

Market analysis

Analysis of the current market situation and future market perspectives of maize and cassava cultivated by farmers in the Western Region, Ghana.



Institute for Sustainable Commodities

Appendix

June 2007

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MSc Thesis

Student:

Email:

Registration number:

Study:

MCB-80436

Femke van der Geer

femke.vandergeer@wur.nl

820820-252-070

Management Economics and Consumer Studies

Commissioner:

Accompaniment:

Email:

ISCOM

Dr. T. Wolters

twolters@iscom.nl

University:

Chair group:

Graduate advisors:

Email:

Wageningen University and Research Centre

Marketing and Consumer Behaviour

Dr. A. van Tilburg

aad.vantilburg@wur.nl

Dr. Y. van Dam

ynte.vandam@wur.nl

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Appendix 1. Background information

§ 1.1 Ghana

Ghana is a small West African country. Paragraph § 1.1.1 discussed the geography of the country and § 1.1.2 will discuss the tropical climate of Ghana.

§ 1.1.1 Geography

The Republic of Ghana (formerly the Gold Coast) lies on the Gulf of Guinea on the western coast of tropical Africa only a few degrees north of the Equator. Ghana extends for a maximum of 672 km from north to south and for 536 km east to west. It is bordered to the west by Côte d'Ivoire, to the north by Burkina Faso, to the east by Togo and to the south by the Atlantic Ocean. Ghana is not a large country by African standards; it has a total land area of 238,537 km² (Briggs, 2004).

Ghana is divided into ten administrative regions; Greater Accra, Eastern, Western, Central, Volta, Brong Ahafo, Ashanti, Northern, Upper East & Upper West. English is the official national language, and it is widely spoken as a result of the country's long links with Britain and an unusual high standard of education from colonial times to the present day. A total of at least 75 African languages and dialects are spoken in Ghana (Briggs, 2004).



Figure 1.1 Regions Ghana (wikipedia, 2006)

Half of the country lies less than 152 meters (500 ft.) above sea level, and the highest point is 883 meters (2,900 ft.). The 537-kilometer (334-mi.) coastline is mostly a low, sandy shore backed by plains and scrub and intersected by several rivers and streams, most of which are navigable only by canoe. A tropical rain forest belt, broken by heavily forested hills and many streams and rivers, extends northward from the shore, near the Cote d'Ivoire frontier. This area, known as the "Ashanti," produces most of the country's cocoa, minerals, and timber. North of this belt, the country varies from 91 to 396 meters (300-1,300 ft.) above sea level and is covered by low bush, parklike savanna, and grassy plains (www.ghana.com).

§ 1.1.2 The climate

The climate is tropical. The eastern coastal belt is warm and comparatively dry; the southwest corner, hot and humid; and the north, hot and dry. There are two distinct rainy seasons in the south-May-June and August-September; in the north, the rainy seasons tend to merge. A dry, northeasterly wind, the Harmattan, blows in January and February. Annual rainfall in the coastal zone averages 83 centimeters (33 inch.) (Briggs, 2004).

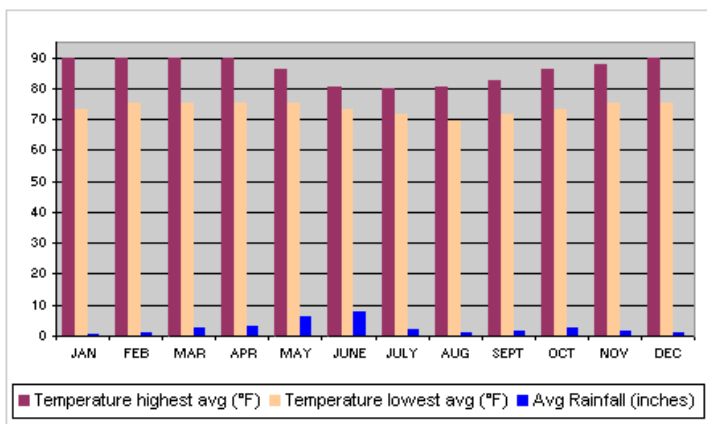


Figure 1.2 The climate (www.ghanaweb.com)

§ 1.2 Maize

Maize is a cereal grain that was domesticated in Mesoamerica. In the United States, Canada and Australia it is called corn, but in other countries that term may refer to other cereal grains. Maize is one of the first crops for which genetically modified varieties make up a significant proportion of the total harvest.



