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Table of Contents

1. Summary

1.1 Introduction

This report summarises research into the marketing and regulatory Opportunities and including value chains of a group of four grain-based traditional African foods, Akpan, Gowé, Kenkey and Ksikh Sa'eedi. It constitutes one of four reports that review the market for these traditional foods using value chain analysis as part of the European Union funded project the African Food Tradition Revisited by Research (AFTER).

The four products considered here are:

- Akpan, a yoghurt-like preparation from the Republic of Benin made from fermented maize;
- Gowé, a sweet paste, also from the Republic of Benin, made of malted (or non-malted) sorghum or maize flour and consumed as a beverage;
- Kenkey, a stiff dough, from Ghana, made from fermented, de-hulled, maize meal and consumed as a stiff porridge or a beverage.
- Kiskh Sa'eedi, a fermented snack and beverage from Egypt made from milk and wheat and consumed as a snack or beverage.

The purpose of this report is to understand all aspects of the marketing and regulatory Opportunities and including value chains for these food products and to use this information formulate marketing plans with a view to guiding efforts to re-engineer African foods.

The method used to undertake this research was a mixture of literature review and key informant interviews. A list of interviewees is provided at Annex 2 and literature consulted can be found at the end of this report. The field research was conducted during the period October to December 2011. The key elements of the method and initial value chain maps, elements of the marketing mix and market GAP analysis were developed by the teams collectively at a value chain workshop held in Accra, Ghana from 3-5 October 2011.

Value chain analysis: considers the actors and governance of all elements of the product from primary production to consumption.

Marketing Mix: describes the key elements necessary to bring the product to the market including, how the product is defined, its price, how it should be promoted, the place that consumers would like to buy it and how the people who consumer the product are defined.

Gap Analysis: reviews the range of different products and markets available and assesses what might be needed to bridge the gap between where the current market for the product is and where it could be after re-engineering.

The scope of the analysis included all aspects from production to consumption.

Some challenges were encountered during the research. Lack of resources to undertake field-work limited the scope of some of the research.

The report consists of five sections covering the value chains for each of the four AFTER grain based products in detail and, in this first Chapter, summarizing the key findings for each product and this group of products as a whole. For each individual AFTER product in this group the product is described, a value chain map outlined, the marketing mix reviewed (product, price, place, promotion and people), Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis completed, and market gap analysis conducted. The findings are summarized here and some conclusions and recommendations drawn.

One aim of value chain analysis is to find **key success factors** that will drive the market development for AFTER products. These key success factors include identifying potential bottle-necks that might prevent a product from reaching a market or opportunities to upgrade a product (e.g. improve its quality, process it, package it, promote it to a new and more value market and/or reduce its unit cost of production for example).

Individual reports were created by teams in each country as follows: Akpan and Gowe - Victor Anihouvi, Laurent Adinsi, and Joseph Hounhouigan, Kenkey - Charlotte Oduro-Yeboah, Mary Obodai, Hayford Ofori, George Anyebuno, Theophilus Annan, Charles Tortoe, Margaret Owusu and Wisdom Amoa-Awua and Kiskh Sa'eedi - Habiba Hassan-Wassef. This summary was compiled by Ben Bennett.

1.2 Product descriptions

In order to establish which market norms apply to a product it is necessary to know what forms that product takes in the market. Different types of product enter different market chains. Different end products compete in different market segments. For these pre and post engineered African food products the first step is to clearly define what the products are and which market segments they currently occupy.

Akpan is made from two intermediate products, Ogi or Mawè. Both of these products are semi-fermented maize that are then combined in both cooked and un-cooked form to make Akpan. Akpan is sold as a street food ready-to-drink beverage with milk, sugar and ice added. It is also sold as a ready-to-use paste for home production of a reconstituted beverage.

Gowé is a paste of fermented malted and non-malted sorghum or maize flour. It is sold as a ready-to-use paste for home reconstitution as a beverage with sugar, milk and ice added. It is also, like Akpan, a commonly sold street-food as a beverage.

Kenkey is made from fermented maize flour (or dough) that is then boiled and presented in a ready-to-eat form. Several different forms of Kenkey exist ('Fanti', 'Ga' and 'White) depending on the degree of fermentation and hulling of raw material. Kenkey is a ready-to-eat convenience food commonly consumed throughout Ghana, but more common in the coastal regions.

Kiskh Sa'eedi is a homemade fermented food made using buttermilk and parboiled wheat of local breeds. Dried balls of Kiskh are used as a snack food, reconstituted in water as a beverage or added to recipes as a flavour enhancer or thickening agent. Kiskh Sa'eedi is largely untraded in its current form.

The four grain based products considered here are, in various forms, homemade foods which are ready-to-eat or form the basis for traditional dishes. None of these products enters formal trade or has recognition as a formal food with a recorded standard format.

1.3 Value chain descriptions

Actors and processes were described for all the products and typologies developed. Using these definitions, value chain maps were created to show the relationships between actors and processes. On these maps additional information was overlaid including: the gender differentiation of each value chain, the prices of products at each stage in the chain and the relative share of each actor in the final on-shelf product price.

Key findings from the development of value chain maps are:

Akpan and Gowé

The amount paid to farmers for the raw material of Akpan and Gowé are a relatively substantial amount of the final product price paid by consumers. This lack of in-chain value addition represents a substantial upgrading opportunity.

Lack of a standard product means that the final consumer product varies in taste making purchase decisions uncertain.

Shelf life is short meaning that consumers usually have to eat on the day of purchase. This greatly limits the potential of the product for a mass market through retail outlets

Demand is not specific to any particular consumer segment (e.g. income bracket) suggesting that differentiation for higher value markets is possible.

Kenkey

Final consumer product value for Kenkey is fairly evenly spread among the actors in the value chain. Farmers receive about 11% of the final value which would seem acceptable.

Kenkey processors experience highly variable raw material costs but are largely unable to pass these variations on to consumers.

Like Akpan and Gowé, Kenkey has a limited shelf-life. Significant market gains could be achieved by extending shelf-life combined with better product presentation and safety.

It was found that value chains for Akpan, Gowé and Kenkey are highly gendered. Whilst production and marketing of the key ingredients are mainly a male preserve, processing, enterprise ownership and informal retailing of these products is commonly done by women. This means that upgrading has the potential to directly benefit women.

Kiskh Sa'eedi (KS)

KS is traded in small quantities almost exclusively on the informal market.

Value chain mapping revealed a number of important service providers in KS that had not hitherto been considered. These include specialist raw material providers (specific local wheat strains are needed for example) and equipment producers (e.g. pots).

Quality and safety of ingredients (milk, wheat, water) present challenges to commercialization of the product.

Costs of production are largely unknown because many cost factors are not charged or are shared among families and neighbours.

Continuity of market supply of KS from a home-based industry to a mass market presents a major challenge to product development. A key success factor will involve managing the move to scale.

1.4 Marketing mix

Review of the key elements that make up the marketing mix (e.g. 'product', 'price', 'place' of sale, 'promotion of the product and the 'people' involved) revealed the following as indicated in table 1.

Table 1: The marketing mix for reengineered AFTER products – key findings
Nb: no marketing mix was received for Kiskh Sa'eedi

	Product	Price	Place	Promotion	People
Akpan	• Ready to drink • Dried • Improved 'safe' traditional	Would have to compete with yoghurt products	In pre-packed form in supermarkets	Various mass media	All income groups
Gowe	Dried Yoghurt-like Improved traditional	Driven by sorghum availability Competes with Akpan	In pre-packed form in supermarkets	Various mass media	
Kenkey	White Kenkey		In more formal markets like supermarkets	Various mass media	All income groups

1.5 SWOT Analysis

For each existing and re-engineered product a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis was conducted. This highlighted the range of internal values and external issues that need to be addressed during re-engineering. Highlights are shown in table 2.

Table 2: SWOT Analysis highlights

	Strengths	Weaknesses	Opportunities	Threats
Akpan	Nutritious and cheaper than commercial yoghurts	Short shelf life and no standard production method	Improved presentation	Many other products in the same yoghurt market
Gowe	Nutritious and popular	Short shelf life and food safety issues	Improved presentation	Competition from other grain products and shortage of sorghum
Kenkey **- Ga and Fanti**	Cheap, convenient and popular	Short shelf-life No particular advantage over similar grain products	If re-engineered could be introduced to new consumers	Food safety
Kenkey **- White**	Milder than other grain products	Not as well-known as other Kenkeys	Would be novel to many consumers	Food safety
Kiskh Sa'eedi	Strong product identity with	No standard product.	Domestic tourism and	Food safety. Intellectual

	important Egyptian values (history, culture etc.)	No organized supply chain	urban markets	property protection not assured.

1.6 Market GAP analysis

GAP analysis considered the potential market space that the re-engineered AFTER product might occupy.

- For Akpan and Gowe, the finding was that the market space is for products in the formal market place.

- GAP analysis for Kenkey showed that there are in fact a huge range of potential products and markets that could be exploited. The general consensus was that Ghana's fast growing supermarket sector had the greatest potential for a re-engineered product and that the products should be white Kenkey as a stiff dough and bottled mash of white Kenkey.

- For Kiskh Sa'eedi the tourist industry and local supermarkets seem to hold the most potential for an improved traditional product. Other markets identified but not yet tested include for an energy bar, a snack food and a breakfast cereal.

1.7 Recommendations

Akpan and Gowe
Standardization and quality management allied to a better on-shelf offer could, it is believed, result in a significant increase in demand. It is recommended that is the reengineered products are standardised with improved quality and these products should be targeted at the formal market sector.

Kenkey
Concentration of effort on white Kenkey as a 'new' product for the fast growing Ghanaian domestic consumer product market shows great promise. It is recommended that the reengineering focus on improving the presentation, quality and food safety. The high potential for reengineered Kenkey in Ghana's supermarkets was emphasized by the research.

Kiskh Sa'eedi
Kiskh Sa'eedi currently falls completely beneath the radar of the formal market in Egypt. Value chain analysis has revealed a number of new and important issues in the development of this product. For example, the supply of specialized raw materials (wheat and milk) and product specific pots for fermentation was, hitherto, an unrealized key element in the total package of processes that is

traditional Kiskh Sa'eedi. It is recommended that a nuanced or gradual market development strategy for Kiskh Sa'eedi be considered. This should have several strands including working with the domestic tourism sector, local chefs and specialist local food manufacturers to develop a new range of traditional Egyptian food offers.

2. Akpan

2.1 Introduction

This section shows the value chain for Akpan, a yogurt-like product made in Benin. It was completed by Dr Victor Anihouvi, Mr Laurent Adinsi and Prof. Joseph Hounhouigan between November and December 2011.

The purpose of this report is to scope out and reveal the value chain for Akpan. This value chain analysis includes the key actors and processes involved in production and consumption of Akpan. In addition, the analysis uses the value chain information to build Strengths, Weaknesses, Opportunities and Threat (SWOT) and GAP analyses for existing and re-engineered AFTER products. The work builds upon the AFTER survey (D1.1.2.1, WP1) and the literature search. It should also be read in conjunction with the regulatory and market access report (D5.1.2.1, WP5).

The approach taken to undertake the research was developed at a value chain workshop in Accra, Ghana from 3-5 October 2011 and involved interviews with key value chain actors such as cereal producers, cereal vendors, Akpan processors, the consumers and different support services. The reports scope included all aspects of the value chain as far as was possible from the perspective of in-country research. Problems encountered included difficulties collecting information (e.g., it was a time consuming activity).

The reports is laid out as follows: after an introduction, aspects such as product description, chain actors and their functions, the main processes in the chain, the services and support necessary to the functioning of the chain, the opportunities, bottle-necks, problems and key success factors from value chain analysis were discussed. This is followed by the marketing mix and the market Gap analysis. Summary and conclusions can be found in the final section along with some recommendations relevant to AFTER project implementation.

2.2 Akpan product description

Akpan is a yogurt-like product traditionally prepared from “Ogi” or “Mawè”, two fermented cereal mash products, but Akpan from Ogi is the most common. Akpan is produced at home, without any manufacturing but by cottage plants. Ogi used to produce Akpan is obtained from white maize as raw material. It is precooked and later mixed with additives such as milk, sugar and ice or the sour Ogi “supernatant” (e.g. the liquid left after fermentation) before consuming.

Akpan is mainly sold as street food but it could be sold sometimes in the open market. For the commercialization of Akpan, the whole product is packaged in a plastic bucket supplied with cover and served as ready-to-drink beverage in a cup containing about 140 to 275 ml of Akpan in which additives such as concentrated milk, sugar and ice can be added in variable proportions. Akpan is also packed in leaves and sold as a paste for the preparation of “ready-to-use” beverage (Figure 1). It is consumed at home after reconstitution.

Figure 1: Akpan in various forms

		
Akpan packed in leafy packaging		Ready to use Akpan diluted in water with ice

Akpan is a yogurt-like product traditionally prepared in Benin from "Ogi" or "Mawè", two fermented cereal mash products. These intermediate products are precooked and later mixed extemporally with additives such as milk, sugar and ice or the sour Ogi "supernatant" before consuming. Akpan is usually sold by street vendors for direct consumption mainly in urban areas. The shelf life of Akpan however, limited to 2-3 days at ambient temperature and one week in refrigerator (4°C), restricts market access. A similar product called "Mahewu" is produced in Southern Africa and is available on the supermarket shelves, but not consumed with condensed milk (see Figure 2).

Figure 2: Examples of Mahewu powder from South Africa and Corn Ogi from Ghana

	
Source:	
http://www.satooz.com/product_images/h/163/Mahewuovernight_70191_zoom.JPG	http://www.odeigahouse.com

The two traditional intermediate products (Ogi and Mawè) used for Akpan production should be prepared from sorted and cleaned maize which should be free from foreign matter. Ogi is a gruel obtained by fermentation of a suspension of wet-milled maize and wet sieved maize flour in water, while mawè is fermented maize dough. Mawè is generally rolled up into a ball and sold at local market; on the contrary Ogi is not marketed in this state in Benin.

2.3 Value Chain Map

2.3.1 Actors

The Akpan chain is mainly constituted of actors such as the **farmers**, the **cereal vendors**, the **millers**, the **akpan processors/sellers** and the **consumers**. The typology of actors is summarized in table 3.

The **farmers** produce the maize or sorghum and sell to **cereal vendors.** The cereal vendors purchase cereal from farmers and sell it to processors. The **millers** are exclusively males; their activity consists of grinding the raw materials (maize or sorghum) for processors before processing. The **processors** produce Akpan and sell to consumers. Generally, Akpan is sold mixed with ingredients (e.g. ice, milk and sugar – see figure 3). These ingredients are sold to Akpan processors by the **ice vendors** and **milk and sugar vendors**. Other inputs suppliers include the **leaf sellers,** the **container sellers** (plastic bucket to package Akpan for transportation) and cup to serve Akpan to consumers, and **firewood sellers**. Contrary to millers, the production and the commercialization of Akpan are only done by women.

Figure 3: Akpan ready for consumption

Source: http://www.after-fp7.eu/en/products/cereal_based_products

The **consumers** are the last actors in the chain. Both high and low income consumers buy Akpan and consume it at the selling place or take it at home to consume. At home, they may store Akpan for a while before consumption. Consumers expect good quality Akpan and this is defined as: white colour, sour taste and pronounced aroma of Ogi. The services and support necessary to the functioning of the value chain are discussed in section 2.3.3.

A summary description of the various actors in the Akpan value chain is given in the Table 3 below.

