture pasta in Kenya. Keeping this in mind, the main

objective of this research is to determine if it is economically feasible to commercially produce and market pasta in Kenya as a way of reacting to the growing demand.

1.5: Importance of the Research.

This research explores an investment opportunity made possible through starting a pasta production plant in Kenya. As a future investor this research is important as it provides to me with a blue print towards my future investment goals. The same business model can also be replicated by other investors in Kenya who would likewise gain economically through value addition of the available agricultural raw-materials.

Kenya's government Vision 2030 is a national long-term development policy that aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030. Part of this vision aims at development of Small and Medium Enterprise (SME) Parks, Industrial and Technology Parks, and Industrial Manufacturing Clusters (GOK 2018). The general objectives of the SME parks is to harness local and international investment opportunities by establishing processing parks in strategic locations with rich raw materials hinterlands. Some of the specific objectives for the SME's are:

- To promote the development of Small and Medium Industries.
- To enhance value addition to natural and agricultural resources.
- To attract local and foreign investment.
- To facilitate transfer of technology.
- To promote productivity and competitiveness of enterprises.

This research is therefore important to the Kenyan Government as it seeks to breathe into life it's year 2030 vision.

Corn based diets are the main staple in Kenya. In recent years, increase in corn demand has caused rise in corn prices therefore increasing the cost of living and even creating political crisis in Kenya. This research is also important because producing pasta in Kenya might make it cheaper, more available, and hence bring it closer to becoming an alternative to traditional corn-based food diets in Kenya. This would reduce corn demand, reduce corn prices, and reduce the cost of living in Kenya.

1.6: Layout of Research

In this chapter, we have presented an overview of opportunities created by growing pasta demand coupled with lack of pasta processing plants in Kenya. In chapter two we give an overview of the country Kenya, history of pasta, global pasta developments, followed by an overview of pasta growth in Kenya. In chapter three we look at the possibility of producing pasta in Kenya. We explore theories, methods, and assumptions made when simulating pasta production in Kenya. In chapter four we develop results from the theory discussed in chapter three. We also determine the projects feasibility and also analyze the results in this chapter. In the final chapter, we summarize the research and also give further recommendations per the observed results.

CHAPTER II: LITERATURE REVIEW

2.1: Kenya's Location

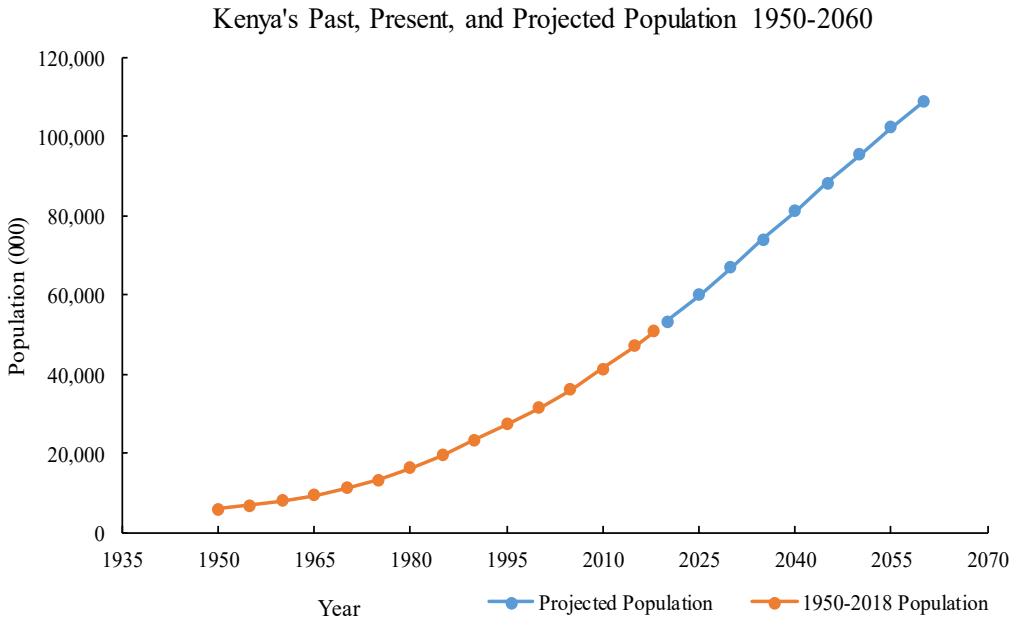
Kenya is located in East Africa sharing land borders with the countries Tanzania, South Sudan, Somalia, Ethiopia, and Uganda. It also has an important sea port on the south end which gives it open access to the Indian Ocean. This makes it a key regional player in East Africa, and a major communications and logistics hub (Bank 2018). Being a key regional player places Kenya strategically in terms of importing and exporting to and from other countries in the region. This advantage could favor import substitution and subsequent export of locally produced goods.

2.2: Kenya's Population

Consumption of basic human needs in a country is directly proportional to its population; the higher the population, the higher the consumption. It is therefore important to explore Kenya's population trends so as to be able to determine feasibility and sustainability of a pasta plant in Kenya. According to World Bank, Kenya had an estimated population of about 48.5 million in 2016. Kenya's population has doubled in the last 25 years and will grow by around 1 million per year over the next 40 years to reach about 85 million by 2050 (Fengler 2010).

Figure 2.1 shows Kenya's population trends with data obtained from www.worldometers website (Worldometers 2018).

Figure 2.1: Kenya's Historical and Projected Population



Source: www.worldometers.info/world-population/kenya-population/

As the graph on figure 2.1 shows, Kenya's population has grown tremendously since 1950's and is projected to keep growing and double by the year 2060. Such a growing population will only demand for more food, hence the need to prepare ahead by producing more food. Producing pasta in Kenya would help meet such growing food demands.

2.3: Kenya's Population Age Structure

More than 90% of the Kenyan population is below 54 years of age (CIA 2018). Figure 2.1 below breaks down Kenya's population into age-groups.