Figure 1.3 Cultivars of Maize

Table 1.1 Scientific classification of maize

Kingdom:	plantae
Division:	Magnoliophyta
Class:	Liliopsida
Order:	Poales
Family:	Poaceae
Genus:	Zea

While some maize varieties grow 7 m (23 ft) tall, commercial maize has been bred for a high-end height of 2,5 m (9 ft). Sweet corn is usually shorter than field corn varieties ([wikipedia, 2006](#)).

§ 1.2.1 Maize physiology

The stems look like bamboo cane and the joints (nodes) are about 40 till 50 cm (16-20 in) apart. Maize has a very distinct growth form, the lower leaves being like broad flags, 50–100 cm long and 5–10 cm wide (2–4 ft by 2–4 in); the stems are erect, from 2–3 m (7–10 ft) in height, with many nodes, casting off flag-leaves at every node. Under these leaves and close to the stem grow the ears.

The ears are female inflorescences, tightly covered over by several layers of leaves, and so closed in by them to the stem, that they do not show themselves easily until the emergence of the pale yellow silks from the leaf whorl at the end of the ear. The silks are elongated stigmas that look like tufts of hair, at first green and later red or yellow. Maize planted individually will develop 2–4 ears. Modern farming techniques in developed countries usually rely on dense planting, which reduce the number of ears per stalk to about 0.9 (that is, an average of one per plant with some so stressed they produce zero mature ears.) Plantings for silage will be even denser to achieve an even lower percentage of ears and more plant matter. Certain varieties of maize have been bred to produce additional developed ears, and these are the source of the "baby corn" that is used as a vegetable in Oriental cooking.

Maize cultivars grown in the temperate zone are day neutral and flower after a certain number of days at $> 50^{\circ}\text{F}$ (10°C). However, maize cultivars from tropical locations typically have a short day requirement for flowering and will not produce ears and tassels in the long summer days at higher latitudes. The day length requirement for flowering is genetically controlled.

The apex of the stem ends in the tassel, an inflorescence of male flowers. For each silk on which pollen from the tassel lands, one kernel of corn is produced. Young ears can be consumed raw, cob, silk, and all; as the plant matures (usually during the summer months) the cob becomes tougher and the silk dries to inedibility. By late August the kernels have dried out and become difficult to chew without cooking them tender first in boiling water.

The kernel of corn has a pericarp of the fruit fused with the seed coat, typical of the grasses. It is close to a multiple fruit in structure, except that the individual fruits (the kernels) never fuse into a single mass. The grains are about the size of peas, and adhere in regular rows round a white pithy substance, which forms the ear. An ear contains from two to four hundred grains, and is from 10–25 cm (4–10 inches) in length. They are of various colours, blackish, red, white and yellow. When ground into flour, it yields more flour, with much less bran, than wheat does.

A genetic variation that accumulates more sugar and less starch in the ear is consumed as a vegetable and is called sweet corn ([wikipedia, 2006](#)).