Table 3: Typology of actors

Actors (gender)	Role, Responsibility, Right	Discussion, Important point ; Aide memoire
Farmers (males)	Produce, harvest and store maize or sorghum and sell to cereal vendors and sometimes to processors	Maize is cultivated in all the agro ecological zones of Benin while sorghum is grown in the North of the country. These raw materials are used in single or in combination for the production of Akpan
Cereal vendors (both sexes)	Purchase maize or sorghum from farmers and sell to processors	
Millers (Males)	Mill steeped grains for processors	They mill different types of raw materials (maize, sorghum, piece of dried yam etc.) with the same machine; so there is a potential of cross contamination
Processors (Females)		
- Large scale processors	Process large quantities of grains into Akpan and sell	Process between 60-120 kg /month; they represent 4.1 % of processors interviewed
- Medium scale processors	Process medium quantity of grains into Akpan and sell	Process between 20-60 kg /month; they represent 37.6% of processors interviewed
- Small scale processors	Process small quantities of grains into Akpan and sell	Process less than 20 kg / month; they represent 58.2% of processors interviewed
Vendors (Females)	Sell at fixed location or as hawker vendors	There are more fixed location vendors; They also the process
Other Inputs Suppliers (gender unknown) • Sugar sellers • Ice sellers • Milk sellers • Firewood sellers	They provide Akpan processors/vendors with ingredients such as sugar, ice, milk and firewood	They usually sell many types of goods Firewood is expensive during the rainy season
Consumers (both sexes)	Buy from producers/sellers and consume	They expect good quality Akpan

Source: AFTER research

2.3.2 Processing

The traditional processing of Akpan can be devised into two main steps: the preparation of intermediate products (Ogi or Mawè) and the processing of Ogi or

Mawè into Akpan. The general procedure of processing of Ogi includes steeping of grain, wet-milling, wet-sieving, decanting and fermentation during 1-3 days at ambient temperature; the pH of Ogi is around 4 (Nago, 1997)**.** For Mawè, the processing method include washing, grinding, dry sieving**,** dampening, a second step of grinding after mixing the **g**rits and the wet flour, followed by kneading and fermentation at ambient temperature during 1 -3 days; the pH values of Mawè ranged between 3.5 and 4 (Hounhouigan et *al.,* 1993).

For akpan processing with Ogi which remains the common technology, the Ogi mash obtained is made into slurry and only mid-cooked (precooked) or Ogi can be divided into two parts. One part is made into slurry and cooked, then mixed with uncooked part (raw Ogi). In both cases, a moderately free flowing gruel is the final product (akpan) which can be sweetened to taste before consumption by addition of sugar, milk and ice. In addition to this traditional processing method, Mestres et al., (2001) have developed an improved procedure of production of Akpan from Ogi. In this procedure, Ogi is just fermented during 24 h; Akpan is then prepared by mixing a portion of cooked (ratio of 2/5) and non-cooked Ogi slurry (ratio of 3/5). The resulting Akpan is mixed with additives before consuming. The typology of processes is summarized in table 4.

Table 4: Typology of processes

Process	Description	Discussion
Raw materials	White maize and sorghum	The grains must be free of stones and weevil. White maize and red sorghum are preferred for Akpan production
Cleaning	Removal of dust, sand, stones and damaged grains,	Tedious unit operation
Pre-cooking	The grains are soaked in boiled-water for10-40min	If the precooking duration is not optimal (e.g. maximum water absorption), the resulted starchy sediment will have coarse particles after milling The usual practice is to check the optimum water absorption by breaking the grains with the teeth to measure the tenderness
Steeping	Grains are steeped during 24-72 h at local ambient temperature (28-30°C)	Spoilage of grains may produce foul smell
Milling	The grains are milled (once) using a plate disc mill	The plate disc mill may be contaminated by other matter because the mill is used to grind other type of product such as leguminous, piece of dried yam etc.
Wet sieving	The ground grains are wet-sieved through white clothes of muslin using tap water. Fine particles are forced to pass through the clothes of muslin	Has an effect on the texture of final product

Process	Description	Discussion
	by hand. Finally the slurry/bran composed of residual particles is taken out	
Fermentation / decanting	The suspension is put in the bowl and goes for clarification and fermentation for 24-72 h to obtain Ogi sediment. The supernatant is removed and the fermented starch sediment is collected for Akpan preparation	The supernatant must be changed every day to maintain the quality of Ogi sediment (white colour, pleasant odour, optimal acidity)
Cooking	A part of Ogi is added to the hot water for cooking (10-25min).	It is important to master this step
Mixture of cooked portion of Ogi and non-cooked Ogi	The cooked product obtained is mixed with the rest of fermented starch sediment outside of fire to obtain the final product Akpan	The degree of cooking of Ogi mash into Akpan can impact the quality of the end product
Packaging of Akpan in a container e.g. plastic bucket	Akpan is then packaged in a container (e.g. plastic bucket) for transportation to the selling place	The nature of the container (e.g. the cleanliness) can be a source of contamination of the product
Transportation to the selling points.	At the selling point, Akpan is served as ready to drink beverage in a cup containing about 140 to 275 ml of Akpan in which additives such as concentrated milk, sugar and ice can be added in variable proportions. Akpan is also packed in leaves and sold as a paste for the preparation of "ready-to-use" beverage. At home it is consumed after reconstitution (addition of milk, sugar and ice).	The nature of the container (e.g. cup) in which Akpan is served can be a source of contamination of the product In the same way the nature of additives (concentrated milk, powder of sugar) and the spoon used to consume Akpan can also be a source of contamination of the product

Source: AFTER Research

2.3.3 Services

The services and support necessary to make the chain work included: transportation of raw materials (maize or sorghum) from the buying places to the processing site. Most of the time the transportation of maize or sorghum is done by **taxi motor-bike driver** when the quantity of raw materials bought is large.

Another important support service to the functioning of the value chain is the container (plastic bucket to package Akpan for transportation) and cup (both metal and plastic to serve Akpan to consumers), and firewood vendors. Other service suppliers are the millers. Nowadays, none of processors grind the maize at home by using millstone because this labour is hard and time consuming. The

jute sack vendors are also important for the packaging of maize and sorghum from farm to the market and other selling places. The **intercity car drivers** are also necessary for transportation of maize and sorghum to market and other selling places.

As Akpan is processed by the traditional and informal food sector, the rules related to formal food processing sector are not applied. The reason is that there are no specific rules about the traditional food products. However, the rules concerning the hygiene of processing site and selling places are mostly controlled by the food inspectors from "la Direction de l'Hygiène et de l'Assainissement de Base (DHAB)" of the Ministry of Public Health and "la Direction de l'Alimentation et de la Nutrition Appliquées (DANA)" of the Ministry of Agriculture, livestock and fishery in charge of this type of control. Other supports for official export are the official laboratories in charge of quality control. In the "Union Economique et Monétaire Ouest Africaine" (UEMOA) zone there is free trade of goods; this means that an Akpan processor don't need any permit before exporting, but they have to prove that their product is safe through the report of analysis done on the product by an official laboratory (DANA laboratory) followed by the safety certificate given by DANA which is the only official control service in charge of such activity.

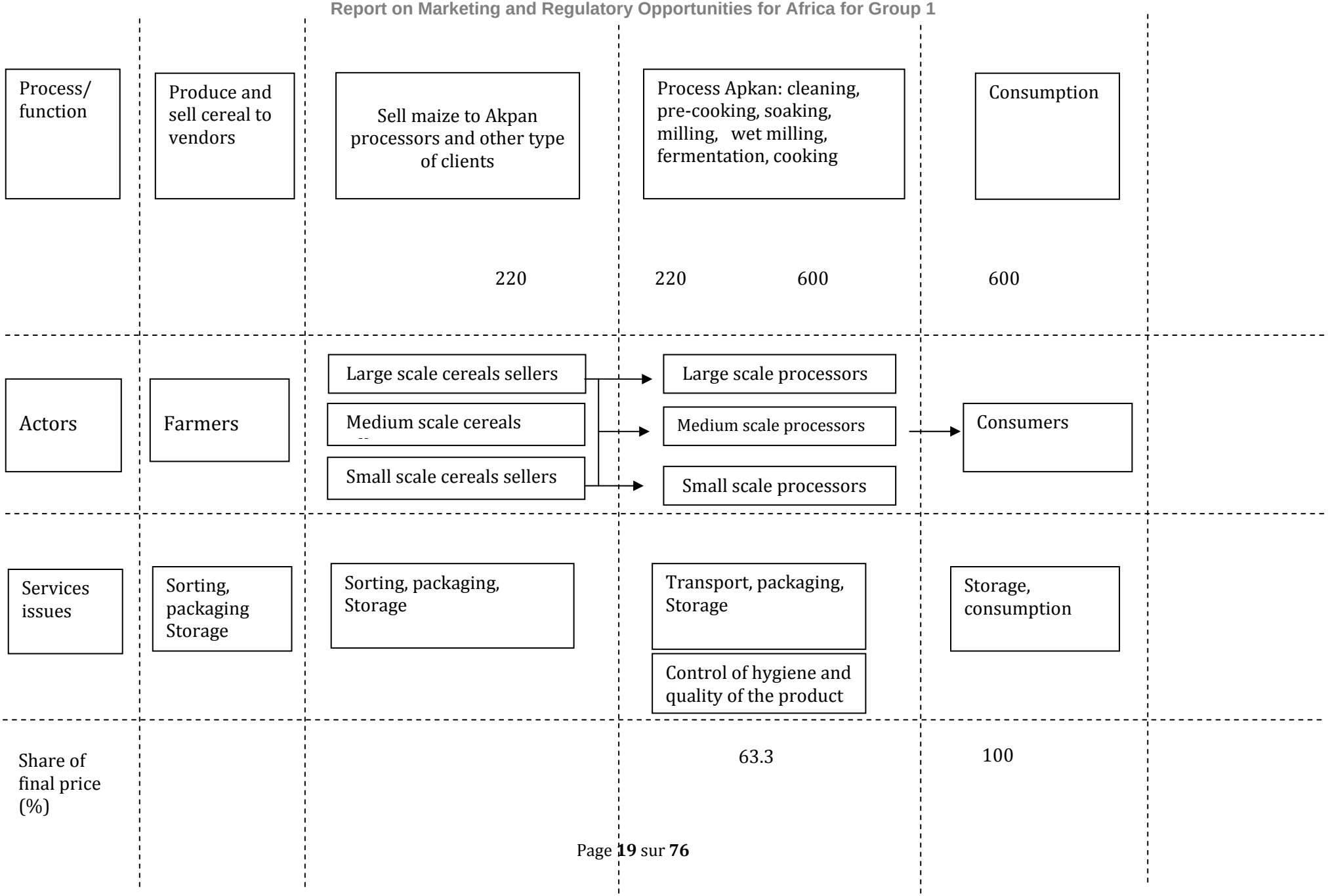
2.3.4 Summary of opportunities, bottle-necks, problems and key success factors from value chain analysis

The most important problem related to Akpan processing is the lack of standardization of all the unit operations, especially of the fermentation and cooking operations. For example when the precooking duration of the grains during the production of Akpan is not mastered in terms of water absorption of grains, the resulted starchy sediment will have coarse particles size after milling. Other constraint is that the intermediate products (Ogi or Mawè) and the Akpan itself become sour during storage/marketing. Indeed, the shelf life of Akpan is too short (2-3 days at ambient temperature and 8 days at 4°C in a refrigerator). Concerning the storage of Ogi, the processors often change the steeping water every day to maintain its quality characteristics (e.g. white colour, pleasant odour, optimal acidity). In this respect, the stabilization of intermediate products Ogi or Mawè as powder/flour can be beneficial to the processors. Another constraint is that, the processing method of Akpan from cereal grain to end product is time-consuming. In this respect, the improved method developed by Mestres et al. (2001) could be an alternative to reduce the duration of production of Akpan. However, the main alternative that will give satisfactory results in terms of improvement of processing and quality of the product is the reengineering of processing method through a number of actions such as the standardization of pre-cooking duration of grains in order to get an optimal water absorption, the number of milling to get fine particle size product and the cooking duration of Ogi to obtain Akpan. In addition, there is a need to control the fermentation step and look for a new type of packaging of Akpan which allow a long term conservation of the product. It is expected that all these upgrading

actions will lead to the production of new type and safety Akpan with a new presentation to extend Akpan market at national level and for export.

The target customers are: at national level, both high and low income groups, traditional caterers, street food vendors, restaurants and boarding schools, and other African countries, and Africans in the diaspora (United Kingdom, France and United States of America) and Europeans (United Kingdom and France) for external customers. The value chain map for Akpan is represented by the figure 4.

Figure 4: Value Chain Map for Akpan



Source: AFTER research

Socio economic data collected along the chain during the survey revealed that the maize vendors buy maize from farmers for 180 F/kg and sell it to processors for 220 F CFA/kg; the processors produce 3 litres of Akpan from 1 kg of maize and sell to consumers for 600 F CFA and this according to the period of sale; the rough averages share of the final price along the chain are 6.7 and 63.3 % for maize vendors and Akpan processors respectively (Fig. 1). This means that the farmers and other actors of the chain share about 30 % of the final price of Akpan. Currently Akpan is not exported.

2.4 The Marketing Mix

2.4.1 Product

Three types of Akpan made from Ogi are expected to put up for sale after the reengineering: ready to drink Akpan mixed with milk and sugar and packaged like yoghurt, dried Akpan that will be reconstituted before consumption and improved traditional Akpan.

2.4.2 Price

The price of raw materials (maize or sorghum) is the first determining factor in the market mix of Akpan. The price of ingredients (ice, sugar, milk) is also a determining factor. Generally cost of labour is not calculated in spite of this labour is intensive. According to Akpan processors, sorghum is expensive from April to December and maize from January to June. The selling price of Akpan follows the same variation during the year. Currently, a cup (60 g) of Akpan cost 100 F CFA; this means that 100g cost approximately 165 F CFA. Such level of price could probably explain the very high level of consumption of this beverage.

For the three new types of Akpan, in addition to factors evoked above, the price of competitive product such as the conventional yoghurt (approximately 200 F CFA/100g) should be taking into account to fix their selling price, since Akpan is mostly defined as vegetable yoghurt and favourably compared to the conventional yoghurt.

2.4.3 Place

Currently Akpan is mainly sold as street food; however, a number of initiatives are noted from some processors who try to package their product by using the conventional containers e.g. yoghurt - like container. In addition, the results of the survey showed that some of consumers would prefer to buy Akpan in a well-packaged form in a supermarket**.** There is also a potential for Akpan being sold in other African countries and in some European countries after reengineering, and this is mainly because of its similarity with yoghurt. The main selling places are the supermarkets, restaurants and the target customers are both high and low income groups at national and international levels.

2.4.4 Promotion

As indicated above in section 2.4.1, three new types of Akpan (improved traditional Akpan, ready-to-drink Akpan mixed with milk and sugar and packaged like yoghurt and dried Akpan that will be reconstituted before consumption) are expected to be promoted after reengineering. These products will be promoted through a number of actions such as Nutritional information on the packages, radio advertisements, catchy TV advertisements, TV documentary, sponsoring of educational programs to attract the youth (T-shirts advertising Akpan), attractive phrases and participation to international food fairs.

2.5. Regulatory framework

As Akpan is processed by the traditional and informal food sector, the rules related to formal food processing sector are not applied. The reason is that there are no specific rules about the traditional food products. However, the rules concerning the hygiene of processing site and selling places are mostly controlled by the food inspectors from "la Direction de l'Hygiène et de l'Assainissement de Base (DHAB)" of the Ministry of Public Health and "la Direction de l'Alimentation et de la Nutrition Appliquées (DANA)" of the Ministry of Agriculture, livestock and fishery in charge of this type of control. Other supports for official export are the official laboratories in charge of quality control. In the "Union Economique et Monétaire Ouest Africaine" (UEMOA) zone there is free trade of goods; this means that an Akpan processor don't need any permit before exporting, but they have to prove that their product is safe through the report of analysis done on the product by an official laboratory (DANA laboratory) followed by the safety certificate given by DANA which is the only official control service in charge of such activity.

2.5 SWOT Analysis

The strengths, weaknesses, opportunities and threats (SWOT) for improved traditional Akpan and the two new versions of Akpan are summarized in tables 5. Through the SWOT analysis it appeared that there is a potential to promote Akpan with the reengineering perspectives and this is because Akpan production is a long tradition in Benin and Akpan is consumed by all classes of people, and is comparable with commercially available yoghurt. In this regard, Akpan has the advantage of a unique flavour of a fermented product which compares favourably to other fermented beverages in Benin.