Table 2.1: Kenya's Populations Age Structure

Age Group	Representation
0-14 years:	40.02%
15-24 years:	19.15%
25-54 years:	33.91%
55-64 years:	3.92%
65 years and over:	3%

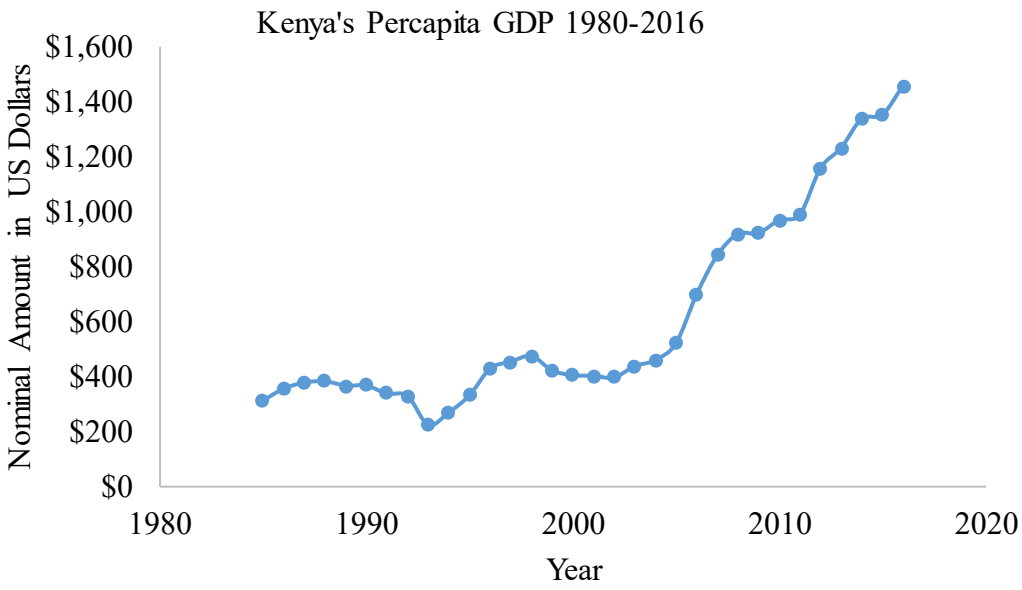
Source: www.cia.gov

From table above, we see that Kenya is a youthful country with more than half of the country's population being aged 24 years or below. With such a large, youthful population, Kenya needs to tailor future food demands to fit this group's tastes and preferences. Pasta production would fit into this groups future food demands.

2.4: Kenya's Economic Trends.

According to Investopedia, a country's Gross domestic product (GDP) is a measure of the total output of an entire economy, it approximates the income for the entire economy for a given period of time. Per capita GDP is calculated by dividing the GDP by the country's population. Per capita GDP can be used when assessing the standard of living in a given country hence determine its citizen's purchasing power (Investopedia 2018). It is therefore imperative to look closely and understand Kenya's per capita GDP trends so as to be able to study the feasibility of producing and marketing pasta in Kenya. As seen on the graph below on figure 2.2, Kenya is a developing nation and has had significant economic growth since the beginning of the millennium. Information from the World Bank, shows Kenya's 2016 GDP per capita at $1,455.4, and an annual GDP growth of 4.9% (Worldbank, GDP per capita 2018).

Figure 2.2: Kenya's per Capita GDP 1980-2016



Source: https://data.worldbank.org

GDP growth means higher purchasing power which gives consumers the financial ability to try out different goods and foods. This creates an opportunity of introducing a variety of consumer goods and foods into the Kenyan market.

2.5: Global Pasta Production

To understand this feasibility study, we need to have a good understanding of pasta. The word 'pasta' is the Italian for 'dough'. The usual basic ingredients of pasta production are wheat flour or semolina and water (Kill 2008).

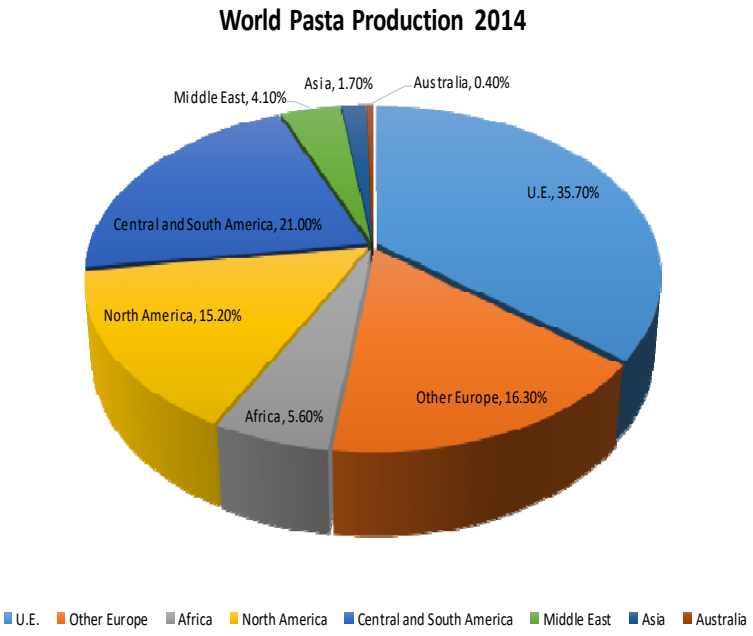
Industrial pasta production dates back to 1740 in Italy. In 1740, in the city of Venice, Paolo Adami, was granted the license to open the first pasta factory. A hundred years thereafter, in Amalfi, water mills and stone grinders started to be used, where the semolina was separated from the bran. The machines brought along with them the development of the market, skills and exports throughout the oceans. The great development of the Italian pasta at the turn of the century was tightly linked to exports, which reached a record level

of 70,000 tons, much of which was sent to the United States of America. Later on, importing countries started to produce machines to manufacture their own pasta products, and these managed to conquer the world (IPO 2018).

Pasta today is a food which is accepted and used all over the world at varying degrees of importance. It is also a sophisticated industry which now utilizes advanced technologies to maximize efficiency output and quality. It is a tribute to the technicians and engineers involved in these advances that they have managed to make production of this food cheap and plentiful without compromising on the quality (Kill 2008).

The following chart shows the world's pasta production as at 2014. Here we note that Africa only produced 5.60% of the world's pasta production.