§ 1.2.2 Pollination

Maize is a monoecious species, with male flower (tassel) located at the top of the stem and female flowers (ears) located about midway down on the same plant. This spatial arrangement of the flowers facilitates both selfing (pollination of the female flower with pollen from the same plant) and crossing (pollination of the female flower with pollen from a different plant). Reproduction in maize is initiated when pollen shed from tassel fertilizes ovules located in the ear. Each tassel on a mature maize plant can produce up to 10 million male gametes (pollen grains). These pollen grains are enclosed in anthers, which open a few days before the silks (stigmas) emerge on the ears. Within minutes of landing on a silk, a pollen grain germinates, sending a pollen tube down along the stigma to the ovary, where fertilization is completed within 24 hours. A single ear can produce up to 1,000 female gametes (ovules), with each gamete eventually producing a viable seed. Although a maize plant may be shedding pollen when its silks emerge, normally more than 97% of the seeds produced by any given plant result from pollination with pollen from other plants (Aldrich, Scott, and Leng 1975). The ability to open-pollinate distinguishes maize from other leading cereals such as wheat and rice, which are self-pollinating. When self-pollinating crops reproduce, the pollen used to fertilize a given ovary almost always comes from the same plant, with the result that each generation of plants retains the essential genetic and physiological identity of the preceding generation. By contrast, when maize reproduces, genetic material is exchanged between neighbouring plants, with the result that unless pollination is carefully controlled, all of the maize plants in a given field will tend to differ from the preceding generation and from each other ([Morris, 2002](#)).



Figure 1.4
Maize plants showing ears



Figure 1.5
Maize female flower



Figure 1.6
Maize male flower

§ 1.2.3 Cultivation

Maize is widely cultivated throughout the world, and a greater weight of maize is produced each year than any other grain. While the United States produces almost half of the world's harvest, other top producing countries are as widespread as China, Brazil, France, Indonesia, and South Africa.

Table 1.2 UN Food & Agriculture Organisation (FAO, 2005)

Top Ten Maize Producers - 2005 (million metric ton)	
 United States	280
 China	131
 Brazil	35
 Mexico	21
 Argentina	20
 Indonesia	15
 France	13
 India	12
 South Africa	12
 Italy	11
World Total	692

Maize is planted in the spring to take advantage of spring rains. Its root system is generally shallow, so the plant is dependent on soil moisture. As a C4 plant (a plant that uses C4 photosynthesis), maize is a considerably more water-efficient crop than a C3 plant, like the small grains, alfalfa and soybeans. Maize is most sensitive to drought at

the time of silk emergence, when the flowers are ready for pollination. Maize used as silage is harvested while the plant is green and the fruit unmaturing. Sweet corn is harvested between late summer and early to mid-autumn. Field corn is left in the field very late in the autumn in order to dry thoroughly, and may, in fact, sometimes not be harvested until winter or even early spring. The importance of regular rain is shown in many parts of Africa, where periodic drought regularly causes famine by causing maize crop failure ([wikipedia, 2006](#)).

§ 1.2.4 Maize diseases

Diseases caused by fungi: Foliar diseases

Diseases caused by fungi: Stalk rots and smuts

Diseases caused by fungi: Ear rots

Diseases caused by bacteria

Diseases caused by viruses and mollicutes ([CIMMYT, 2004](#)).

§ 1.2.5 Multiple end uses

No other cereal can be used in as many ways as maize. Virtually every part of the maize plant has economic value. The grain can be consumed as human food, fermented to produce a wide range of foods and beverages, fed to livestock, and used as an industrial input in the production of starch, oil, sugar, protein, cellulose, and ethyl alcohol. The leaves, stalks, and tassels can be fed to livestock, either green (in the form of fodder or silage) or dried (in the form of stover). Even the roots can be used for mulching, incorporated into the soil to improve the physical structure, or dried and burned as fuel. In view of the multiple end uses, it is not surprising that the maize varieties being grown today include literally thousands of distinct cultivars with different combinations of consumption traits (ear size and shape; grain size, shape, color, texture, smell, and taste; grain processing, storage, and cooking quality; endosperm oil or starch content; husk quality). Although maize is not the only crop to feature a lot of genetic diversity, what distinguishes maize from most other crops is the extent to which genetic diversity is actively managed at the household level. In most developing countries where maize is an important crop, it is not uncommon to find the same household growing three, four, and sometimes even more distinct maize varieties, each carefully selected to satisfy a specific food, feed, or industrial use ([Morris, 2002](#)).