The reengineering perspectives will contribute to improve both the new versions of Akpan and the traditional one, since a part of the reengineering results will be applied to the traditional sector. The production of good quality Akpan will offer opportunities to attend new markets in Africa, EU and US as well, as Akpan is a yoghurt–like product.

Two assumptions are formulated to support this SWOT analysis: a) Types of maize and sorghum used to produce Akpan will always be available; and, b) after re-engineering Akpan can be produced on an industrial scale

Table 5: SWOT analysis for Akpan production

STRENGTHS	WEAKNESSES
• Long tradition of production of Akpan in Benin • Availability of raw materials (maize and sorghum) • Akpan is consumed by all classes of people • Compared favourably to the vegetal yogurt • Cheap source of micronutrients	• Food safety issues associated with Akpan e.g. moulds • Short shelf life • Inappropriate processing technology (e.g. spontaneous fermentation, lack of standardization of cooking steps)
OPPORTUNITIES	THREATS
• Use of starters cultures to control the fermentation • Standardize the cooking by modelling the process • Improve presentation (packaging) • Look for new market for the re-engineered Akpan in Europe among Africans in the diaspora and among the elite population	• Competition from other national products such as yoghurt and yoghurt- like products • Behavioural changes in elite/youthful consumers • Types of maize and sorghum used for Akpan going into extinction

Source: AFTER Research

2.6 GAP Analysis

Currently Akpan is mainly sold as street food but it could be sold sometimes in the open markets which are both an informal market. After reengineering the new products are expected to attend the formal trade market. For this we have to improve the processing method and the safety of the new products as well. The traditional Akpan is known as good microbial quality product since the microorganisms which involve in fermentation of the intermediate products (Ogi and Mawè) are lactic acid bacteria. However the eventual presence of mycotoxins in Akpan could impact the safety of the product. In this respect, the reengineering will be done with the objective to overcome the Gap mainly in terms of safety.

2.7 Summary, conclusions and recommendations

Summary

This report summaries the value chain for Akpan in Benin. Different actors are associated to Akpan production e.g. the farmer, cereal vendors, the millers, the Akpan producers/sellers, the ingredients (milk, sugar, ice) sellers, firewood sellers, jute sack vendors and containers vendors. Services from the intercity car drivers and regulation structures are also needed to make the chain work. The main unit operations for Akpan production include the steeping of grains, the wet sieving, the fermentation and cooking. The price of final product depend on

the price of raw materials (maize or sorghum) and the ingredients (sugar, milk and sugar) used. Akpan is currently sold as street food and in the market

Conclusions

There is potential for improving Akpan to improve access to existing and new markets. It is expected that after reengineering, Akpan will be sold in different places such as supermarkets, restaurants and hotels, as well in Benin and outside of Benin. The major problems associated with Akpan production are related to the fermentation and cooking steps; another constraint is the short self-life of intermediate raw materials (Ogi and Mawè) and Akpan itself.

Recommendations

1. A preliminary re-engineering action on the process was already started but needs to be deeply investigated and tested through AFTER project, with the objective to upgrade the processing method, improve the sanitary quality and stabilize the product for long term conservation.
2. There is also a need to provide appropriate information and training to the farmers and cereal vendors for a better storage of grains after harvest and the processors in terms of hygiene for example.
3. The marketing and regulatory framework may need to be improved as the produce moves from the informal to the formal food sector

3. Gowé

3.1 Introduction

This section shows value chain for Gowé, a traditional fermented Beninese beverage made from malted and non-malted sorghum or maize flour. It was completed by Dr Victor Anihouvi, Mr Laurent Adinsi and Prof. Joseph Hounhouigan between November and December 2011.

The purpose of this section is to scope out and reveal the value chain for Gowé. This value chain included key actors and processes. In addition, the analysis uses the value chain information to build Strengths, Weaknesses, Opportunities and Threat (SWOT) and GAP analyses for existing and re-engineered AFTER products. The work builds upon the AFTER survey (D1.1.2.1, WP1) and the literature search. It should also be read in conjunction with the regulatory and market access report (D5.1.2.1, WP5).

The approach taken was developed at a value chain workshop in Accra, Ghana from 3-5 October 2011 and involved interviews with key value chain actors such as cereal producers, cereal vendors, Gowé processors, the consumers and different support services. The sections scope included all aspects of the value chain as far as was possible from the perspective of in-country research. Problems encountered included difficulties collecting information.

The section is laid out as follows: after an introduction, aspects such as product description, chain actors and their functions, the main processes in the chain, the services and support necessary to the functioning of the chain, the opportunities, bottle-necks, problems and key success factors from value chain analysis were discussed. This was followed by the marketing mix and the market Gap analysis. A summary and conclusions can be found in the final section along with some recommendations relevant to AFTER project implementation.

3.2 Product description

Gowé is a traditional Beninese beverage made by spontaneous fermentation of a blend of malted and non-malted sorghum or maize flour. However, Gowé made from sorghum (*Sorghum bicolor (L). Moench*) is the most commonly sold/consumed type of Gowé in Benin, and the red variety of sorghum is the most preferred by the consumers (Michodjehoun-Mestres et al., 2005). Gowé is mainly sold as street food. For commercialization, Gowé is presented as a cooked paste wrapped in leaves (*Thalia welwichii* or *tecktona grandis*) or plastic material in the form of a ball of 75 or 175 g, and sold as ready-to-serve Gowé (Figure 5). For consumption at home, it is diluted in water and ingredients (milk and sugar) are added if wanted to obtain the final beverage. Optionally Gowé can also be sold as ready-to-drink beverages after dilution in water with added sugar, milk and ice in bottles.

Figure 5: Different forms of Gowé


Gowé packaged in Thalia Welwichi



Ready to drink Gowé

Source: AFTER project photographs

3.3 Value Chain Map

3.3.1 Actors

The Gowé value chain is mainly constituted of various actors such as the **farmers**, the **cereal vendors**, the **millers**, the **Gowé processors/sellers** and the **consumers**. Other actors included the **leaf sellers,** the **container sellers** and the **firewood sellers**. The typology of actors is summarized in table 6.

The **farmers** produce the sorghum or maize and sell to **cereal vendors.** The cereal vendors purchase cereal from farmers and sell it to processors. The **millers** are exclusively males; their activity consists of grinding the raw materials (maize or sorghum) for processors before processing. The **processors** produce Gowé and sell to **consumers**. Gowé is also sold mixed with ingredients (e.g. ice, milk and sugar). These ingredients are sold to **Gowé processors** by the **ice vendors** and **milk and sugar vendors.** Other inputs suppliers include the **leaf sellers,** the **container sellers** (plastic or metal tray to package Gowé for transportation) and cup to serve Gowé to consumers, and **firewood sellers**. Unlike the millers, the production and the commercialization of Gowé are only done by women.

The **consumers** are the last actors in the chain. Both high and low income consumers buy Gowé and consume it at the selling place or take it at home to consume. At home, they may store the product for a while before consumption. They expect good quality (natural sweet taste and soft texture) Gowé. The services and support necessary to the functioning of the value chain are discussed in more detail below.

Table 6: Gowé typology of actors

Actors	Role, Responsibility, Right	Discussion, Important point ; Aide memoire
Farmers (males)	Produce, harvest and store maize or sorghum and sell to cereal vendors and	Maize is cultivated in all the agro ecological zones of Benin while sorghum is grown in

Actors	Role, Responsibility, Right	Discussion, Important point ; Aide memoire
	sometimes to processors	the North of the country.
Cereals sellers (**both sexes**)	Purchase maize or sorghum from farmers and sell to processors	
Millers (Males)	Mill cereal for processors	They mill different types of raw materials (maize, sorghum, piece of dried yam etc.) with the same machine; so there is a potential of cross contamination
Processors/vendors (Females) - Small scale processors	They all process small quantities of grains into Gowé and sell at fixed location or as hawker vendors	Process less than 35 kg of raw material / month They sell Gowé more as hawker vendors
Other Inputs Suppliers • Leaves (*Thalia welwichii* or *tecktona grandis*) sellers • Firewood sellers • Sugar sellers • Ice sellers • Milk sellers	They provide Gowé processors/vendors with materials (leaves, containers and firewood) and ingredients such as sugar, ice, milk	*Thalia welwichii* is not always available and may going into extinction Firewood is expensive during the rainy season
Consumers (both sexes)	Buy Gowé from producers/sellers and consume	They expect good quality Gowé

Source: AFTER research

3.3.2 Processes

Two types of raw material can be used to produce Gowé: sorghum or maize. However, Gowé made from sorghum (*Sorghum bicolor (L). Moench*) is the most common in several cities of Benin. Previous works on Gowé have led to the identification of three types of traditional processes and one modified technology, but the method with malting step is the most common. For the traditional methods, the main unit operations include: malting, fermentation and cooking, but in the case of the modified technology, the Gowé is produced without the malting step (Michodjehoun-Mestres et al.., 2005; Glidja et al.., 2006, Vieira-Dalodé et al.., 2007)

In the first traditional procedure, the sorghum grains are cleaned and soaked overnight (about 16 hours) at room temperature (28-30°C). The soaked grains are drained and left for germination at room temperature (28-30°C) for 2 days after which, the germinated grains are sun-dried for 4 days and then milled to obtain the malted sorghum flour. This flour is mixed with a part of a non-malted sorghum flour and water. The mixture is left for a first fermentation (e.g. saccharification) of 12h at room temperature (28-30°C). The fermented paste is then mixed with a porridge made with the rest of the non-malted sorghum flour and allowed to ferment a second time for 24 to 48h after which, the fermented mixture is cooked at 100°C for 30 min to obtain Gowé.

For second processing technique, the grains are cleaned and divided into two parts. One part (25%) is soaked, germinated, sun dried and milled. The malted grains flour obtained is kneaded with water and left to undergo a first fermentation of 12h. The rest of the grain (75%) is milled. A part of the flour is used to make hot slurry which is then mixed with the fermented product with the rest of the non-malted flour with water and left for a second fermentation of 12 to 24h. The fermented product is then cooked to obtain Gowé.

According to the third processing technique, the germinated sorghum grains are mixed with non-germinated sorghum and the mixed grains are then milled. One part of the flour is kneaded with water and left to ferment for 10 to 72 h. The rest of the flour is used to make a porridge which is mixed with the fermented paste and left to ferment again for 7h. The fermented mixture is cooked to produce Gowé.

A preliminary re-engineering action on the process was already started with the objective to control the fermentation by using starter cultures of predominant microorganisms isolated during a previous spontaneous fermentation leading to the production of Gowé. The typology of processes is summarized in table 7.

Table 7: Typology of processes

Process	Description	Discussion
Raw materials	Maize, red sorghum, Leaf of *Thalia welwichii* or *Tecktona grandis*	The grains of maize or sorghum must be entire, not damaged, having a big size and being floury; free of stones and weevil. Red sorghum is preferred for Gowé production Sorghum is mainly cultivated in the northern part of the country, but it is sold in all regions of Benin and available in all markets.
Cleaning	Removal of dust, sand, stones and damaged grains The Leaves are well cleaned using potable water	Tedious unit operation Not damaged leaf must be used
Soaking	The grains are soaked in tap water for about 16 h at ambient temperature (28-30°C).	Only 25% of amount of grains need to produce Gowé are soaked. The moisture content of grains after soaking has an effect on the success of germination. Range of moisture content of the grains for good germination is 30-35%.

Process	Description	Discussion
Germination	The soaked grains are spread on the leaves placed on the traditional wicker basket, and then covered with another leaves to reduce dehydration	This step can affect the safety of the product (e.g. level of mycotoxins) and some physical property of the malt (e.g. diastatic power).
Sun drying	The germinated grains are sun-dried for 4 days	Has an effect on the storage duration of the flour obtained after milling
Milling	The germinated grains (25%) and no-germinated grains (75%) are milled separately using a plate disc mill to obtain the malted and the no-germinated sorghum flour	The milling has an effect on the texture of the final product The plate disc mill may be contaminated by other matter because the mill is used to grind other type of product such as legumes, pieces of dried yam etc.
Kneading	A part of the malted grains flour is mixed with the non-malted sorghum flour and tap water, and kneaded into stiff dough	
Saccharification	The mixture is left for a first fermentation (saccharification) of 6 to 10 h at room temperature (28-30°C)	This step facilitate the breakdown of starch into fermentable sugars
Cooking of slurry	A part of non-malted grains flour is used to make a hot slurry (70°-95°C)	The addition of slurry to the mash increases the sugar content of final product
Fermentation	The saccharified dough is mixed with the slurry made and a second fermentation of 10 to 13 h is carried out.	This step is responsible of the sourness / acidity of final product
Cooking of Gowé	Fermented dough is cooked during 40 to 80 min to obtain Gowé	The cooking has an effect on the consistency and the storage duration of final product
Wrapping	The cooked Gowé is wrapped in leaves and then arranged in a container for transportation to the selling points or for sale as hawker vendors	The leaf used for packaging can be a source of contamination of the product The fact that the cooked Gowé is packaged in leaves, coupled with its high moisture content does not ensure a long shelf-life
Sale	Gowé is mainly packed in leaves in the form of a bowl of 75 or 175 g and sold as a paste for the preparation of "ready-to-serve Gowé. At home it is consumed after it is diluted in water; ingredients (milk and sugar) are added if	

Process	Description	Discussion
	wanted to obtain the final beverage Gowé can also be sold as ready-to-drink beverage after dilution in water with added sugar, milk and ice in bottles.	

Source: AFTER research

3.3.3 Services

The services and support necessary to make the chain work included: transportation of raw materials (maize or sorghum) from the buying places to the processing site. Most of time the transportation of maize or sorghum is done by **taxi motor-bike driver** when the quantity of raw materials bought is large.

Another important support service to the functioning of the value chain is the container (plastic or metal tray for transportation) and cup (both metal and plastic to serve Gowé if this latter is sold as ready to drink beverage to consumers), and firewood vendors. Other service suppliers are the millers. Nowadays, none of processors grind the maize at home by using millstone because this labour is hard and time consuming. The **jute sack vendors** are also important for the packaging of maize and sorghum from farm to the market and other selling places. The **intercity car drivers** are also necessary for transportation of maize and sorghum to market and other selling places.