Figure 2.3: World pasta production as of 2014



2.6: Select Developing African Nations Pasta Production

To help have a better understanding of pasta in developing countries in Africa, we will Nigeria as an example. Nigeria has had recent documented pasta production and

consumption growth in the last few years. To explore deeper, we can examine Olam Nigeria which is a subsidiary of Olam International. According to Wikipedia, Olam International is the third largest agribusiness in the world operating in 70 countries in the world (Wikipedia 2018). In its pursuit of new businesses in 2016, Olam Nigeria announced that it was going to invest US$275 million (Approximately Ksh. 27.5 billion) to acquire Amber Foods Limited which owns milling and pasta manufacturing assets in Nigeria. This acquisition was to strengthen Olam's position as the number two wheat miller by sales volume and make it a leading pasta player in Nigeria. Prior to this, Olam had acquired Nigeria Crown Flour Mills in 2010, and had established milling business in Ghana, Senegal, and Cameroon. Olam further states that pasta market in Nigeria was growing at 8% per year. This growth was attributed to population growth, increased in demand for wheat based products resulting from urbanization, change in tastes, convenience, and pasta becoming an affordable option of meeting carbohydrates requirements (Olam 2016). According to Mail and Guardian Africa magazine, Olam's packaged food operations in Nigeria, Ghana, and South Africa had current sales of US$350 million to US$ 400 million a year (Raghu 2016). The above information helps to highlight possibilities and potentials of the pasta market in developing countries in Africa.

2.7: Pasta in Kenya

Kenya does not produce its own pasta, it therefore has to import from the rest of the world so as to meet its pasta needs. It will therefore be assumed that Kenya's pasta imports match the demand/consumption. The following data sourced from Kenya National Bureau of Statistics collected between 2008 and 2017, and shows how much pasta was imported/consumed in Kenya (KNBS 2018).

Table 2.2: Kenya Pasta Imports 2008-2016

Year	Quantities Tons	Value in Ksh ('000)	Value US$ ('000)	Quantity Growth
2008	10,420.14	384,759.94	$55,762.31	
2009	12,306.04	384,759.94	$49,968.82	18.10%
2010	11,668.33	384,759.94	$48,703.79	-5.18%
2011	13,947.08	384,759.94	$43,231.45	19.53%
2012	21,533.74	384,759.94	$45,265.87	54.40%
2013	18,680.47	384,759.94	$44,739.53	-13.25%
2014	18,340.76	384,759.94	$43,722.72	-1.82%
2015	25,616.31	384,759.94	$39,261.22	39.67%
2016	25,034.14	384,759.94	$38,095.04	-2.27%
2017	39,984.85	1,832,649.74	$179,671.54	59.72%
			Ave Annual Growth	18.77%
			CAGR Growth	16.12%

Source: Kenya National Bureau of Statistics (www.knbs.or.ke).

From the table 2.2 above, we see that the quantities imported more than doubled within the nine year observation period. We note an average annual growth of 18.77%, and a compounded annual growth rate of 16.12% in the nine year period. We can also note that the Kenya pasta import market was worth Ksh.1.8 Billion (Approximately US$18 million) in 2017.

2.8: Pasta Production Process

Pasta is produced by mixing the raw materials water and semolina in a mixer to form a dough. From the mixer the dough enters an auger that kneads and exerts pressure on it as it moves down the barrel of the extruder to the die. The dough is shaped and cut into the desired size as it exits the die. The resulting fresh pasta still has high moisture and has to be dried before its ready for packing, storage, and shipping (Hoseny 1998). To achieve the goal of producing enough pasta in Kenya, the above process needs to be replicated commercially.

2.9: Project Management and Feasibility Study

Developing and implementing a project requires several resources to be identified, mobilized and applied effectively to work tasks throughout the project life. Project management is concerned with dynamic commitment of resources to ensure completion of the project. The first step in feasibility study is generation of ideas, which in turn depends on creativity, innovative nature or ingenuity. The project is systematically examined in depth at this stage for various aspects like market, technical, financial, economical, commercial, social, managerial, organizational and ecological analysis. Based on the feasibility report decision is taken whether project should be taken up, postponed or abandoned (Mishra 2005). In our case, commercial pasta production in Kenya will be studied to determine its economic feasibility.

The projects feasibility will be determined by evaluating the cash flows using both NPV, and IRR methods. Net present value (NPV) is the difference between the present value of cash inflows and the present value of future cash outflows over a period of time. NPV will be used to determine the profitability of the research project.

NPV is determined by the formula given below:

$$\text{NPV} = \sum_{t=1}^{T} \frac{CF_t}{(1+r)^t} - C_o$$

Where:

C_o = the total investment costs

CF_t = the net cash flow during period t,

r = discount rate, and

t = number of time periods

Using this method, an investment is deemed feasible if the NPV is greater than zero.

The IRR method (Internal Rate of Return) is the discount rate at which the NPV of the project's cash flows equal zero. Set the project's cash flows, discounted at the internal rate of return (IRR), equal to zero. It considers entire life of the project. It helps in assessment of the risk of the project (Investopedia 2018).

CHAPTER III: METHODS

This chapter looks at the theories that will be considered in simulating production and marketing of pasta in Kenya. As discussed in the last chapter, all pasta consumed in Kenya is imported. Importation comes with inconveniences such as time delays and financial costs that are eventually passed onto the consumer. To counter this we will consider a small business approach to commercial pasta production in Kenya. We will then determine if the investment is economically feasible under the current and projected pasta production and consumption trends.

3.1: Market Assumptions

This research uses the most current pasta import data as sourced from Kenya National Bureau of Statistics. Since there is no local production, imported pasta quantities will be assumed to equal market consumption for the product. An entry strategy to capture approximately 3% market share, with a projected growth rate of 7% for the life of the project will be assumed. The 3% market share fits into the project's design, which is ideally suited for a small business entrant with limited finances as opposed to large corporate businesses with solid finances. From the data and assumptions, we will determine the projects initial demand and its projected future demand hence determining the proposed plant's production capacity. The feasibility study projections will be done over a seven year period of time.

3.2: Plant Startup Operations

Startup of the proposed plant is set to commence in January 2019 with operations starting in February 2019. The project will involve importing pasta making equipment and machinery from China, and installing it in a rental warehouse the industrial area of the capital city Nairobi. Cost of the proposed equipment as quoted by the Chinese

manufacturing company is Ksh.6.8 Million. The equipment manufacturer will send a technician who will oversee equipment installation, test running, and training of the production workers. Two workers, a technician and an assistant technician, will be hired and trained by the expatriate sent by the equipment manufacturer. The plants location will be the industrial area of Nairobi Kenya which will is ideal because amenities such as water, electricity, internet, and phone are readily available. Trade and environmental licenses will be obtained at a cost discussed later. Importation duty and taxes will also be discussed later in the chapter. Manufacturing and packaging operations will commence soon after the plant is commissioned.