§ 1.3 Cassava

Cassava is a woody shrub of the Euphorbiaceae that is extensively cultivated as an annual crop in tropical and subtropical regions for its edible starchy tuberous root, a major source of carbohydrate.



Figure 1.7 Unprocessed cassava root

Table 1.3 Scientific classification of cassava

Kingdom:	plantae
Division:	Magnoliophyta
Class:	Magnoliopsida
Order:	Magpighiales
Family:	Euphorbiaceae
Genus:	manhiot

The root is long and tapered, with a firm homogeneous flesh encased in a detachable rind, about 1 mm thick, rough and brown on the outside. Commercial varieties can be 5 to 10 cm in diameter at the top, and 50 to 80 cm long. A woody cordon runs along the root's axis. The flesh can be chalk-white or yellowish; it breaks like a carrot's, and darkens quickly upon exposure to the air. For this reason, the skinned root must be kept under water until it is ready to be cooked. The root's flavour spoils in a day or so, even if kept unskinned and under refrigeration, which is a problem for supermarkets. A solution is usually to freeze it or seal it in wax ([wikipedia, 2006](#)).

§ 1.3.1 Uses

The cassava plant gives the highest yield of food energy per cultivated area per day among crop plants, except possibly for sugarcane. Cassava roots are very rich in starch, and contain significant amounts of calcium (50 mg/100g), phosphorous (40 mg/100g) and vitamin C (25 mg/100g). However, they are poor in protein and other nutrients. In contrast, cassava leaves are a good source of protein if supplemented with the amino acid methionine ([wikipedia, 2006](#)).

Roots are prepared much like potato. They can be peeled and boiled, baked, or fried. It is not recommended to eat cassava uncooked, because of potentially toxic concentrations of cyanogenic glucosides that are reduced to innocuous levels through cooking.

In traditional settings of the Americas, roots are grated and the sap is extracted through squeezing or pressing. The cassava is then further dried over a fire to make a meal or fermented and cooked. The meal can then be rehydrated with water or added to soups or stews. In Africa, roots are processed in several different ways. They may be first fermented in water. Then they are either sun-dried for storage or grated and made into dough that is cooked. Alcoholic beverages can be made from the roots.

Young tender leaves can be used as a potherb, containing high levels of protein (8-10% F.W.). Prepared in a similar manner as spinach, care should be taken to eliminate toxic compounds during the cooking process. One clone with variegated leaves is planted as an ornamental ([Stephen K. O'Hair, 1995](#)).

Africa

In the humid and sub-humid areas of tropical Africa, cassava is either a primary staple food or a secondary co-staple. In West Africa, cassava is commonly prepared as Eba or Garri. The cassava is grated, pressed, fermented and fried then mixed with boiling water to form a thick paste. In Ghana the cassava root is pounded, mixed with boiling water to form a thick paste and cooked as Fufu. People economically forced to depend on cassava risk chronic poisoning diseases, such as tropical ataxic neuropathy (TAN), or such malnutrition diseases as kwashiorkor and endemic goitre.

In Central Africa, cassava roots are traditionally processed by boiling and mashing. The resulting mush can be mixed with spices then cooked further or stored. A popular snack is made by marinating cassava in salted water for a few days then grilling it in small portions. Many cassava dishes exist in various African countries ([wikipedia, 2006](#)).

Animal feed

Cassava is used as animal feed in Latin America and the Caribbean, China, Nigeria and the European Union ([wikipedia, 2006](#)).