As Gowé is processed by the traditional and informal food sector, the rules related to formal food processing sector are not applied. The reason is that there are no specific rules about the traditional food products. However, the rules concerning the hygiene of processing site and selling places are mostly controlled by the food inspectors from "la Direction de l'Hygiène et de l'Assainissement de Base (DHAB)" of the Ministry of Public Health and "la Direction de l'Alimentation et de la Nutrition Appliquées (DANA)" of the Ministry of Agriculture, livestock and fishery in charge of this type of control. Other supports for official export are the official laboratories in charge of quality control. In the "Union Economique et Monétaire Ouest Africaine" (UEMOA) zone there is free trade of goods; this means that a Gowé processor don't need any permit before exporting, but they have to prove that their product is safe through the report of analysis done on the product by an official laboratory (DANA laboratory) followed by the safety certificate given by DANA which is the only official control service in charge of such activity

3.3.4 Summary of opportunities, bottle-necks, problems and key success factors from value chain analysis

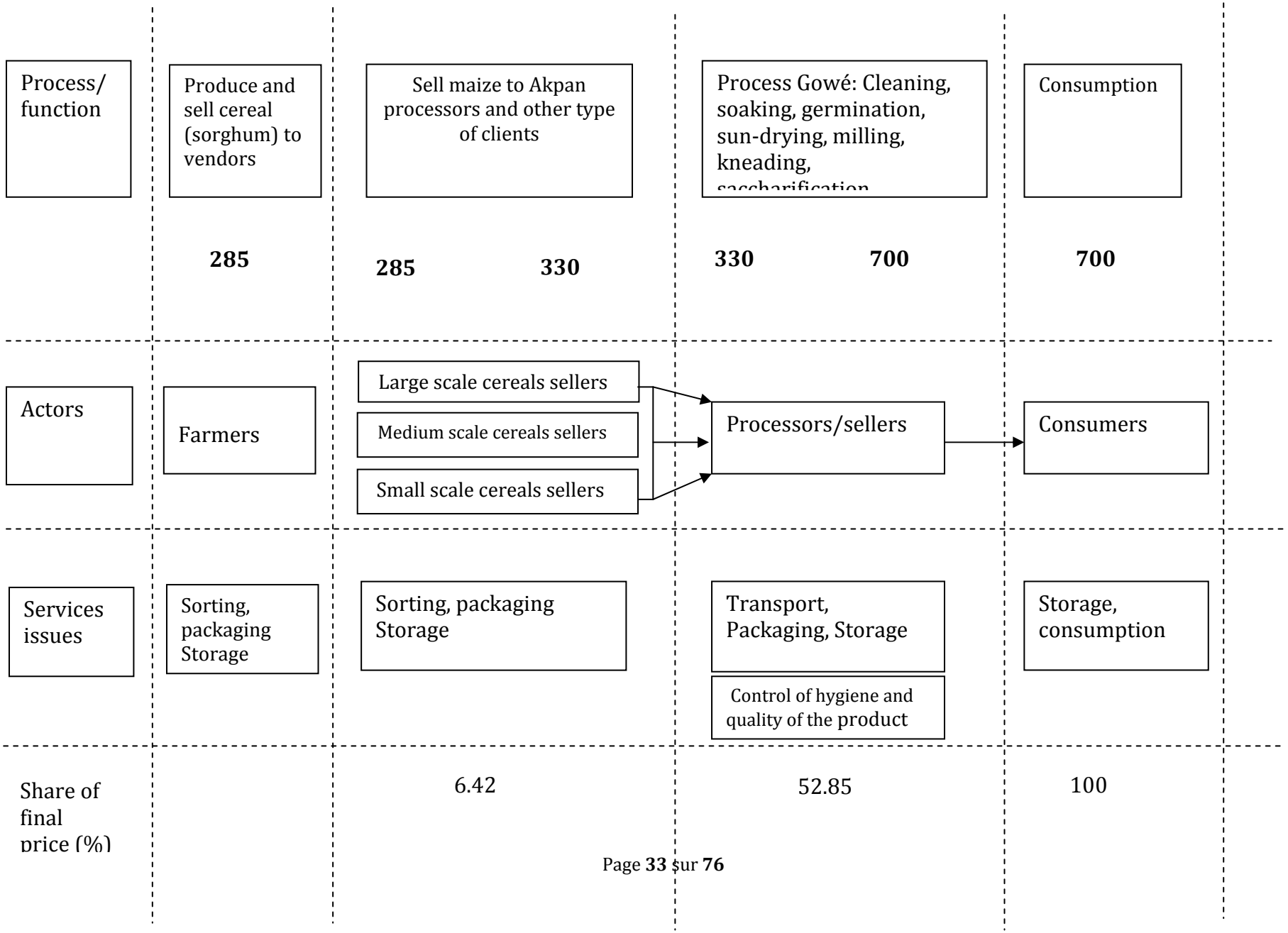
The most important problem related to Gowé processing is the lack of standardization of all the unit operations, mainly the soaking, the germination, the fermentation and the cooking step. For example if the germination is not well achieved, the sweet taste of the final product is low. Other problem is

related to the development of the moulds if the drying is not well achieved after the germination step. Furthermore, either during soaking or germination, the grains can be subjected to the contamination by fungi with potential development of mycotoxins (e.g. aflatoxins). Concerning the milling, the grains must be ground 2 to 3 times to get product of fine particle size. Another constraint is the short self-life of the intermediate (fermented dough) and the final product (3 days at ambient temperature, up to 8 days at 4ºC in a refrigerator); the intermediate product and the Gowé itself become sour during storage. Other constraint is that, the processing method of Gowé from cereal grain to end product is time-consuming. In this respect, the main alternative that will give satisfactory results in terms of improvement of processing and quality of the product is the reengineering of processing method through a number of actions such as the standardization of the malting process, the number of milling to get fine particle size product, the control of the fermentation, the cooking duration of the fermented dough to obtain Gowé and the improvement of the packaging of Gowé which allow a long term conservation of the product. It is expected that all these upgrading actions will lead to the production of new type and safety Gowé with a new presentation to extend Gowé market at national level and perhaps for export.

The target customers are: at national level, both high and low income groups, traditional caterers, street food vendors, restaurants and boarding schools, and other African countries, and Africans in the Diaspora (United Kingdom, France and United States of America) and Europeans (United Kingdom and France) for external customers. The value chain map for Gowé is represented by the figure 6.

Socio economic data collected along the chain during the survey revealed that the sorghum vendors buy sorghum from farmers for 285 F/kg and sell it to processors for 330 F CFA/kg; the processors produce 2.3 kg of Gowé from 1 kg of sorghum and sell to consumers for 700 F CFA and this according to the period of sale; the rough averages share of the final price along the chain are 6.42 and 52.85 % for sorghum vendors and Gowé processors respectively (Fig. 1). This means that the farmers and other actors of the chain share about 40.73 % of the final price of Gowé. Currently Gowé is not exported.

Figure 6: Value Chain Map for Gowé


Process/ function
Produce and sell cereal (sorghum) to vendors
Sell maize to Akpan processors and other type of clients
Process Gowé: Cleaning, soaking, germination, sun-drying, milling, kneading,
Consumption
285
285
330
330
700
700
Actors
Farmers
Large scale cereals sellers
Medium scale cereals sellers
Small scale cereals sellers
Processors/sellers
Consumers
Services issues
Sorting, packaging Storage
Sorting, packaging Storage
Transport, Packaging, Storage
Control of hygiene and quality of the product
Storage, consumption
Share of final price (%)
6.42
52.85
100

3.4 The Marketing Mix

3.4.1 Product

Three types of Gowé made from sorghum are expected to put up for sale after the reengineering: dried Gowé that will be reconstituted before consumption, directly diluted into porridge Gowé (liquid form, e.g. yoghurt-like Gowé) and improved traditional Gowé.

3.4.2 Price

The price of raw materials (sorghum, maize) is the first determining factor in the market mix of Gowé. The prices of ingredients (ice, sugar, milk) and firewood are also determining factors. Generally cost of labour is not calculated in spite of this labour is intensive. According to Gowé processors, sorghum is expensive from April to December and maize from January to June. The selling price of Gowé follows the same variation during the year. Currently, a big ball of Gowé weighing 128-170g cost 50 F CFA while a small one of 73-80g is sold at 25 F CFA; this means that 100g of Gowé cost approximately 35 F CFA.

For the three new types of Gowé, in addition to factors evoked above, the price of competitive product such as Akpan (both the improved Akpan and the traditional one) should be taking into account to fix their selling price. Currently, 100g of traditional Akpan cost approximately 165 F CFA.

3.4.3 Place

Currently Gowé is mainly sold as street food. However, it appeared through the survey that some of consumers would prefer to buy Gowé in a well-packaged form in a supermarket**.** In this respect, there is a potential for Gowé being sold in other African countries and perhaps in some European countries after reengineering. The main selling places are the supermarkets, the restaurant and the target customers are both high and low income groups at national and international levels.

3.4.4 Promotion and dissemination

As indicated above in section 4.1, three new types of Gowé (directly diluted into porridge Gowé (liquid form), improved traditional Gowé and dried Gowé that will be reconstituted before consumption) are expected to be promoted after reengineering. These products will be promoted through a number of actions such as Nutritional information on the packages, radio advertisements, catchy TV advertisements, TV documentary, sponsoring of educational programs to attract the youth (T-shirts advertising Gowé), attractive phrases and participation to international food fairs.

3.4.5. Regulatory situation

As Gowé is processed by the traditional and informal food sector, the rules related to formal food processing sector are not applied. The reason is that there are no specific rules about the traditional food products. However, the rules concerning the hygiene of processing site and selling places are mostly controlled by the food inspectors from "la Direction de l'Hygiène et de l'Assainissement de Base (DHAB)" of the Ministry of Public Health and "la Direction de l'Alimentation et de la Nutrition Appliquées (DANA)" of the Ministry of Agriculture, livestock and fishery in charge of this type of control. Other supports for official export are the official laboratories in charge of quality control. In the "Union Economique et Monétaire Ouest Africaine" (UEMOA) zone there is free trade of goods; this means that a Gowé processor don't need any permit before exporting, but they have to prove that their product is safe through the report of analysis done on the product by an official laboratory (DANA laboratory) followed by the safety certificate given by DANA which is the only official control service in charge of such activity

3.5 SWOT

The strengths, weaknesses, opportunities and threats (SWOT) for improved traditional Gowé and the new version of Gowé are summarized in tables 8. Through the SWOT analysis it appeared that there is a potential to promote Gowé with the reengineering perspectives and this because Gowé production is long tradition in Benin and Gowé is consumed by all classes of people.

The reengineering perspectives will contribute to improve both the new version of Gowé and the traditional one, since a part of the reengineering results will be applied to the traditional sector. The production of good quality Gowé could offer opportunities to attend new markets in Africa, EU and US as well.

Two assumptions are formulated to support this SWOT analysis: a) Types of sorghum used to produce Gowé will always be available; and, b) after re-engineering Gowé can be produced on an industrial scale.

Table 8: SWOT analysis for Gowé production

STRENGTHS	WEAKNESSES
• Long tradition of production of Gowé in Benin • Availability of raw materials (maize and sorghum) • Gowé is consumed by all classes of people • Cheap source of micronutrients	• Food safety issues associated with Gowé e.g. moulds • Short shelf life • Inappropriate processing technology (e.g. spontaneous fermentation, lack of standardization of malting and cooking steps)
OPPORTUNITIES	THREATS
• Use of starters cultures to control the fermentation • Standardize the malting and the cooking by	• Competition from other national products such as improved Akpan, yoghurt and yoghurt like-products

modelling the process • Improve presentation (packaging) • Look for new market for the re-engineered Gowé in Europe among Africans in the Diaspora and among the elite population	• Behavioural changes in elite/youthful consumers • Types of sorghum used for Gowé going into extinction

Source: AFTER research

3.6 GAP Analysis

Currently Gowé is mainly sold as street food but it could be sold sometimes in the open markets which are both an informal market. After reengineering the new products are expected to attend the formal trade market. For this we have to improve the processing method and the safety of the new products as well. The traditional Gowé is known as good microbial quality product since the microorganisms which are involved in the two fermentation steps are lactic acid bacteria and yeasts. However the eventual presence of mycotoxins in Gowé could impact the safety of the product. In this respect, the re-engineering will be done with the objective to overcome the Gap mainly in terms of safety.

3.7 Summary, conclusions and recommendations

Summary

The value chain for Gowé in Benin was mapped. Different actors are associated to Gowé production e.g. the farmer, cereal vendors, the millers, the Gowé processors/sellers, the ingredients (milk, sugar, ice) sellers, firewood sellers and containers vendors. Services from the intercity car drivers, the taxi motor-bike driver and regulation structures are also needed to make the chain work. The main unit operations for Gowé production are the malting, the fermentation and the cooking. The price of final product depends on the price of raw materials (sorghum), the ingredients (sugar, milk and sugar) and firewood used. Gowé is currently sold as street food and in the market.;

Conclusions

After reengineering, Gowé has the potential to be sold in different places such as supermarkets, restaurants and hotels, as well in Benin and outside of Benin. The major problems associated with Gowé production following the traditional technologies is mainly related to the malting process and the control of the fermentation. The malting of sorghum grains is done without any control on the parameters which can affect the success of the germination (e.g. moisture and temperature, etc.). Furthermore, either during soaking, germination or drying, the grains can be subjected to the contamination by fungi with potential development of mycotoxins (aflatoxins).

Recommendation.

1. A preliminary re-engineering action on the process was already started but need to be deeply investigated and tested through AFTER project,

with the objective to upgrade the processing method, improve the sanitary quality and stabilize the product for long term preservation.

2. To support the reengineered product in marketing, there is also a need to provide appropriate information and training to the farmers and cereal vendors for a better storage of grains after harvest and the processors in terms of hygiene for example.
3. The regulatory situation will need to be revisted as the product moves from the informal to the formal food sector

4. Kenkey

4.1 Introduction

This section shows the value chain for Kenkey, a traditional fermented maize product in Ghana. It was compiled by Charlotte Oduro-Yeboah, Mary Obodai, Hayford Ofori, George Anyebuno, Theophilus Annan, Charles Tortoe, Margaret Owusu and Wisdom Amoa-Awua between 6th October and 20th November, 2011.

The value chain analysis (VCA) in this section includes key actors and processes. In addition, the analysis uses the value chain information to build Strength, Weakness, Opportunity and Threat (SWOT) and GAP analyses for existing and re-engineered AFTER products. This information will increase the competitiveness, reduce the costs and improve the market share of Kenkey. The bottom-line of this VCA is that the overall profitability of Kenkey will be improved.

This work builds upon the AFTER survey 'Survey report on production, processing and vending of Kenkey in Ghana' (Amoa – Awua et al., 2011), and the literature search 'Kenkey- background information and Literature Review' (Amoa – Awua and Oduro-Yeboah, 2010). It should also be read in conjunction with the regulatory and market access report 'Regulatory opportunities for White Kenkey in Ghana: A review of the regulatory and compliance environment' (Obodai et al., 2011).

The approach taken involved a Value Chain Workshop organized by AFTER at Mensvic Grand Hotel, Accra, Ghana from 3rd to 5th October, 2011. This was follow up with interviews of key value chain actors listed in Annex 2. Its scope included all aspects of the value chain as far as was possible from the perspective of in-country research. Problems included getting the right source of information from actors to aid in completion of report and conducting the research.

4.2 Product description

White-Kenkey is a salted mildly sour bland tasting stiff porridge with a shelf life of 3-4 days. It is prepared from dehulled maize meal. The maize is either shelled dent maize (*Zea mays indentata* L. and/or shelled flint maize *Zea mays indurata* L). Kenkey produced from dent maize is preferable and can be wrapped in either maize husks or dried plantain leaves. White Kenkey is a ready-to-eat principal meal eaten with sauce and fish but can also be served as a refreshing drink when mashed with water, sugar and milk. It can be eaten at breakfast, lunch or dinner. White Kenkey is sold directly to consumers through informal traders and processors. It is usually sold fresh, packaged in maize husk or dried plantain leaves. It is sometimes sold by street vendors and hawkers at markets and lorry stations and sometimes in chop bars/restaurants. White Kenkey is currently not

sold in supermarkets. The proposed re-engineered white Kenkey targeting the export market will be vacuum packaged. For consumption, the Kenkey may be eaten as such or heated in a microwave oven or by boiling for 30 mins first. Re-heating for thirty (30) minutes will be done by restaurants and individuals that are supplied with the product. Preferably, the Kenkey can be produced in flour form and reconstituted when needed.

Kenkey production is a medium scale activity and a total of about 2,570 tons of maize is processed per week into Kenkey nationwide and sold on the local markets. The Kenkey market is informal and also its export is done informally.

Figure 7: Different forms of Kenkey

		
Branded Ga Kenkey product	Kenkey in maize leaves	Branded Fanti Kenkey
Source: http://www.afro4.me.uk/images/big/G/GhanaBestKenkey.jpg	http://www.bridgeandtunnelclub.com/bigmap/bronx/universityheights/ebeyeyie/02kenkey.jpg	http://www.accrasupermarket.com/product_images/t/fanti_kenkey__31507.jpg

4.3 Value Chain Map

4.3.1 Chain actors and functions

There are several actors in the Kenkey Value Chain and these are as follows:

- Peasant and Commercial Farmers,
- Traders-Bulkers, Ministry of Food and Agriculture,
- Transporters,
- Processors
  - ❖ Primary processors(for shelling during storage of maize)
  - ❖ Traditional processors
    - Maize to Kenkey processors
    - Maize to dough processors
    - Dough to Kenkey processors
- Small and Medium Scale Enterprises
- Input suppliers
- Vendors
  - ❖ street vendors
  - ❖ hawkers

- ❖ office peddlers
- ❖ chop-bars Operators
- ❖ Restaurants

- Consumers.