3.3: Pasta Production Operations

The proposed plant will produce 250 kilograms of pasta per hour. This translates to 100,000 kilograms per month when running for 16hrs a day and 25 days a month. This figure is approximately at the target of 3% of 2017's Kenya's pasta imports. The plant will be run by two technicians assisted by casual laborers from an employment agency as need arises. The main raw material (wheat semolina) will be locally sourced from local wheat milling companies. Semolina will be ordered as needed, and delivered into the plant in standard 90 kilogram bags. Average 2017 semolina prices will be used at the beginning of this project and a price increase of 3% per year will be assumed for the life of the project. Water which the other major raw material will be supplied by Nairobi Water and Sewerage Company at a cost of Ksh.64/ Cubic meter (NWSC 2018). Amount of water used per month will be assumed at 20% of the monthly budgeted pasta production. Power usage is estimated at 0.02Kilowatt hour per kilogram of pasta produced. Cost of power is estimated at Ksh.25/Kilowatt hour and projected to increase at 3% per year for the life of the project (Power 2018). Phone and internet services will be provided at a cost of Ksh.20,000 per

month and projected to go up by 3% every year for the life of the project. General transportation will be outsourced at a cost of Ksh.100,000 per month and is also be projected to grow by 3% every year for the life of the project. Outsourced general transportation services will be responsible for distribution of finished goods to the outlet stores. End-user products will be packed in 500grams (1/2 Kilogram) retail packages ready for the market.

3.4: Plant Administration, Product Marketing, and Distribution

Administrative duties including general plant management, procurement, accounting, finance, personnel management, and others will be handled by a plant manager. A plant technician, assistant plant technician, and two casual laborers will be responsible for the production and packaging operations. The marketing manager will be responsible for new business development, logistics, and management of product distribution channels. Finished goods will mainly be distributed through large retail stores that have outlets across the country. Other institutions such as schools will also be targeted. Labor costs will also be projected to go increase at the plants growth rate of 7% per year for the life of the project.

3.5: Project Financing

The project will be financed through a seven year Ksh.12,000,000 loan from a local bank at 14% interest rate. This loan covers the plant start-up costs, and part of the first month's operating expenses. It is assumed that the loan principle and interest will be paid at equal monthly payments for the life of this project. The loan will be used to cover initial startup costs plus two month expenses.

3.6: Pricing and Revenue Projections

The possible pasta sales price will be calculated from 2017 Kenya import data as obtained from Kenya National Bureau of Statistics. From this data, we can calculate the imported

pasta landing price per kilogram. To achieve this, we will divide the total 2017 pasta imports quantity by the total monetary value of the imports. To the calculated port landing price, we will then add the taxes payable, and a 20% markup assumed to cover for the importing company's expenses and profits. It is kept in mind that to compete with imported pasta brands, the assumed prices should be at or below the average 2018 Kenya pasta retail prices. Revenue generated per year will then be determined by multiplying the total amount of pasta produced by the determined sales price.

3.7: Licenses and Taxes

Import taxes will be accessed at 35% of the cost of the imported equipment. Revenue taxes will be paid at 30 % of the profits generated. Trade and environmental licenses will also be obtained from the Kenyan government as well as from the city of Nairobi.

3.8: Determination of Feasibility

After determining yearly costs and revenues, cash flows will then be developed and projected to cover the seven year life of the project. From the developed cash flows, feasibility will be determined by both IRR and NPV methods.

CHAPTER IV: RESULTS

In this chapter, data information from the previous chapter will be used to determine expenses and other financial obligations associated with producing pasta in Kenya. Amount of expected revenue from sale of goods produced will be calculated. A cash flow statement for the life of the project will then be made, and from this cash flow statement, the projects economic feasibility will be determined by both NPV and IRR methods.

4.1: Startup Costs

These are costs associated with plant startup operations which include, procuring the machinery and equipment, the installation, and test running it to ensure that products produced meet the expected specifications. The proposed plants capacity is 250kgs per hour which translates to 1,200,000kgs per year when running at 16hrs a day for 25 days a month. The seven year projected production is as shown on the following table.

Table 4.1: Seven Year Projected Pasta Production

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Production	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876

As shown above, the production rate of 1,200,000kgs is assumed for the first year, then projected to grow at 7% per year for the life of this project. At the projected growth, and with the plant running at 24 hours a day for 25 days a month, the plant will reach a maximum possible capacity of 1,800,000kgs per year in the seven year life of the project. Main equipment to be used to produce the projected quantities will be imported from China's Jian Saibainuo Machinery Co. Ltd. Table 4.2 below shows a breakdown of equipment prices as per a March 2018 quotation. The prices include freight charges from china to the port of Mombasa Kenya.

Table: 4.2: Pasta production equipment cost breakdown

No.	Machine	Quantity	Total Price USD	
1	Mixer	1	$	1,000.00
2	Screw Conveyor	1	$	1,500.00
3	Extruder	1	$	26,000.00
4	Cooling Tower	1	$	900.00
5	Cutter	1	$	2,600.00
6	Hoister	1	$	1,000.00
7	Five Meters Dryer	1	$	9,000.00
8	Hoister	1	$	1,000.00
9	Eight Meters Dryer	1	$	19,000.00
10	Cooloing Conveyor	1	$	1,800.00
	Total Price USD		**$**	**63,800.00**
	Total Price KSH			**6,380,000.00**

The equipment will be assembled by the equipment manufacturer's engineer who will also commission the plant and train the production staff in Kenya. As per the agreement with the supplier, we will provide room, board, round-trip transportation, and a nominal Ksh.5,000 daily for the engineer. Total costs to have the expatriate in Kenya is estimated at Ksh.300,000.00 Equipment transportation from Mombasa port to Industrial area in Nairobi will be estimated at Ksh.100,000.00 Costs to install the equipment will be estimated at Ksh.200,000.00 Importing the equipment will attract an import duty of 25%, Value Added Tax of 16%, and an Import Declaration Fee of 2.25% (KRA 2018). Total import duty, fees, and taxes calculated at 42.25% of Ksh.6,380,000.00 will be Ksh.2,661,750.00 A quality control laboratory will be set up for Ksh.200,000.00. Product packaging equipment will be acquired at an estimated cost of Ksh.200,000.00 Total start-up costs are estimated to be Ksh.9,961,750.00. The breakdown of start-up costs is as shown on table 4.1

Table 4.3: Total Plant Startup Costs

Item	Amount (Ksh.)
Pasta Production Equipment	6,300,000.00
Import Taxes @ 42.25%	2,661,750.00
Transportation	100,000.00
Installation	200,000.00
Expartriate Engineer	300,000.00
Lab Equipment	200,000.00
Packaging Equipment	200,000.00
Total (Ksh.)	**9,961,750.00**

4.2: Operational Costs

These are costs associated with the conversion process of turning the raw materials into finished goods that are ready for sale.