Peasant Farmers are farmers who cultivate maize on a small scale normally on one to three acres of land. They are found mainly in rural areas and use small farming implements and equipment such as hoes, cutlasses, axes, donkey carts and bullocks. These farmers often face problems with crop infestations, diseases and generally high postharvest loss of crop. They may use traditional and formal agro-chemical for plant fertilization and crop protection. Weed control is however usually manually carried out weeding with cutlass. Commercial Farmers on the other hand cultivate an average of 10 to 20 acres of land using modern techniques of farming including mechanized operations.

Traders are individuals who engage in the buying of maize in large quantities from farmers and distribute or sell directly to consumers. They also transport maize to various markets in the urban areas. Traders tend to hold assets for shorter periods of time in order to capitalize on short-term gains.

The **Ministry of Food and Agriculture**, Ghana also buy maize from both peasant and commercial farmers for storage.

Transporters are service providers who are often contracted by traders to carry maize to various destinations.

Primary processors are also traders, but they buy maize and add value to it by winnowing, drying, sorting and grading. They store the maize and sell during the lean season for more profit.
Kenkey processors fall into three categories namely **maize to Kenkey processors**, **maize to dough** processors and **dough to Kenkey** processors. Maize to Kenkey processors produces Kenkey from raw maize. Maize to dough processors prepare fermented dough from maize and sell it as such without processing it into Kenkey. Dough to Kenkey processor buys fermented dough from the maize to dough processors and process further into Kenkey.

Kenkey vendors fall into three categories: **street vendors**, **hawkers** and **office peddlers**.

- Street vendors are located at permanent places such as markets, lorry stations, schools and along the streets. They display their wares in stalls.
- Hawkers are vendors who carry Kenkey around and sell at markets, lorry stations and schools. They carry the Kenkey on their heads and draw attention of buyers by calling out Kenkey.
- Office peddlers are Kenkey sellers who go from office to office selling Kenkey.

Consumers are people who eat Kenkey. Consumers are mostly Ghanaians but some non-Ghanaians residents in Ghana eat Kenkey as well but these are mostly

West Africans. Kenkey is also eaten by Ghanaians in the Diaspora who purchase the product from special African and Indian shops in their resident countries.

4.3.2 Processes

The main processes in the Kenkey value chain are: production, assembly/bulking, processing, selling and consumption.

The services and support to make the chain work are grading, transportation, bulking and storage, safety, quality, milling and safety. The Value-Chain Mapping of Kenkey showing the production, assembly, processing, selling and consumption is represented in Figure 1.

The Kenkey value chain is itemized as follows: production, assembly, processing, selling and consumption.

The Kenkey value chain analysis starts from the production of maize. The farmers are linked to traders (bulkers, MoFA and primary processors) who buy maize in large quantities. The traders are linked to the processors (maize to Kenkey, maize to dough, dough to Kenkey) who buy the maize and process into Kenkey or various intermediate products. There is a potential for the maize-Kenkey processors and Dough-Kenkey processors to be linked to the European and Diaspora markets. The processors are linked to vendors (street vendors, office peddlers and hawkers) who sell Kenkey. The SME's are linked to consumers and the European markets in the value chain.

4.3.3 Services

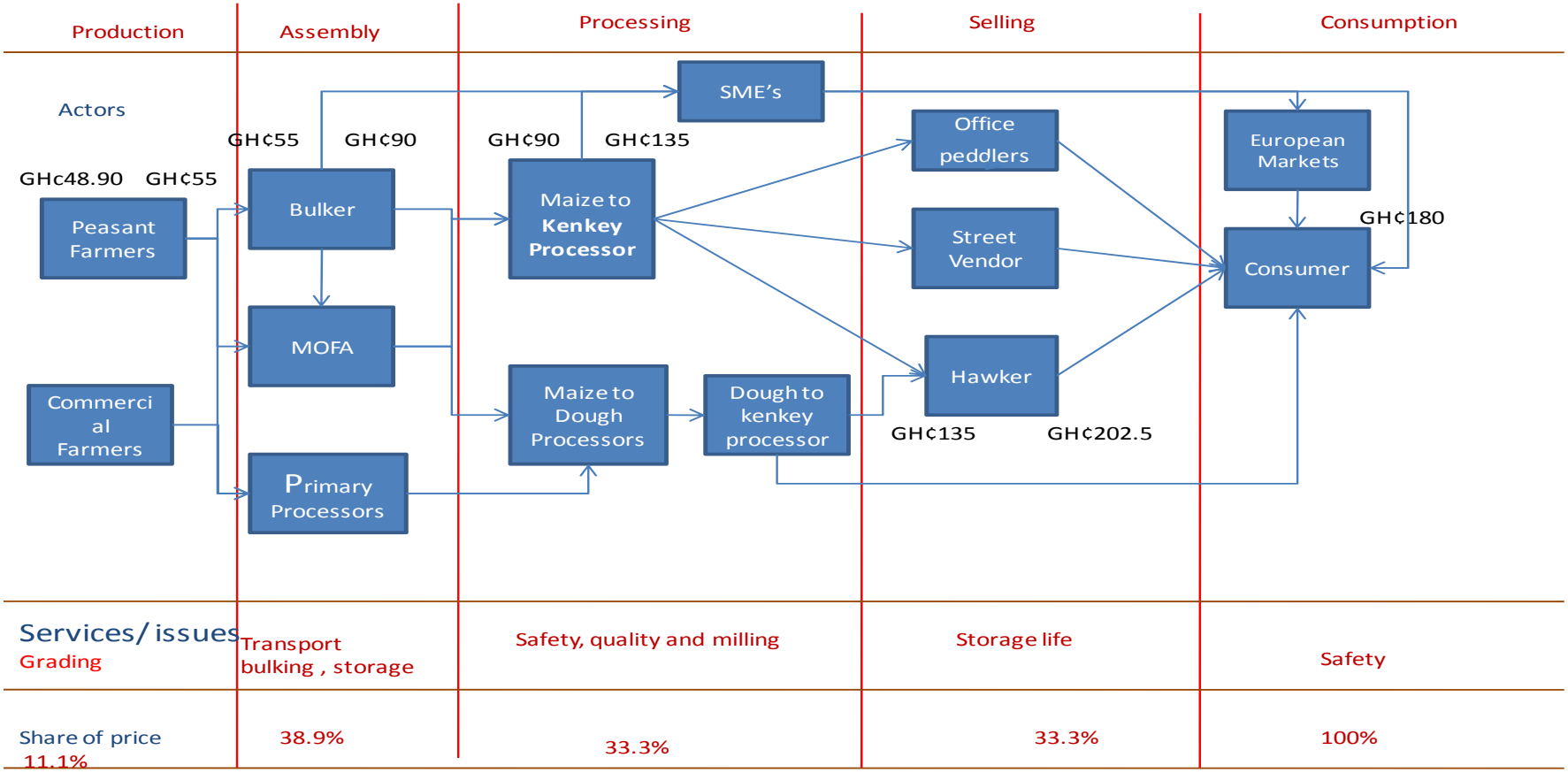
The various categories of vendors are linked to the consumers in the Kenkey value chain. The services involved in the production are winnowing, sorting and grading. This is followed by assembly which involves transportation, bulking and storage. Processing includes safety, quality and milling. Shelf-stability is a problem with selling of Kenkey. The services required for its consumption is the safety of the cooked Kenkey.

The price share for production is 11.1%, assembly is 38.9%, processing is 33.3%, selling is 33.3% and consumption 100%.

The bottlenecks for production and potentially inability to benefit from the value chain by peasant farmers, is the use of manual labour rather than mechanized farming and non-application or use of some inputs (seeds, fertilizers, herbicides and pesticides) due to non-affordability. Peasant farmers farm at a subsistence level and are the least able to benefit from the value chain. Commercial farmers have access to mechanized farming and can afford to apply other inputs such as seeds, fertilizers, herbicides and pesticides to obtain better yields. The main problems they face are with marketing of maize especially in the peak season when prices are low. High quality maize free from aflatoxins, dirt, moulds and other foreign materials attracts better price than poor quality maize.

The problems processors encounter includes variations in the price of maize during the year. Processors need access to use high quality maize free from aflatoxins, dirt, moulds and other foreign materials. Duration for fermentation of the maize is long and the traditional processing procedure leads to variability in the quality of Kenkey. The process can be improved by the use of starter cultures that will reduce the fermentation time and produce products of consistent quality. Additionally, cracking of maize grains will increase the surface area for water inhibition during steeping and facilitate softening of the grains. The use of hot water for steeping could also reduce the steeping time. The use of pressure cooker will reduce cooking time.

Figure 8: Kenkey value chain map



Vendors face problem with the shelf-stability of Kenkey. Vacuum packaging has the potential will greatly to improve the shelf stability of the product but issues of cost will need to be explored and other markets such as the supermarket sector may need to be explored. The use of sausage casing rather than leaves will improve the image of the product but the product will lose it access to the vegetarian market.

Consumers are concerned about the safety of Kenkey. The Kenkey should be hygienically prepared and free from mycotoxins (aflatoxins and ochratoxin A).

The different support services in the Kenkey value chain are grading, transport, bulking and storage, safety, quality and milling, storage life and safety.

Maize used in the production of Kenkey should be of high quality. The harvested maize is sorted first, this means dirt, husk and other foreign materials are removed and the maize is graded according to size. The graded maize has a higher price because of the value added.

Traders buy maize from farmers in large quantities (to reduce costs and increase their share of the value because they re-sell at exorbitant prices) and transport them from rural areas to urban centres where they are stored. During the processing of maize, the safety and quality of the intermediate products are very important. The processors by experience have techniques like washing the utensils very well and using potable water in order to obtain good quality kenkey.

The shelf-life of Kenkey is an important factor in the value chain of the product. The product has a low pH of less than 4 which suppresses the growth of pathogenic organisms but nonetheless the shelf life is short at 3-4 days because of its moisture content of 52-55% and storage at ambient temperature (24 to 35^{o}C).

Farmers pay GH¢150 for seed, tractor and other inputs for 1 acre of land which yields 15maxi bags with Good agricultural practices. The selling price of maize at the farm gate is GH¢55 per 100kg. Traders buy the maize at GH¢55 and sell it for GH¢90. Processors buy the maize at GH¢90 and sell at GH¢135. Vendors buy Kenkey for GH¢135 and sell at GH¢135.41. These values were arrived at using the formula below:

Retained value: Sale price – buying price
Percentage of final value: retained value/sale price

The price share for production is 11.1%, assembly (38.9%), processing (50%), selling (0.3%) and consumption (100%).

Quality Specification for Kenkey:

Maize used for Kenkey production should be whole clean high quality grains free from aflatoxins, dirt, moulds and other foreign materials with a moisture content of 10%. Processors usually assess the moisture of the maize they purchase by biting with their teeth. Kenkey is a salted sour tasting stiff porridge with moisture content of between 52-55 %, pH of 3.7 and a shelf life of 3-4 days prepared from fermented maize meal. Kenkey as analysed by a competent laboratory should contain less than 100 foreign mesophilic bacterial colony forming units per gram, less than 100 mould colony forming units per gram and pathogenic bacteria should not be detected in 25g of the product whilst aflatoxins are not present at levels exceeding 10 parts per billion. It is eaten as a principal meal with sauce and fish but can also be served as a refreshing drink when mashed with water, with sugar and milk added.

The shelf-life of white Kenkey will be extended by using an appropriate packaging and vacuum packing for preservation. Cracking of the grains will reduce steeping time. The use of pressure cooking will reduce the cooking time.

Use of starter cultures will reduce fermentation time, produce more consistent quality product and give a greater assurance of the safety of the product.

These innovations will reduce the duration of processing for production of Kenkey and produce a safer product of a more consistent quality.

Gender of Actors in Value-Chain of Kenkey is represented in Table 9 below.

Table 9: Gender actors in the Kenkey value chain

Actors	Gender
Production	
• Peasant Farmers	Male and Female
• Commercial Farmers	More males than females
Assembly	
• Traders	Mainly Females
• Bulkers	Males
• Primary Processors	Males and Females
Processing	
• Maize to Kenkey	Females
• Maize to dough	Females
• Dough to Kenkey	Females
• SME's	Females
Selling	
• Street vendor	Females, less males
• Hawker	Females
• Office peddlers	Females
Consumption	
• Consumers	Males and Females

Source: AFTER Research

4.4 The Marketing Mix

This marketing mix has been developed specifically for White Kenkey.

4.4.1 Product

White-Kenkey is a salted mildly bland tasting stiff porridge with a shelf life of 3-4 days. It is prepared from dehulled maize meal. It can be wrapped in either maize husk or dried plantain leaves. It is a ready-to-eat principal meal eaten with sauce and fish but can also be served as a refreshing drink when mashed with water, sugar and milk. It can be eaten at breakfast, lunch or dinner.

4.4.2 Place

- Restaurants
- Supermarkets
- Street Vendors and Hawkers
- Chop bars

4.4.3 Promotion

- Television documentary
- Print media
- Radio Advertisement
- Bill boards at vantage points
- Food fairs
- Collaboration with SMEs e.g.. Neat Foods Company Ltd, Ghana.
  Catchy phrases
    - White attractive Kenkey
    - Hygienically packaged Kenkey
    - Longer shelf-life
    - Convenient for field workers
    - Convenient for Office workers

4.4.6 People

- Adults
- Youth
- Weaning foods
- Convalescence
- Both high and low income groups
- Educational institutions
- Africans in the Diaspora

4.5 SWOT

This SWOT analysis is for both ga and fanti Kenkey.

Table 10: SWOT analysis for ga and fanti Kenkey

Strengths	**Weaknesses**
• Product is well known • Complicated processing procedures can be used as a business opportunity • Ready-to-eat • Can be eaten anytime of the day • Safe due to low pH • It's cheap • Satisfying • Can be consumed as stiff or thin porridge • It's patronized by all • It's production is profitable	• It has an acquired taste • It has a variable texture • Primitive packaging • Short shelf-life • Associated with ethnic groups • The product does not appear to have any unique nutritional and sensory advantages
Opportunities	**Threats**
• Novel Product to new-consumers • Amenable to re-engineering to increase the shelf-life, reduce food safety concerns and improve the consistency of the quality • Scientific Knowledge e.g. use of starter cultures can be exploited • Can be fermented with probiotic bacteria • International market can be explored • Diaspora market • Shelf-life can be extended by canning, vacuum packaging, addition of sweeteners and storing at lower temperatures	• Food safety - may contain mycotoxins especially aflatoxins • Lack of traceability of raw material with existing VCs • Leaching of heavy metals such as lead into Kenkey from cooking pot (traditional process). • Competition with other African foods • Changing food habits • Price of reengineered product may be too high

Source: AFTER Research

This analysis was made using the following assumptions: that the ga and fanti Kenkey can be produced on a large scale, that there is a sufficient and regular supply of maize, and, that the price of maize remains fairly stable.

The following SWOT analysis is for white Kenkey

Table 11: SWOT analysis for white Kenkey

Strengths	**Weaknesses**
• Complicated processing procedures can be used as a business opportunity • Ready-to-eat • Can be eaten anytime of the day • Has milder taste and easier to sell than kenkey or banku • It's cheap • Can be consumed as stiff or thin porridge • It is patronized by all • It is profitable • It is more attractive	• Has acquired taste • Variable texture due to processing • Primitive packaging • Product is not very well known compared to Ga and Fanti kenkey • The product does not appear to have any unique nutritional and sensory advantages
Opportunities	**Threats**

• Novel Product to new-consumers • Amendable to re-engineering to increase the shelf-life, reduce food safety concerns and improve consistency of quality • Shelf-life can be enhanced by addition of sweeteners, vacuum packaging, storing at lower temperatures. • Scientific knowledge can be exploited • European market can explored • Diaspora market	• Could contain mycotoxins • Lack of traceability of raw material with existing VCs • Access to markets • Changing food habits • Competition with other African foods. • Leaching of lead into Kenkey from cooking pot. • Price of reengineered product may be too high

Source: AFTER Research

The assumptions for white Kenkey are: that the business opportunity is not too complicated to exploit, that maize supply is assured and that prices for maize remain relatively stable.

It can be deduced from the SWOT analysis that Kenkey is a well-known product in Ghana which is patronized by a large section of the society. Kenkey is affordable. The complicated processing procedure can be used as a good business opportunity, since consumers hardly prepare it at home. Kenkey making business is very profitable. The product can be consumed in two forms, as a stiff or thin porridge. The short shelf-life and the primitive but natural packaging material are issues that need to be addressed during re-engineering.

The product is a novel product to non-consumers and is amendable to re-engineering. The shelf-life of Kenkey can be extended by vacuum packaging and its image improved using an appropriate packaging material instead of plantain leaves or corn husk for packaging the Kenkey balls. Starter culture could be used to reduce the fermentation period. Contamination of Kenkey with aflatoxins is an important issue since it is very difficult to trace the source of the maize used for Kenkey preparation. White Kenkey can favourably compete with other African maize products such as Ogi and Mawe

4.6 GAP Analysis

The GAP analysis for the types of Kenkey and its derivatives are presented in table 12.

The competing products are banku (fresh and instant), fufu (fresh and instant), kafa, rice, omo-tuo and *Tuo zafi.* The product will move into the market space through promotion such as Television documentary, print media, Radio Advertisement, Bill boards at vantage points, Food fairs and collaboration with SMEs e.g.. Neat Foods Company Ltd, Ghana. Catchy phrases such as white attractive Kenkey, hygienically packaged Kenkey, shelf stable Kenkey, convenient for field workers and convenient for office workers will be used to promote the product. Consumer acceptance studies will also enable its promotion based on taste.

Table 12: Gap Analysis- Kenkey and its derivatives

	Product 1 White Kenkey- stiff dough	**Product 2 Mash white Kenkey- bottled**	**Product 3 Fanti Kenkey**	**Product 4 Mash Fanti Kenkey**	**Product 5 Ga Kenkey**	**Product 6 Mash Ga Kenkey**
Market 1	Diaspora Market / European	Supermarkets	Diaspora Market/ European	Supermarkets	Diaspora Market / European	Supermarkets
Market 2	Chop bars	Restaurants	Chop bars	Restaurants	Chop bars	Restaurants
Market 3	Supermarkets	Street Vendors	Supermarkets	Street Vendors	Supermarkets	Street Vendors
Market 4	Street Vendors	Diaspora Market/ European	Street Vendors	Diaspora Market/ European	Street Vendors	
Market 5	Restaurants		Restaurants	Street Vendors	Restaurants	
Market 6	Offices peddlers		Offices peddlers		Offices peddlers	

The supermarket has been highlighted because it has the greatest potential for Kenkey and its derivatives.

4.7 Summary, conclusions and recommendations

The bottlenecks for maize production by peasant farmers is reliance on manual rather than mechanized farming and lack of use of inputs such as certified seeds, fertilizers, herbicides and pesticides. Peasant farmers do subsistence farming but commercial farmers who employ mechanized farming on large scale encounter problem with marketing of their produce.

Processors are faced with the problem of variations in the price of maize throughout the year. There is the need for processors to use high quality maize free from aflatoxins, dirt, moulds and other foreign materials. The duration for fermentation of the maize is too long and the traditional processing of Kenkey leads to variability in the final product quality. Use of starter cultures will reduce the fermentation time and produce standardized safer products. Cracking of maize grains will increase the surface area for water inhibition to enhance softening of the grain. The use of pressure cooker or retort will reduce the cooking time.

Selling of Kenkey is affected by the short shelf-stability of the product. Vacuum packaging will greatly improve the shelf stability of Kenkey but the margins may be reduced.

Kenkey consumers are concerned about the safety of the product. Kenkey should be hygienically prepared and free from mycotoxins.

The different support services in the Kenkey value chain are grading, transport, bulking and storage, safety, quality and milling, storage life and safety.

Maize used in the production of Kenkey should be of high quality. The harvested maize is sorted: dirt, husk and other foreign materials are removed and the grain

graded according to size. Graded maize has a higher price as a value added product.

Traders buy maize from farmers in large quantities and transport them from rural areas to urban centres where they are stored. During Kenkey production safety and quality of the intermediate products are essential.

Production of aflata during Kenkey production is essential to obtain the required texture. The shelf-life of Kenkey is an important factor in the value chain of the product. Kenkey has short shelf- stability because of its high moisture content of 52-55% and storage at ambient temperature (24 to 35^{o}C).

In conclusion, Kenkey microbiology will involve the development of starter cultures from lactic acid bacteria and yeast responsible for the fermentation of the dehulled maize into 'white Kenkey'. Also in depth knowledge of the technological properties of the lactic acid bacteria and yeast and the microbial and chemical changes that occur during fermentation will enhance the production of better quality and standardized white Kenkey suitable for the local supermarket, diaspora and European market.

5. Kiskh Sa'eedi

5.1 Introduction

This section on the value chain analysis for Kishk Sa'eedi (KS) in Egypt was completed by Habiba Hassan Wassef between November 2011 and January 2012.

The purpose of the report is to scope out and reveal the value chain for Kishk Sa'eedi, with its key actors and processes. In addition, the analysis uses the value chain information to build SWOT and GAP analyses for existing and re-engineered AFTER products. The work builds upon the Technical Report of the AFTER survey undertaken for "Identification of quality attributes of Kishk Sa'eedi (Deliverable 1.1.2.1-3) and the KS literature review (Deliverable WP 1: M1.1.2.1, M1.1.2.2). It complements the regulatory and market access report (Ref.: "Regulatory opportunities for Kishk Sa'eedi in Egypt: A review of the regulatory and compliance environment", September 2011)

The methodology was introduced during the value chain training workshop organized in Accra on 4 and 5 October 2012, and was further elaborated following interviews with some key national value chain actors (see Annex 5 for list of actors interviewed). Its scope covered all aspects of the value chain as far as was possible and from the perspective of available in-country research. The particular feature of the KS product is that it had never been a focus of interest for researchers. Limited to a home-based production process that is seasonal and practiced in a limited geographic area, only a very small portion of the total production reaches the market. KS has never been produced and marketed on a commercial scale.

The present value chain analyses draws on the above mentioned AFTER project quality attributes survey and on an earlier study of KS production that was initiated in El Minia in 2004 by the NRC investigators (report produced in 2004 on 'The production of Kishk Sa'eedi in Egypt' by Ahmed ZS and Hassan-Wassef H, is not yet published). In fact, since that date, information on the potential for production and marketing (local and abroad) continued to be investigated. This explains that dates given for the interviews are earlier than the date of the present report. In fact, KS promotion activities have since jointed the national programme for valorisation of the Egyptian food heritage. Since 2010, Egypt has joined and benefited from the Euro-Mediterranean programmes for promotion of the Mediterranean Diet Food Heritage and the global initiative led by FAO for Sustainable Diets based on local food systems. KS occupies a privileged place in both programmes.

Contrary to other traditional African products under study in AFTER, most of which have already gained access to local, regional or even international markets, the Upper Egyptian KS is unknown even to those southern Egyptians who live outside its production area. The broader consumer acceptance

(national as well as international) and the market response to the KS and to its derivatives constitute an unknown entity that remains to be discovered in the course of the AFTER project. The novelty and uniqueness of this hitherto unknown traditional food technology is not regarded as a drawback. On the contrary, it is considered an asset that can be exploited to support the promotion and marketing of an improved quality product that is also safe.

This section starts with describing the product, followed by the Value Chain Map that details the actors, processes and services that are implicated at various points across the production chain, from the farm to the consumer. Analysis of the Value Chain provided information that allows the identification of potential opportunities and indicates the bottle-necks to avoid, and more importantly, the key success factors to be enhanced. Section 4- reviews the marketing mix of Product, with Price, Place and Promotion (the 4P's). This is followed by a SWOT Analysis exercise (Strengths, Weaknesses, Opportunities and Threats) for KS and a Market Gap Analysis. The summary and conclusion are given under Section 7 along with some recommendations relevant to AFTER project implementation.

5.2 Product description

5.2.1. The product

Kiskh Sa'eedi (KS) is a homemade indigenous cereal-based fermented food that has survived the test of time. It is made by first fermenting the required amount of buttermilk[1] which is referred to as *"laban zeer".* The second fermentation takes place after mixing the fermented milk with freshly harvested whole grain wheat that had been parboiled, dried and coarsely crushed. The final product is then shaped into small rounded balls or roughly cut into unshaped nuggets and sun dried. The dry KS balls/nuggets are stored in sealed earthen-ware pots and have a shelf life of one year. For consumption, though it can be munched in the dry state, KS is mostly reconstituted in a little water to be consumed as a drink in the morning, or to be cooked in a variety of recipes. Prepared in a number of different ways, it can be served at any of the three main meals.

One of the unique features of *KS* is that it can be eaten at all stages of its production. Diluted *Laban Ze*er is consumed in summer on its own as a refreshing drink. The *hama* (the fermented mixture of *Laban Zeer* and parboiled ground wheat) is consumed as a sour paste for breakfast or as a semisolid mash as an accompaniment to vegetables and egg dishes. The dried balls/nuggets can be eaten as a snack and are a popular school snack for Upper Egyptian children.

Dried KS balls/nuggets can be reconstituted by soaking in water and consumed as a hot gruel. Vegetables, eggs, spices, or dates can be incorporated into the gruel. KS can form the core ingredient in savoury and sweet dishes. Two KS

[1] Buttermilk is the milk that remains after churning out the butter.

balls soaked in a glass of water is the first drink on waking up in the morning for many Upper Egyptian women.

The preparation of cooked dishes incorporating KS varies by geographic district. However, the dominant preparation method used for KS in Upper Egypt is in soups and stews. It can be cooked with meat or poultry as a kishk Sa'eedi stew. For households with limited incomes, a few KS balls thrown in the cooking pot serve as a meat substitute in the preparation of the daily vegetable stew. A typical breakfast for millions of Upper Egyptian is dipping few KS balls/nugget dipped in their tea.

Egyptians consume *KS* at all meals under different forms of preparation and it serves as the food of choice for the sick. Prepared in a number of different ways, it can be served at any of the three main meals and between meals as well.

5.2.2. Forms that the product takes on the market

KS is a (rural) home based product and is destined principally for the family and extended family. It is also distributed as a gift to friends and relatives living outside the KS producing governorates; hence there is very limited market distribution for KS. The KS that finds its way to the market is sold in shops of vendors of grains and dried legumes referred to as "Allaf", or are sold by individual street vendors. The latter may be a regular vendor (mostly women) representing producers in his/her family and or village or an occasional vendor selling own produce. The supply of KS for the Allaf is through individual producers. Hence the type and quality is expected to vary due to local variations in the production process that is particular to each governorate. The unpacked dried small balls or unshaped nuggets of KS are exhibited in a sac or a woven reed basket. The product rarely reaches the markets in cities of the northern Delta region. In the capital city of Cairo, it may be found in popular markets on the left bank of the Nile (the Giza neighbourhoods of Greater Cairo). The commercial or Sooky KS found in the market is sold by weight (kg), by volume using empty cans and/or by number i.e. Toura which is 4 KS balls or nuggets. The price of Sooky KS ranges from 5-10 LE/Kg (equivalent to 0.9 to 1.8 USD). The KS price increase during winter and can increase when a superior home or Beity quality of KS is offered for sale.

KS is exclusively served in homes and does not figure on the menu of eating places or restaurants. The market demand is negligible outside the producing governorates of the south or "sa'eed", as those consumers who seek KS can usually arrange to receive it from their southern relatives and friends – usually without paying for it.

5.2.3. The size of the market for KS

KS is an informal home based product and occupies no more than a small niche in the market. Though the total KS production in Egypt can be measured in tonnes, the market turnover is in kilograms because most is either consumed in-

house or gifted. The market demand is modest with a limited informal commercial circuit. Precise information on the size of the market in the Governorate of El Minia will become available once the product survey results (AFTER survey) are processed. KS is not in demand except by those who are familiar with it. It is consumed by the *Sa'eedis* in their original environment or it reaches them (wherever they are, in Egypt or abroad) in the form of a gift through a closed circuit of family and friends and in quantities of that depend on the size of the family and the resources available to the producer. Commenting on the quantity of KS commercialized annually, a KS vendor replied with a wide range of quantities extended from 25kg per season up to 2000 kg. This reflects the wide range of quantities offered for sale rather than the demand. It is also an indication of the informal marketing and distribution channels (e.g. street vending, village weekly markets, or shop offering KS all the year round.

The quantities offered for sale in a shop or by an individual vendor can be about 30 kg or more. The trading of KS is predominantly a feminine business. Almost all traded *KS* (96.4%) is produced with the primary intention of commercial exploitation, i.e. produced at home to be sold on the market. Whereas, only (3.6%) of the *KS* on the market is either a surplus that remains from the product intended for home consumption; or the producer is selling some of its own KS to generate additional income for the family. The *KS* destined for commercialization i.e. the *Sooky* is usually perceived to be of inferior quality when compared to the KS that is produced for home consumption i.e. the *Beity.* Shortcuts in preparation time and cost containment changes in the raw materials and ingredients used may be resorted to for reducing the production cost and time when producing for the market. The KS *Sooky* clients are usually those who are living outside the KS producing area, or those who cannot afford to produce KS at home or who exhausted the stock of KS received from their families, relatives or friends.