4.2.1: Raw Materials Cost

Wheat semolina is the main raw material for use in pasta production. Semolina made from durum wheat species is preferred for this product but it is not readily available in Kenya. As a substitute of durum wheat semolina, hard wheat semolina/farina that is readily available in Kenya will be used in the pasta production process. According to North Dakota Wheat Commission, 60 pounds of wheat (approximately 47 pounds of semolina) makes 42 pounds of pasta (NDWC 2018). With this information we can deduce that we will need 1.11 Kilograms of semolina to make 1 Kilogram of pasta. To produce our target amount of 100,000kgs of pasta per month, we will therefore need 111,000kgs of semolina. Average 2016 Kenya semolina prices will be used when calculating the cost of semolina used. The average 2016 semolina prices were estimated at Ksh.60.00 per kilogram. This amount will be used for the first year semolina cost calculations. A 3% per year price increase will be assumed for the life of the project.

Water, another key ingredient and will be supplied by Nairobi Water and Sewerage Company at a cost of Ksh.64 per cubic meter (NWSC 2018). Product water usage will be estimated at 0.0002 cubic meter per kg of pasta produced. This brings our monthly water cost to Ksh.12,800 which then brings us to Ksh.153,600 for the first year with a projected increase of 3% per year for the life of the project.

4.2.2: Labor Costs

Permanent pasta plant employees will include the plant manager, marketing manager, plant technician, and assistant plant technician. To start with, we will have two casual laborers provided by an employment agency. As the plant grows, or as need arises, we will add more casual laborers. Labor costs will be projected to grow at the plants growth rate of 7% per year for the life of the project. First year labor costs are broken-down as shown on the following table.

Table 4.4: Labor Costs

Position	Number	Monthly Salary	Yearly Salary
Plant Manager	1	40,000.00	480,000.00
Marketing Associate	1	35,000.00	420,000.00
Plant Technician	1	35,000.00	420,000.00
Assistant Technician	1	25,000.00	300,000.00
Casual Labor	2	20,000.00	240,000.00
Total (Ksh.)		**155,000.00**	**1,860,000.00**

4.2.3: Power Costs

Power to run the plant will be provided by Kenya Power and Lighting Company at the cost of Ksh.25 per kilowatt hour (Power 2018). It will be estimated that the plant will use 0.02 Kilowatt hours to produce a kilogram of pasta. This brings our first year monthly power

cost to Ksh.50,000.00 and a total of Ksh.600,000.00 for the first year which is also projected to grow at 3% per year for the life of the project .

4.2.4: Packaging Costs

Cost of packaging will be estimated at 40 cents per pasta carton box. Each carton box will carry half a kilo of pasta. Total number of boxes needed per month will be 200,000. Total monthly packaging cost will therefore be Ksh.80,000.00 and Ksh.960,000.00 for the first year and projected to grow at 3% per year for the life of the project .

4.2.5: Facilities and Other Costs

Facilities costs include rent, as mentioned earlier, the plant will be set up on a rental facility at a cost of Ksh.60,000.00 per month. Rent will be assumed to increase each year at 3% general inflation rate. General transportation is estimated at Ksh.100,000.00 per month, while phone and internet services are out-sourced at Ksh.20,000.00 per month. These too are assumed to increase at a general inflation rate of 3% per year for the life of the project.

Table 4.5: Total Monthly and Yearly Production Costs

Expense	Monthly Cost	First Yr Costs
Facilities Rent	60,000.00	720,000.00
Raw Material: Semolina	6,571,428.57	78,857,142.86
Raw Material: Water	12,800.00	153,600.00
Packaging Costs	80,000.00	960,000.00
Power	50,000.00	600,000.00
Labor: Administrator	40,000.00	480,000.00
Labor: Marketing Associate	35,000.00	420,000.00
Labor: Technician	35,000.00	420,000.00
Labor: Assistant Tech	25,000.00	300,000.00
Labor: Casual Laborer	10,000.00	120,000.00
Labor: Casual Laborer	10,000.00	120,000.00
Phone and Internet	20,000.00	240,000.00
General Transportation	100,000.00	1,200,000.00
Licenses	4,000.00	48,000.00
Total Production Cost (Ksh.)	**7,053,228.57**	**84,638,742.86**
Monthly Plant Capacity (Kgs)	**100,000.00**	**1,200,000.00**

4.3: Pricing and Revenue Generation

For the business to be competitive in the Kenyan pasta market, we will need to have our prices at or below the imported pasta prices. From the 2017 import data sourced from Kenya National Bureau of Statistics, we determined the average port landing price per kilogram of imported pasta to be Ksh.45.83 per Kilogram To this price, we added the average import taxes and tariffs payable (33.25%) and an assumed 20% mark up so as to come up closely with the minimum wholesale price that the importers can sell their goods and still make a profit. This is as shown in table 4.6 below.

Table 4.6: 2017 Kenya Pasta Imports Value

Imports	Amount in kgs	Value in Ksh	Value/kg	Value + 33.75% Tax	Calculated Sales Price
Total 2017	39,984,845	1,832,649,736	45.83	60.61	73

Ksh.73/Kg. will be used as the first-year sales price when calculating revenues generated by the project in the first year. It is projected that the prices will increase by 2% per year for the seven-year life to give the calculated revenues as shown on table 4.7 below.

Table 4.7: Projected Seven Year Prices Revenues

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Production (Kgs.)	1,200,000	1,284,000	1,373,880	1,470,052	1,572,955	1,683,062	1,800,876
Pasta Price/Kg (Ksh.)	73.56	75.03	76.53	78.06	79.62	81.22	82.84
Projected Revenue (Ksh.)	88,272,000	96,340,061	105,145,542	114,755,845	125,244,529	136,691,879	149,185,517

4.4: Taxes

Corporate revenue taxes in Kenya is assessed at 30% of the profit generated (KRA 2018). It will be assumed that this tax rate will remain the same for the life of the project. The taxable amount is calculated by deducting the yearly total costs from the yearly total

revenue. The difference between these two costs is taken to be the yearly profit and is subject to 30% revenue tax remitted to the government.

4.5: Financing

Financing will be through a local bank Ksh.12,000,000.00 loan payable in seven years at a 14% interest rate. The Ksh.12 million will attract an interest of Ksh.6,889,931.71 in the seven years. Equal monthly loan repayments of Ksh.224,880.14 per month will be paid for the life of the 7 year loan period. These payments cover both principal and interest charges. Table 4.8 shows the loan details and amortization.

Table 4.8: Loan Amortization
7 year Loan at 14% Interest Rate

Loan Principal (Ksh.)	12,000,000.00
Loan Interest (Ksh.)	6,889,931.71
Total (Ksh.)	18,889,931.71
Payment/ Month (Ksh.)	224,880.14
Payment/ Year (Ksh.)	2,698,561.67
7 year Total Payment (Ksh.)	18,889,931.71

4.6: Cash Flow Statements and Feasibility Analysis

From the projected yearly total costs and total revenues, a seven year cash flow statement is developed as shown on table 4.8 below.

Table 4.8: Projected Seven Year Cash Flow Statement (Ksh.)

Seven Year Projected Cach Flow Statement (Ksh.)

	2019	2020	2021	2022	2023	2024	2025
Annual Production (Kgs)	**1,200,000.00**	**1,284,000.00**	**1,373,880.00**	**1,470,051.60**	**1,572,955.21**	**1,683,062.08**	**1,800,876.42**
Annual Growth Rate	**7%**						
Bank Loan	**12,000,000.00**						
Production Expenses							
Facilities Rent	720,000.00	741,600.00	763,848.00	786,763.44	810,366.34	834,677.33	859,717.65
Raw Material: Semolina	78,857,142.86	86,908,457.14	92,992,049.14	99,501,492.58	106,466,597.06	113,919,258.86	121,893,606.98
Raw Material: Water	153,600.00	169,282.56	181,132.34	193,811.60	207,378.42	221,894.90	237,427.55
Packaging Costs	960,000.00	1,058,016.00	1,132,077.12	1,211,322.52	1,296,115.09	1,386,843.15	1,483,922.17
Power	600,000.00	661,260.00	707,548.20	757,076.57	810,071.93	866,776.97	927,451.36
Labor Permanent Staff	1,620,000.00	1,733,400.00	1,854,738.00	1,984,569.66	2,123,489.54	2,272,133.80	2,431,183.17
Labor: Casual Laborers	360,000.00	385,200.00	412,164.00	441,015.48	471,886.56	504,918.62	540,262.93
Phone and Internet	240,000.00	247,200.00	254,616.00	262,254.48	270,122.11	278,225.78	286,572.55
Transportation	1,200,000.00	1,236,000.00	1,273,080.00	1,311,272.40	1,350,610.57	1,391,128.89	1,432,862.76
Licenses	48,000.00	49,440.00	50,923.20	52,450.90	54,024.42	55,645.16	57,314.51
Total Production Costs	**84,638,742.86**	**93,189,855.70**	**99,622,176.00**	**106,502,029.63**	**113,860,662.06**	**121,731,503.47**	**130,150,321.62**
Other Costs							
Plant Startup Costs	9,961,750.00						
Loan Repayment	2,698,561.67	2,698,561.67	2,698,561.67	2,698,561.67	2,698,561.67	2,698,561.67	2,698,561.67
Total Costs	**97,299,054.53**	**95,888,417.38**	**102,320,737.67**	**109,200,591.31**	**116,559,223.73**	**124,430,065.14**	**132,848,883.30**
Revenue	**88,272,000.00**	**96,340,060.80**	**105,145,542.36**	**114,755,844.93**	**125,244,529.16**	**136,691,879.12**	**149,185,516.87**
Profit Before Tax	**(9,027,054.53)**	**451,643.42**	**2,824,804.68**	**5,555,253.62**	**8,685,305.42**	**12,261,813.98**	**16,336,633.58**
Tax	**-**	**135,493.03**	**847,441.40**	**1,666,576.09**	**2,605,591.63**	**3,678,544.19**	**4,900,990.07**
Profit After Tax	**(9,027,054.53)**	**316,150.40**	**1,977,363.28**	**3,888,677.54**	**6,079,713.80**	**8,583,269.79**	**11,435,643.50**
Cash Flows	**(9,027,054.53)**	**451,643.42**	**2,824,804.68**	**5,555,253.62**	**8,685,305.42**	**12,261,813.98**	**16,336,633.58**