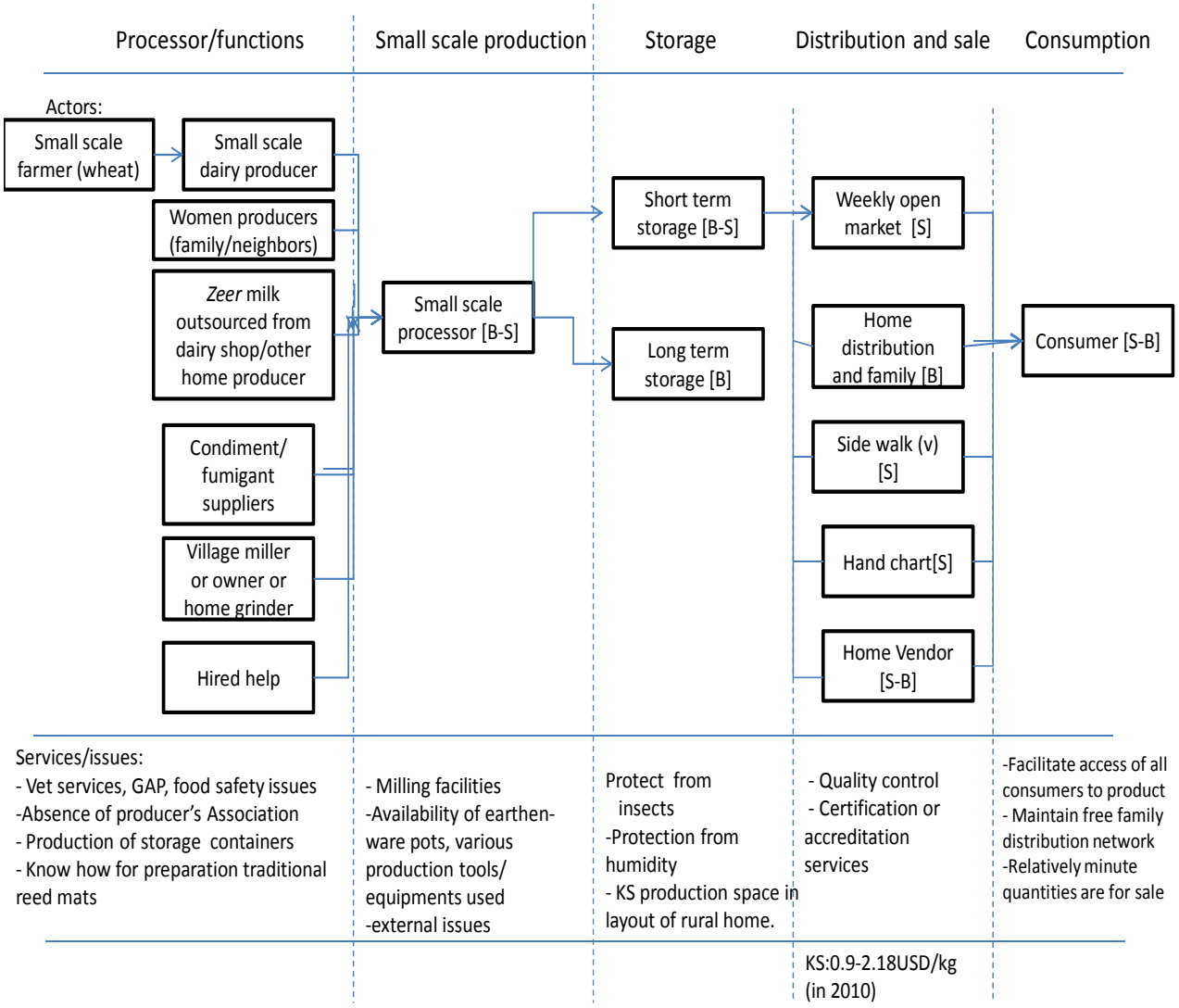
The survey results showed that more than four fifth of the KS traders (handling the 3.60% of the total volume of KS production that reaches the market) reported that they receive the KS directly from the producers. The remaining 12.5% reported that they received the product through KS collectors who collect the product from various producers.

5.3 Value Chain map

5.3.1. The main chain actors, their functions in the production process

The Value Chain map (Figure 9) lists the main actors and their function in the production processes of KS, or for supply of primary raw materials and other products or equipment used in the production cycle. The first actor is the small scale farmer cultivating and harvesting the wheat and separating the grains; the home or small scale dairy producer; the dairy products supplier; vendors and or suppliers of condiments and fumigants; the village miller or the owner of a home grain grinder; the potter producing the various earthenware pots used in KS

production cycle; the producer or vendor of reed or other mats for sun drying; the vendor of condiments and fumigants. The following table summarizes their roles and functions, giving the end product for each function. The process of KS production is mainly the domain of women. Table 13 hereunder, shows the relation of the actors to the phase of the production process and the end product of that phase.



S = *Souky* or commercial quality KS B= *Beity* or home quality KS
Zeer milk= the fermented milk

Table 13. Value Chain Actors

Actor	Function in production process	End product
Farmer	farming - wheat production	local wheat grains
Women producers	home milk production - milk animals	raw milk
Women producers	churn milk to remove butter	buttermilk
Women producers	ferment buttermilk → home *laban zeer*	*laban zeer (LZ)*
Supplier dairy products	ferment milk →commercial *laban zeer*	*laban zeer (LZ)*
Supplier of salt	added with each addition of buttermilk	*laban zeer (LZ)*
Women producers	wash and parboil wheat	coarsely crushed grains
Women producers	drain, dry parboiled wheat in the sun	dry grains ready to mill
Village miller	coarse milling of parboiled wheat	coarsely ground grains
Owner of grain grinder	"	"
Women producers	remove fine flour by sieving	flour-free crushed grains
Women producers	mix *LZ* with wheat and leave to ferment	fermented *hama**
Potter	make earthenware pots	Many sizes & shapes for KS
Reed mat producer	mat maker - collect/attach reeds	mats for sun drying KS
Vendor of mats	mat vendor - sale of woven mats	different types can be used
Women producers	prepare *hama* for shaping balls/nuggets	*hama* & condiment mix
WP &Relatives/neighbours	shape balls/nuggets& arrange on mat	sun dried KS
Suppliers condiments	sale of condiments sell condiments	cumin , chili, salt
Suppliers of fumigants	collect/procure/sell fumigants	fumigant herb mixture
KS collector	buy KS for resale - marketing agent	commercialize KS
Street KS vendor) Hand cart KS vendor) Shop KS vendor)	sell KS	KS reaches market
Home cook	prepare KS dishes - cooking KS	KS alone or in cooked dishes
Chefs	create modern cuisine recipes for KS & adapt KS to global consumer preferences	KS is accepted by global consumer

* *Hama* is the name given to the product of the second fermentation process, the fermented wheat-milk mix.

The following two tables, Table 14 and Table 15 further examine the typology of actors and of processors. The gender distribution for the different actors is noted with an 'F' for women and an 'M' for tasks undertaken by men. The 'B' identifies the home made KS or *Beity*, and 'S ' indicated the commercial quality or *Souky* KS.

Table 14: Typology of Actors (by production phase or

Actors	Role, Responsibility and Rights	Discussion, Important points, aide mémoire
Milk		
Small scale producer (SSP) -own milk (F) -Milk from the extended family -Purchased milk -Dairy product shop-producing (M) outsourced *zeer* milk	Milk the animal Ferment the milk in *zeer,* skin, plastic container (40 days-4 months)	Only winter milk is used Process is repeated until required amount is reached Outsourcing *zeer* milk may be linked in final product of KS
Zeer milk substitute used in production of *Souky* KS (S)		This is poor quality for *Souky* KS
Wheat		
Farmers from family of SSP Small scale producers Miller in village mill Home owned mini-electric grinder In family or neighbour's house SSP (F)	Grow and harvest the wheat (M) Parboil, drying in the sun (F) Coarse grinding (M) Sieved to remove the fine flour (F)	Only Egyptian breeds of wheat used exact breed to be verified
Mixture (Hama)		
   Casual labour if needed Condiments provider Women of family/neighbours	Mixing *Zeer* milk and coarse wheat (F) Ferment (1 day) (F) Knead (casual labour) and mix with condiments (F/M) Shape nuggets/balls	Egyptian wheat only Parboiling, cut off point is important Sieving, important step Fermentation done in an enclosure Pot is covered with blanket to allow for maximum production
	Cut reeds from the banks of the Nile (M) Prepare the reeds for mats (F) Sun drying of balls/nuggets on reeds (F) Prepare containers for storage and put fumigating herbs inside (F)	
Type of Vendor (V)		
Distribution within family (as a gift) [Beity KS (B)] Home V [B] Sidewalk V [B or S] Hand cart V [S] Shop-V [S and B] Weekly open market [S]		Commonly replaced by plastic matting On roof top in direct sunlight Long term storage in sealed fumigated containers

Source: AFTER Research

Table 15: Typology of Processors

Process	Description	Discussion

Process	Description	Discussion
Milk cow or buffalo	Home/family owned animal milked by small scale processor (SSP)	Animal may be kept in a common 'barn' under traditional sharing-of-returns modality
Churn milk to remove butter	Traditional goat skin is used. Innovators use drum of old washing machine models	Churning technology differs and is observed to evolve, becoming mechanized
Fermentation of milk in *zeer* or in an alternate container	Continued with additions of fresh buttermilk & clean coarse salt till required consistency/amount is reached	40-days to 4 months, use milk of cow or buffalo. Protect against use of cheap and unclean fraudulent salt
Harvest the wheat Parboil wheat Sun dry the parboiled grains Coarse grinding Pass through sieve to remove fine flour	 In open air on wood or gas fire Dried on mats laid on ground Village mill or use personal/ neighbour's home grinder Traditional animal gut sieve often replaced by metal mesh	Special local strains are used Source of heat can be improved Drying space to be protected This is a paid task at the mill Traditional sieves are rare, their use is shared between families
Mix *zeer* milk and wheat		
Ferment wheat-milk mixture Knead and mix in condiments	Ferment in a darkened room A strenuous task which may be given to a male hired help	 Procure condiments
Prepare mat from Nile reeds		Reeds need to be well washed
Cut into nuggets/balls	Laid in rows on mat	Team effort of family/neighbours
Dry in sun on mats		Sun exposed protected roof area
Clean and prepare storage containers	Earthenware container is washed, dried and treated	Procure fumigants
Store (long term) in unglazed earthenware containers	Fill, close and seal treated containers	Storage on the roof top in direct sunlight

Source: AFTER Research

5.3.2 Processing

The reader is referred to the two background documents cited in the introduction, namely the KS literature review and the survey report for detailed information on the production process and the actors. The table hereunder is not exhaustive, and lists the main processes and the services and support needed at a particular phase of the production cycle, as well as the issues that present themselves at each step or phase of the process. Some of the services have to be paid for or hired help is resorted to. However, KS production is essentially a family based activity. Production teaming together for collective tasks is a tradition among family and neighbours. This traditional system of exchange of services within an extended family, neighbours and or community continues to operate in the case of KS. Calculation of the cost of production for KS will need to place a figure on all this system of family and community inter-aid and reciprocal task sharing.

Table 17. The production processes, support or services needed, and related issues

Main processes	Services/support needed	Issues
Wheat production	Availability of correct local wheat strains; contain cost of farming inputs and services e.g.	Protection against mycotoxin infection; preservation of the local wheat species used for

Main processes	Services/support needed	Issues
	through collective procurement; ensure safety of irrigation water;	KS; serious effort needed for protection of irrigation waters and soil from contamination
Milk production	Problems facing home based milking animal ownership milk production need to be studied and support provided; improve vet services in coverage and quality; guarantee safety of milk.	Poverty, small size of land parcels; high cost of fodder; are all threatening the family ownership of a milk producing animal. Issue needs to be urgently investigated; the health and safety of the cow/water buffalo
Churning to remove butter	Support evolution of innovative technologies improvised by families	Opportunity for improving current technology used
Milk fermentation (*laban zeer* production)	Set and promote hygienic standards for safety of this stage of the production cycle, especially of the commercial *laban zeer;* Supplier of clean sea salt	Study the variations met with in this stage of the KS production; the purity and safety of the salt used. Source and safety of salt used
Preparation of crushed parboiled wheat	Learn from the variations observed in the survey on how the parboiling is managed and seek consensus of the most environmentally friendly method	The container used for parboiling and the source of heat
Fermenting wheat milk mixture	The relative merits/drawbacks of the materials from which the fermenting containers are made and which were observed in the survey need to be investigated and guidance provided based on collective consensus	Great variation observed, also alternate options need to be recommended in case of shortfall in production and availability/affordability of the of the traditional earthenware containers or "*magour"*
Preparation of mixture for shaping	Collection of details of the variations in the proportions of condiments used	This phase may be open to innovation; the "hama" can lend itself to new derivatives
Shaping of balls and nuggets	The merits claimed for the different variations in size and shape may need to be verified	The "ball" and the "nugget", which is preferred, and why?
Sun drying	Identify appropriate technology to accelerate the drying process and protect exposed balls/ nuggets from contaminants	This is a several days process that exposes the product to dust and unforeseen sources of contamination
Preparation of storage pots	Verify that there are no residues left from the fumigation process that are not admissible by European and International safety norms.	The herbs and other materials used in this process are familiar only to the users.
Storage		Methods of storage of KS are related to climatic conditions, to the habitat design, space for KS production—evolution in home design and use and change in way of life that is

Main processes	Services/support needed	Issues
		changing. In addition to identifying modern storage techniques for shelf storage of the improved commercialized traditional product, all home production processes need to be re-examined in the light of enhanced safety and quality, cost containment, economy of time and effort; and environmental friendliness.
Distribution of gifts to relatives and friends	Encourage continuation of this habit – a manifestation of social cohesion - and monitor the volume of the supply and type of beneficiary	This family tradition may be eroded as result of increase in poverty rates in rural Upper Egypt and higher production costs → weakening of social cohesion
Preparation of KS recipes	Traditional recipes are to be documented as a culinary heritage; new recipes and derivatives ones are to be developed to suit the market and modern consumer preferences	Involvement of the Chef Association of Egypt and tourist industry has been negotiated
Sale of KS for income generation	Initiate campaigns to make known KS; improve quality and safety of home production; apply for and obtain the accreditations and quality labels for KS; work with food industry for production of KS derivatives;	To turn the novelty of the product into as asset exploiting all the potential advantages of KS: its nutritional value, relative low cost, health attributes and the ancient roots to turn it into a popular food for all Egyptians, and not limiting promotional efforts to external markets

Source: AFTER Research

5.3.3 Services and issues

Instead of discussing the services and issues separately, they have been incorporated in the above Table 17 so that they are appreciated in their relation to a given process or the support needed by at that specific phase of the production cycle. The table thus highlights the phases of the production process that warrant attention, as well as indicating the scope and nature for potential improvement.

One of the issues that may need to be looked into is the translation of the collective family and neighbour's inputs into the KS production process into units of cost and time, separating free family/friends' inputs from external paid labour or services. An example of the latter is milling the grains at the village mill or at the neighbour's grain grinder. The table also highlights the critical points in the production process that call for outside help. The effort input – in a number of instances – is already mixed, as hired help is called in when needed. However, when it comes to calculation of production cost or the sale price for the

KS, no precise estimate can really be made. This is virgin ground for KS and costing and price calculation will necessarily need to be considered at a later stage.

Continuity in the production of KS relates in great measure to continuity in the supply of the appropriate raw materials and in the trans-generational transmission of the knowhow. Agricultural policies to protect and preserve local wheat species and to improve veterinary services are needed. With about 80% of the ownership of livestock in the hands of the small farmer, support is needed to look into the finances of an average peasant family and identify ways to help them face the progressive rural poverty and the rising cost of fodder. Rural poverty rates continue to increase following the drastic avian influenza control measures, followed by the progressive increase in the cost of food, fodder and fertilizers. The negative impact of the January 25 revolution on the national economy is not improving matters.

The manner of transmission of traditional "lore" on all that relates to KS needs to be monitored and studied. This is vital for obtaining and retaining the quality label of KS being a food of proven traditional origin. Who retains the knowledge? How is it transmitted? How is the uptake of traditional practices by the new generations? What are the factors enhancing or impeding the transmission of knowledge? How is the traditional process adapting to modernity and what are the modern technology shortcuts that have been integrated into the traditional production, consumption and storage practices? What is the degree of openness of the traditional producers to rationalizing and facilitating the production process, building on the noted initiatives by the producers for adapting to modern materials and instruments as well as to modern consumer preferences? The wealth of information on all the above that has been generated and collected during the AFTER product survey in El Minia, needs to be also documented[2] as it could prove useful in orienting future plans for upgrading the production process to improve the quality and safety of the product. The present Value Chain Analysis (VCA) will prove most useful for identifying the inter-related factors of the causal web that exerts an influence (whether beneficial or negative) on the future evolution of KS production. The non-conclusive outcomes of the past study of the causal factors underlying the progressive interruption in the continuity of production and consumption of the 60 odd regional breads of Egypt could be greatly improved if repeated using the VCA methodology.

5.4 Opportunities, bottlenecks, problems and key success factors

Conclusions as to the problems, bottle-necks and upgrading opportunities, that can be identified from the value chain analysis are incomplete for KS as it is not

[2] The survey report was limited to the items in the common questionnaire that was applied in the study of all the AFTER traditional products.

yet in the market, and continues to be a home based and home consumed product. Only 3.60% of the total annual production reaches the market, and when it does, it is of a quality that is not representative of the original traditional article. The market and consumer response to KS remains to be discovered. Key success factors have to do, essentially, with offering the market a high quality and safe product that is attractive to the consumer and suits his/her preferences. The comparative marketing advantage gained through proven health attributes, the artisanal production process, and proof of its ancient roots all contribute to probabilities for a potentially successful market introduction for KS. The analysis made in the earlier tables attempted to provide details in the VCA that can enable the identification of what needs to be done to ensure safety, quality, and maintain uninterrupted continuity in production outputs. Or, what are the problems that can be foreseen when KS is introduced to the market and modern consumer, here and abroad? And what are the prescriptions that can guarantee success?