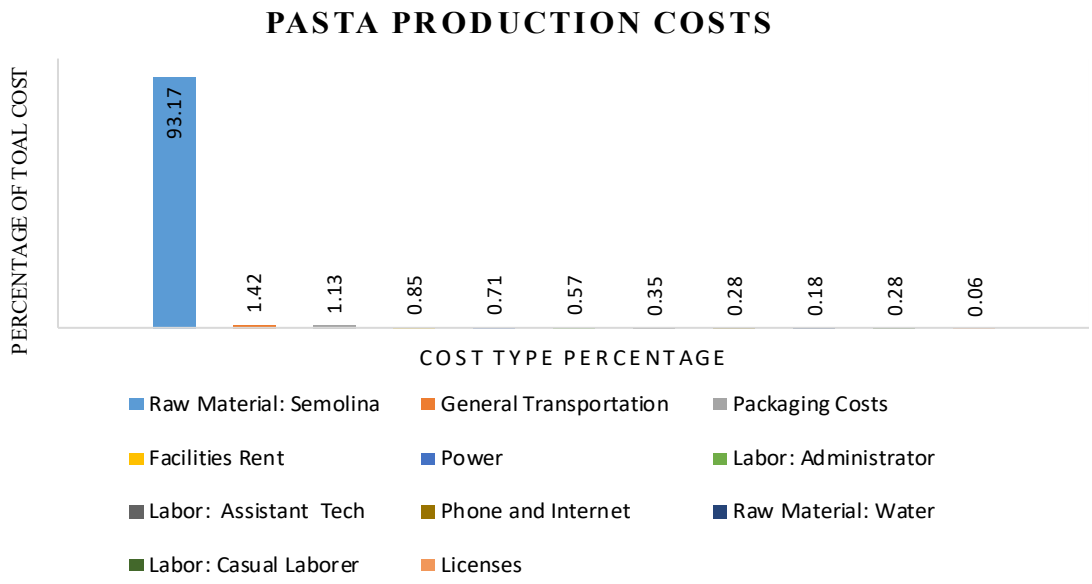
4.7: Feasibility Determination

The projects feasibility was determined by evaluating the cash flows using both Net Present Value (NPV), and Internal Rate of Return (IRR) methods. NPV is the difference between the present value of cash inflows and the present value of future cash outflows over a period of time. NPV was used to determine the profitability of the investment project over the seven year research period. A 15% hurdle rate was preferred as it was above the 14% investments loan interest rate. Using the NPV method, a project is accepted if the NPV is greater than zero, and rejected if it has a negative NPV. Our project had a positive NPV of Ksh.1, 286,282.00. It can therefore be concluded that the project is feasible using the NPV method. The internal rate of return is the discount rate at which the NPV of the project's cash flows equal zero. For the project to be considered feasible using this method we need the project's IRR to be above our cost of capital. Our cost of capital is estimated at 14%. Using the IRR method our project had an IRR of 45% which was above the cost of capital; it was therefore concluded that the project feasible.

4.8: Sensitivity Analysis

In this project, it is noted that the projects profitability is mainly driven by costs and revenue. On the costs part, it was noted that semolina cost (main pasta production raw material) accounted for more than 90% of the total pasta production costs as shown on figure 4.1

Figure 4.1: Breakdown of Pasta Production Costs



It can also be noted that that the only variable that we can easily change as a way of increasing or decreasing the revenues is the pastas sales price. For the above reasons, a sensitivity analysis to determine NPV's sensitivity to both semolina cost and pasta sales price was developed. The results of this sensitivity analysis are as shown on table 4.9

Table 4.9: Sensitivity Analysis

NPV	1,286,282
IRR	45%
Hurdle Rate	15%
Semolina Cost	60.00
Sales Price	73.56

		Semolina Cost										
	1,286,282	50	52	54	56	58	60	62	64	66	68	70
Pasta Sales Price	70	45,658,409	32,314,133	18,969,858	5,625,582	(7,718,693)	(21,062,969)	(34,407,245)	(47,751,520)	(61,095,796)	(74,440,071)	(87,784,347)
	75	77,047,806	63,703,531	50,359,255	37,014,980	23,670,704	10,326,428	(3,017,847)	(16,362,123)	(29,706,398)	(43,050,674)	(56,394,950)
	80	108,437,204	95,092,928	81,748,653	68,404,377	55,060,101	41,715,826	28,371,550	15,027,275	1,682,999	(11,661,277)	(25,005,552)
	85	139,826,601	126,482,326	113,138,050	99,793,774	86,449,499	73,105,223	59,760,948	46,416,672	33,072,396	19,728,121	6,383,845
	90	171,215,998	157,871,723	144,527,447	131,183,172	117,838,896	104,494,621	91,150,345	77,806,069	64,461,794	51,117,518	37,773,243
	95	202,605,396	189,261,120	175,916,845	162,572,569	149,228,294	135,884,018	122,539,742	109,195,467	95,851,191	82,506,916	69,162,640
	100	233,994,793	220,650,518	207,306,242	193,961,967	180,617,691	167,273,415	153,929,140	140,584,864	127,240,589	113,896,313	100,552,037

4.9: Results Analysis

The project had an NPV of Ksh.1,286,282 when analyzed using the NPV method and an IRR of 45% when analyzed using the IRR method. We can therefore conclusively consider the project feasible. In the sensitivity analysis, semolina price range was set to reflect highest and lowest 2017 semolina cost (Ksh.50/kg to Ksh.70/kg). Possible pasta prices range was set to reflect 2017/18 calculated minimum pasta prices with Ksh.5 increments up to Ksh.105 (Ksh.70/kg to Ksh.100/kg). From the sensitivity analysis, it was noted that the project remained feasible at all proposed pasta sales prices, as long as semolina cost did not exceed Ksh.56/Kilogram. For the project to be feasible at semolina costs above Ksh.56/Kilogram and up to Ksh.70/Kilogram, the sales price would then need to be increased from ksh.73.56/Kg. to at least Ksh.85/Kg. This price would still competitive when compared to imported pasta prices. Table 5.0 below shows the results from a pasta price survey in the retail market in Kenya. Assumed wholesale prices were calculated by deducting an assumed 30% markup on the retail prices.

Table 5.0: Pasta Retail Prices in Kenya (2018)

2018 Prices (Ksh.)	Retail Prices	Assumed Wholesale Price
Min Price/Kg.	112.50	78.75
Ave Price/Kg.	261.89	183.32

From the sensitivity results we see that the projects profitability is in a great extent cushioned against market price changes and to a lesser extent cushioned against semolina cost changes. This gives us flexibility that we might need in pasta pricing as we enter into the market for the first time.

CHAPTER V: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1: Summary and Conclusion

This research was intended to determine if it is economically feasible to produce and market pasta in Kenya. This was necessitated by the fact that Kenya's pasta demand had grown and was projected continue to growing. Currently the only way of meeting the increasing demand is by importing more pasta from the rest of the world. Data on Kenya's pasta imports sourced from KNBS was used to confirm this demand and also used to compute possible pasta prices. To make this study more practical, a simulated pasta production plant was set up in Nairobi in Kenya. The plant was financed through a Ksh.12 million loan to be repaid in 7years at 14% interest rate. Costs and revenues were projected for the 7year life of the project. The projects feasibility was then evaluated through analyzing the projected cash flows using NPV and IRR methods. Using the NPV method, the project had a positive NPV (Ksh.1,286,282), while using the IRR method it had an IRR of 45% which was above the cost of capital; it was therefore concluded that the project was feasible. It was also noted that both semolina cost (main pasta production raw), and pasta sales price were important feasibility drivers. NPV's sensitivity to both semolina cost and pasta sales price was then determined. From the sensitivity analysis, it was noted that the project remained feasible at all proposed pasta sales prices, as long as semolina cost did not exceed Ksh.56/Kilogram. For the project to be feasible at semolina costs above Ksh.56/Kilogram and up to Ksh.70/Kilogram, the sales price would then need to be increased from ksh.73.56/Kg. to at least Ksh.85/Kg.