The threats and problems will be reviewed and discussed under the SWOT analysis section. The conclusions that can be drawn from the value chain about upgrading/re-engineering opportunities are also discussed under the SWOT analysis and the market mix section.

5.5 SWOT Analysis

Subjecting the KS to a SWOT analysis showed that there is an appreciable potential for the successful outcome of the production and marketing of an improved and safe KS and of its derivatives.

Table 19. SWOT Analysis of Kiskh Sa'eedi

Strengths	**Weaknesses**

• Well established method
• Raw materials available
• Several health attributes
  o High in fibre
  o Pre and probiotic properties
• Long shelf life
• Low cost source of high quality protein
• Large consuming population
• Strong identity
  o Geographical
  o Cultural
  o Historical
  o Physical (balls/nuggets)
• KS sits in a culinary niche
• KS product can be consumed at all stages of its production.
	• Limited to domestic use (not in shops)
	• Geographic limitation of production know-how
	• No standards on product
	• Fermentation depends on wild unidentified starter cultures
	• Wide variation in shape, smell and texture attributes of product
	• Unknown product
	• Inability to satisfy the created market demands

Opportunities	**Threats**
• Export opportunities of product • Possibility for several potentially attractive derivatives • Income generation for women producers of KS • Supply of earthen ware producers with clay from Lake Nasser • Low cost protein from KS satisfies nutrition needs of the poor • Involvement of Egypt's Chef Association in creating novel cuisine recipes for KS • Collaboration with Food Industry for packaging/marketing of KS • Interest of tourist industry for uptake of KS to serve as an entry point for the introduction of Egyptian cuisine • Wild starter culture of KS survives high temperatures	• Food safety in nature (Mycotoxins, brucellosis in the milk) • Limited surplus of production • Infestation with weevils when badly stored • Disappearance of clay for earthen ware containers (high Dam impact) • Inability to manage food safety issues • Absence of IP protection • Food safety rules and regulations of transnational hotel chains do not allow procurement of traditional foods • Shortfalls in raw materials: local; wheat and milk production • Loss of traditional "memory" of production and consumption

Source: AFTER Research

Key assumptions used in the SWOT analysis were as follows:

- KS and its derivatives well received and demand created in global market
- Ability of the consumer to associate KS with its cultural and historic origins
- Gastronomic tourism is created in Egypt around KS and other traditional products

- Traditional preparation methods of KS will never be lost

The conclusions drawn from the SWOT were that this Egyptian traditional product has an appreciable credit of assets operating in its favour. The threats and weaknesses listed above are surmountable and can be contained and managed now that they have been identified.

5.6 Market GAP analysis

Table 20: GAP analysis for Kiskh Sa'eedi and derivatives

Markets	Products			
	Traditional KS balls	**Energy bar**	**Crunchy snack**	**Breakfast Cereal**
Market 1	Supermarkets/ Neighbourhood Food stores	Supermarket/ Neighbourhood Food stores	Supermarket / Neighbourhood Food stores	Supermarket / Neighbourhood Food stores
Market 2		Drug Stores and pharmacies		
Market 3	Hotels, restaurants and catering services, +Airline catering	Outlets selling Egyptian products to tourists	Street kiosks especially outside schools	Hotels, restaurants and catering services
Market 4	Institutional feeding and catering services	Sales outlets at tourist and archaeological sites & airports	Hotels, restaurants and catering services	Institutional / feeding and catering services
Market 5	School feeding programmes and school canteens	Tourist industry outlets selling Egyptian products to tourists	School canteens	
Market 6	Outlets selling Egyptian products to tourist (+airports)		Outlets selling Egyptian products to tourist (+airports+archeo-logical sites)	
Market 7	Tourist industry and visit-and-taste experience from visits to production sites			
Market 8	Niche for artisanal traditional products in Europe, the US, Arab world, and Africa			

Source: AFTER Research

The market space that KS currently occupies is very small as this deep-rooted traditional product is essentially produced to be consumed by family and friends. The analysis given in Table 20, gives the types of potential markets for the

improved KS and its derivatives. The latter include the energy bar, the crunchy snack and the breakfast cereal. Equal attention is accorded to conquering the local market as for creating a niche in the global market for artisanal products. It is believed that the volume of the promising national market has the potential to reach millions of consumers. Competition is expected to be encountered with products of the same category as the derivatives, and less for the mother product. The KS derivatives have the advantage of conforming to the directives promoted by the global programme for prevention and control of non-communicable diseases and obesity (September 2011) that recommends limiting the salt and fat content of foods, and in particular snacks. Combined with a low calorie, high fibre and protein content, the composition of KS derivatives can aspire to a certain percentage of the market. It is recognized that this old food of Egypt is unique. Even those traditional products that carry the same name (Literature Review for KS refers) none share the technology, the composition nor the methods of preparation and consumption. Scores of recipes have been collected by the NRC team since 2004, and the Chefs of Egypt are committed to adapt the old recipes to the modern consumer and to invent new ones inspired by the "nouvelle cuisine".

The marketing strategy vis-à-vis the expatriates and tourists in Egypt is to give them the experience of eating KS and its derived products, incite them to buy it on leaving and thus create a potential consumer abroad who will hopefully create a sustainable demand.

5.7 Summary, conclusions and recommendations

5.7.1 Summary of findings

- KS production remains predominantly a home based production for personal and extended family distribution and consumption, with women as the principle actors.
- The technology and knowhow are transmitted through the women.

The organization of the SSP into an Association of producers can guarantee achievement of the developmental objectives of the AFTER project.

- The production process depends on locally available raw materials; the technology involved is simple and environmentally friendly.
- The geographically limited area of production and consumption of this little known product renders conquering both the national and expatriate markets a challenge.
- The fact that KS has to its credit a number of important assets facilitates the promotion of the product and its consumption.
- Success in obtaining the Euro-Mediterranean food labels and the indication of geographic origin label will serve to both protect and promote the product in a highly competitive market.
- The Food Value Chain (FVC) Analysis has facilitated the task of upgrading and improving on the production, marketing and consumption of KS by identifying the critical areas needing attention.

- The tourist industry is an important stakeholder and AFTER must work closely with them (both state and private) and establish a symbiotic relationship that can be of mutual benefit to the respective interests of both parties.
- The challenge is to coordinate the inputs of the various actors/stakeholders identified in the FVC analysis so as to create synergy and contribute to making progress toward achieving the AFTER project objectives.

5.7.2 Conclusions

Kiskh Sa'eedi is a promising traditional food product of Egypt that has a good chance of success in a strategy aiming at making it known at home and abroad and creating a demand that increases the consumption of both KS and its derivatives. Such a strategy draws on all the actors that have been identified in the FVC analysis, from the housewife in Upper Egypt, to the Chef in a five star hotel, the nations' Airline Company.

5.7.3 Recommendations for upgrading/re-engineering

The recommendations for upgrading concern several domains of KS production, distribution, marketing and consumption. Annex 4 was added so as to serve as a reference list for identification of what needs to be upgraded and what can benefit from re-engineering.

The recommendations include the following (which is not an exhaustive list):

- To guarantee the quality and sustainability in the supply and procurement methods for the raw materials.
- Improvements to the equipment used, in respect of design and to the material they are made of is undertaken in the course of a participatory exercise involving the SSP themselves.
- Identification of the starter culture will make it possible to guarantee respect of the agreed upgraded quality control specifications. However, this does not alter the ownership of the process and the natural resources that enter into the production process of this ancient food, which remains with the Association of KS producers.
- Undertake the appropriate analysis and calculations to come up with an estimate for the real production cost of the product and its derivatives.
- Investigate the regulations that that may stand in the way of access of KS to European market.
- The re-engineering will need to respect the recommendations newly issued to the food industry for avoiding the unhealthy trends commonly encountered in the market for all the three derivatives identified for KS, namely, energy bars, crunchy snacks, and breakfast cereals.
- Due attention is to be given to packaging.
- An accompanying not bearing the cultural and historical background of the product can give a valuable boost to marketing efforts.

Annex 1: Abbreviations and acronyms

AFTER	African Food Tradition Revisited by Research
CFA	Communauté Financière Africaine
DANA	Direction de l'Alimentation et de la Nutrition Appliquée, Benin
DHAB	la Direction de l'Hygiène et de l'Assainissement de Base, Benin
FAO	Food and Agricultural Organisation of the United Nations
FVC	Food Value Chain analysis
GHC	Ghana Cedis
KS	Kiskh Sa'eedi
LE	Egyptian Pound
MOFA	Ministry of Food and Agriculture, Ghana
NRC	National Research Centre, Egypt
NRI	Natural Resources Institute of the University of Greenwich, UK
SME	Small and Medium Enterprise
SWOT	Strengths, Weaknesses, Opportunities and Threats
UEMOA	Union Economique et Monétaire Ouest Africaine
VCA	Value Chain Analysis

Annex 2: List of interviews conducted: Kenkey

Abdulai Mumuni- Farmer- 0206554608
Wudana- Farmer-0248722944
Victoria Sowli- Producer/Vendor- 0244236497
Rebecca Kofi- Producer- 0248218213
Irene Nyaya-Producer- 0243821884
Dzifa- Vendor- 0546058287

Annex 3: List of semi-structured interview questions

Ghana

- What is the cost of one maxi bag of maize at the farm- gate?
- What is the cost of one maxi bag of maize at the Kumasi market?
- What is the cost of one maxi bag of maize in Accra?

Egypt

1. Questions for the producers, processors, vendors, raw material or ingredient providers, and vendors are the Quality Attributes Survey questions and can be found in the cited report (see Annex 4). Interest in forming an Association of KS producers for El Minia small scale producers was also explored all through the survey.
2. The questions for the potential local retail markets, consumers, Chefs, tourist industry, and food industry where formulated to investigate the following:
   -acceptance of sale of the traditional foods (TFs) KS in their chain of stores;
   -what conditions/criteria are deemed important: appearance (colour/shape or form/size/…), safety, quality control, weight of 'unit', packaging, regularity of supply, shelf life duration, or other;
   - what importance is given to lending prominence to traditional origin, nutritional value, health attributes, or other;
   - Interest of the food industry in the establishing production lines for second generation KS derivatives
   - Interest of the Tourist industry in promoting the sale and consumption of KS in its tourist catering services;
   - Interest of the Egyptian Chefs in developing recipes for KS that suit the preferences of the modern consumer
   - Interest of Food and Beverages managers to include TFs in their menus, and under what conditions would they accept that;
   - Interest of the Chamber of Food Industries to include traditional foods and KS in their external trade promotion activities, in particular exposing in international food fairs and exhibits, where Egyptian food is served.

Note:
Information on the potential for production and marketing (local and abroad) was being collected since the initial study by the NRC team initiated in June 2004, which explains that dates for some of the interviewed persons that precede the dates given for the present report. The questions did not change.

Annex 4: Equipment for Kiskh Sa'eedi production

Main utensils, instruments, materials and machines used in KS production:
Milk fermentation:

- Unglazed earthenware *zeer,* goatskin or large plastic container for fermenting the milk;
- fibres from trunk of date palm tree used to scrub clean the *zeer;*
- supply of clean water to wash *zeer*;
- *zeer* stand or support;
- cloth to tie over *zeer*;
- wooden stick to stir the milk;
- container (earthenware/ metal/plastic) to collect the freshly milked milk;
- goatskin, or other container/means for churning the milk;
- container placed under the *zeer* to collect the seeping whey.

Wheat preparation:

- Water to wash the wheat grains;
- Source of heat to boil wheat (open wood fire; gas fire);
- Container to boil wheat (shortened metal barrel , very large metal pot);
- Clean water for boiling;
- Wooden stick to stir the wheat;
- Woven basket (*Qoffa*) or very wide metal colander to drain the water from the parboiled wheat;
- Mats to spread the parboiled wheat to dry in the sun;
- Collect dried grains and coarsely mill in the village mill or by a home grinder;
- Traditional animal gut sieve or modern metal wire mesh sieve to remove fine flour particles from coarsely milled dried parboiled grains.

Wheat-milk fermentation

- large earthenware *"magour*" or another large and wide container that can be made of plastic or other materials in which the fermented milk is mixed into the broken wheat and left to ferment in same container to produce the "*hama"* from a second fermentation;
- blankets or other materials to cover and keep warm the fermenting "*hama";*

Preparation for the shaping and drying of KS balls/nuggets

- Water to lighten the consistency of the *hama;*
- Cumin seeds;
- Ground hot chili peppers (optional);

Sun drying of KS

- Sun exposed flat roof space covered in woven or reed mats

Storage

- Unglazed earthenware pots or tall jars;

- Date palm tree fibres and water to clean the containers;
- Herbs and other fumigants to treat the jar or pot destined for long term storage;
- Fitted round covers for the storage jars;
- Sealing material to render the cover airtight;

Storage space on the roof that is exposed to direct sunlight

Annex 5: List of interviews for Kiskh Sa'eedi

Date	Name	Designation/role	Location/occasion
May-August 2011	Housewives	Small scale producers (SSP) and processors	Quality Attributes (QA) survey
	Shop and street vendors	Retail sale of KS	During QA survey, in Giza and Cairo
	Friends and family of producers	Consumers of KS within and outside the production area	QA survey and personal communications from consumers all over Egypt and abroad
July-August 2011	Dairy producers	Milk production	El Minia
"	Vendors of *laban zeer*	Preparation of fermented *laban zeer* for sale	El Minia
"	Reed collectors and mat makers	Production of reed mats	El Minia
"	Owners of home mills	Milling the parboiled wheat grains	El Minia
July 2011	Shop owners/ street vendors	*"Allaf"* Shop owners and hand cart or side-walk street vendors	Giza,
June-August	Potential modern food markets	Supermarket owners	Cairo, Alexandria and Giza
March 2010	Mr. Mohamed Shoukri	Food processing factory owner	Cairo
January 2010	Hashem Abdel Kader	Head, Food Sector Technical Assistance. Industry Modernization Center(IMC)	Cairo
May 2010 to August-September 2011	Ms. Mirjam van Ijssel, Executive Director Ms. Samira Mahmoud ECA Public Relations Officer Mr. Ashraf Mahdi, Executive Sous Chef, Marriott Hotel, Zamalek	Egyptian Chefs Association (ECA)	Cairo (ECA represents Chefs from all Governorates and restaurants in Egypt) (see Regulatory survey)

May 2010	Mr. Luciano Scelza	Director, Food and Beverages (F&B), Marriot Hotel, Cairo	Cairo
December 2010	Mr. Farid Guirguis	General Manager, Mercure Le Sphinx Hotel, former F&B at The Old Cataract Hotel in Aswan	Giza
May 2011	Mr. Adel Omar CTE President	Chamber of Tourism Establishments (CTE)	Cairo
June 2011	Mr. Ahmed Mahmoud Attia First Under-*Sec*retary	Ministry of Tourism, Hotels and Tourist Villages Sector	Cairo, Partner in the programme for valorisation of TF of Egypt since Oct2010
May 2010	Mr Samy Mahmoud, Undersecretary	Egyptian Tourist Authority, The International Tourism Sector	Cairo, Presentation of KS at Conference on Traditional Foods
June 2011	Prof. Mahmoud M. Hewedi	Faculty of Tourism and Hotelrie, Fayyum University, Fayyum	
2010- to present time (NRC AFTER partner is on the EOS TF Technical Advisory Committee)	Eng. Azza Mostafa , Director General for Standards	Egyptian Organization of Standards and Quality (EOS) (Programme for standard setting of foods of traditional origin (TFs))	Cairo
June-July 2011	Mr Yousri Tinawy, General Manager	Chamber of Food Industries (CFI)	Cairo

TF = Traditional Foods

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