It is therefore recommended that such import substitution project be initiated as they would improve the country's financial well-being, fuel industrialization, reduce unemployment, as well as reduce overreliance of imports in Kenya.

5.2: Recommendations

As shown in this study, there are feasible opportunities for investments in import substitution projects in Kenya. Investing in such projects would create wealth, reduce employment, and enrich the lives of Kenyans. The Kenyan government has a stake in this as it would help fulfill part of the government's vision 2030 plan. To support such investments, the government should change some its policies. It was however noted that when importing machinery and equipment in Kenya, one has to pay import taxes and duties of approximately 40%. Kenya does not manufacture its own machines and equipment, hence almost all machines, equipment, and spare parts have to be imported. This significantly increases plant startup, and other operational costs, and in turn discourages investors. I would therefore recommend that the government reduce or abolishes such tax on consumer goods processing equipment. I would also recommend that the government keep or raise taxes on imported processed consumer goods that can be manufactured in Kenya. Although this move might be seen as a retrogressive trade policy, it would nonetheless discourage importation of goods that we can manufacture and also encourage manufacturing of the same locally in Kenya.

5.3 Limitations of the Study

Although the project was found to be feasible, there are limitations that might affect its feasibility. Increased domestic production might drive pasta prices down, hence reducing profit margins. If this happens, then the project might not be feasible. Currently, Kenya's government has in place import taxes and tariffs that in-turn, keep imported pasta prices high. This is in favor of domestic production as domestic producers can set higher profit margins, and be more profitable. If the government lowered import taxes and tariffs, then imported pasta prices might be lowered. With lower pasta prices, domestic production

profitability will be lowered too. In such a scenario, then the project might not be feasible. It is assumed that there will be no quality differences between imported and locally produced pasta. If there arose quality issues with domestically produced pasta, then demand might be lowered. Lower demand might not be enough to support feasible domestic production.

5.4: Beyond Pasta

This research project was deemed feasible and profitable while it only took into account substituting approximately 3% of the total pasta imported in Kenya. This means that there are huge opportunities that are open and ready for exploration. There has been growth on consumer goods use in Kenya and other developing countries in Africa. This growth seem to be fueled by growing populations that keep demanding for more consumer goods. This growth coupled with lack of domestic processing brings with it many investment opportunities. As agribusiness investors we therefore need open our eyes, jump in, and seize the opportunities.

WORKS CITED

Bank, World. 2018. *World Bank in Kenya.* February. Accessed February 2018. http://www.worldbank.org/en/country/kenya/overview.

CIA. 2018. *The World Fact Book.* February. Accessed February 2018. https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html
.

Fengler, Wolfgang. 2010. "Demographic Transition and Growth in Kenya." *World Bank.* April. Accessed February 2018. http://www.worldbank.org/en/news/opinion/2010/04/28/demographic-transition-growth-kenya.

GOK. 2018. "Vision-2030-manufacturing-sector." *http://www.industrialization.go.ke.* March. Accessed March 2018. http://www.industrialization.go.ke/images/downloads/vision-2030-manufacturing-sector.pdf.

Hoseny, Carl. 1998. "Pasta and Noodles." In *Pinciples of Cereal Science and Technology*, by Carl Hoseney, 325-326. St. Paul: AACC.

Investopedia. 2018. *How does GDP affect the standard of living?* January. Accessed February 2018. https://www.investopedia.com/ask/answers/060115/how-does-gross-domestic-product-gdp-affect-standard-living.asp.

Investopedia, Online. 2018. *Walkthrough corporate-finance.* February. Accessed February 2018. https://www.investopedia.com/walkthrough/corporate-finance/4/npv-irr/introduction.aspx.

IPO. 2018. *The History of Pasta.* Accessed January 2018. http://www.internationalpasta.org/index.aspx?id=6.

Kill, Ron, and Turnbull, K. 2008. *Pasta and Semolina Technology.* ProQuest Ebook Central. Accessed October 30, 2017. http://onlinelibrary.wiley.com/book/10.1002/9780470999370;jsessionid=4C45C15A59B1E8AF3C594B46E1B879F6.f03t04.

KNBS. 2018. *Statistical Releases.* February 2. Accessed February 2, 2018. https://www.knbs.or.ke/data-releases/.

KRA. 2018. *Importation Duty.* March. Accessed March 2018. www.revenue.go.ke/customs/faqcustoms.html#Q6.

Mishra, R.C. 2005. *Modern Project Management.* Prod. ProQuest Ebook Central. New Age International Pvt. Ltd., Publishers. Accessed April 2018. https://ebookcentral-proquest-com.er.lib.k-state.edu/lib/ksu/detail.action?docID=410318.

NDWC. 2018. *Pasta Trivia.* March. Accessed March 2018. http://www.ndwheat.com/uploads/resources/731/pasta-trivia-website.pdf.

NWSC. 2018. *Water Tariffs.* March. Accessed March 2018. https://www.nairobiwater.co.ke/index.php/en/watertariffs.

Olam, Group. 2016. *Olamgroup.com.* January 11. Accessed January 2018. http://olamgroup.com/news/olam-acquire-wheat-milling-pasta-manufacturing-assets-bua-group-nigeria-us275m/#sthash.UJPuVien.oOq4veuw.dpbs.

Power, Kenya. 2018. *Electricity Cost in Kenya.* March. Accessed March 2018. https://stima.regulusweb.com/.

Raghu, Anuradha. 2016. "Olam bets on Africa reward as on-the-go food demand to climb." *www.mgafrica.com.* March 16. Accessed January 2018. http://mgafrica.com/article/2016-03-16-continents-increasing-appetite-for-food-products-attracts-one-of-worlds-largest-traders.

USDA. 2010. *State Facts.* Accessed April 10, 2011. http://www.ers.usda.gov/StateFacts/.

Wikipedia. 2018. *Olam International.* February. Accessed January 2018. https://en.wikipedia.org/wiki/Olam_International.

Worldbank. 2018. "GDP per capita." *https://data.worldbank.org/.* January. Accessed January 2018. https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2016&locations=KE&start=1960&view=chart.

Worldometers. 2018. *Kenya Population.* February. Accessed February 2018. http://www.worldometers.info/world-population/kenya-population/.