§ 1.3.2 Crop Culture

Ecology

Cassava is a tropical root crop, requiring at least 8 months of warm weather to produce a crop. It is traditionally grown in a savanna climate, but can be grown in extremes of rainfall. In moist areas it does not tolerate flooding. In drouthy areas it looses its leaves to conserve moisture, producing new leaves when rains resume. It takes 18 or more months to produce a crop under adverse conditions such as cool or dry weather. Cassava does not tolerate freezing conditions. It tolerates a wide range of soil pH 4.0 to 8.0 and is most productive in full sun ([Stephen K. O'Hair, 1995](#)).

Cultivars

Before the development of national and international breeding programs with cassava there were relatively few cultivars. This is because cassava is propagated vegetatively as clones. Recent releases from breeding programs include clones with resistance to many of the major diseases and pests. Specific cultivar names are mostly regional, with the exception of introductions from international research centers, which carry with them an institutional code. This code is often retained as the name of the cultivar. Cultivar classification is usually based on pigmentation and shape of the leaves, stems and roots. Cultivars most commonly vary in yield, root diameter and length, disease and pest resistance levels, time to harvest, cooking quality, and temperature adaptation. Some clones require 18 or months of growth before they can be harvested. Storage root color is usually white. A few clones have yellow-fleshed roots ([Stephen K. O'Hair, 1995](#)).

Production Practices

Cassava is planted using 7-30 cm portions of the mature stem as propagules. The selection of healthy, disease-free and pest-free propagules is essential. The stem cuttings are sometimes referred to as 'stakes'. In areas where freezing temperatures are possible, the cuttings are planted as soon as danger of frost has past. The cuttings are planted by hand in moist, prepared soil, burying the lower half. When soils are too shallow to plant the cutting in an upright or slanted position, the cutting are laid flat and covered with 2-3 cm soil. Mechanical planters have been developed in Brazil to reduce labor inputs. Observing the polarity of the cutting is essential in successful establishment of the cutting. The top of the cutting must be placed up. Typical plant spacing is 1m by 1m. Cuttings produce roots within a few days and new shoots soon appear at old leaf petiole axes on the stem. Botanical seeds are used only for breeding purposes. Early growth is relatively slow, thus weeds must be controlled during the first few months. Although cassava can produce a crop with minimal inputs, optimal yields are recorded from fields with average soil fertility levels for food crop production and regular moisture availability. Optimal growth and productivity of the plant is related to its harvest index, root weight divided by total plant weight. The desirable indexes range from 0.5 to 0.7. Responses to macro-nutrients vary, with cassava responding most to P and K fertilization. Vesicular-arbuscular (VA) mycorrhizae benefit cassava by scavenging for phosphorus and supplying it to the roots. High N fertilization, more than 100 kg of actual N/ha may result in excessive foliage production at the expense of storage root development and a low harvest index. Fertilizer is only applied during the first few months of growth. Commercially produced fungicides and pesticides are seldom used. There is no mature stage for cassava. Plants are ready for harvest as soon as there are storage roots large enough to meet the requirements of the consumer. Under the most favorable conditions, yields of fresh roots can reach 90 t/ha while average world yields from mostly subsistence agricultural systems are 9.8 t/ha. Typically harvesting can begin as soon as eight months after planting. In the tropics, plants can remain unharvested for more than one growing season, allowing the storage roots to enlarge further. However, as the roots age, the central portion becomes woody and inedible ([Stephen K. O'Hair, 1995](#)).

Harvesting

Most cassava is harvested by hand, lifting the lower part of stem and pulling the roots out of the ground, then removing them from the base of the plant by hand. The upper parts of the stems with the leaves are removed before harvest. Levers and ropes can be used to assist harvesting. A mechanical harvester has been developed in Brazil. It grabs onto the stem and lifts the roots from the ground. Care must be taken during the harvesting process to minimize damage to the roots, as this greatly reduces shelf life. During the harvesting process, the cuttings for the next crop are selected. These must be kept in a protected location to prevent desiccation ([Stephen K. O'Hair, 1995](#)).

Processing

The shelf life of cassava is only a few days unless the roots receive special treatment.

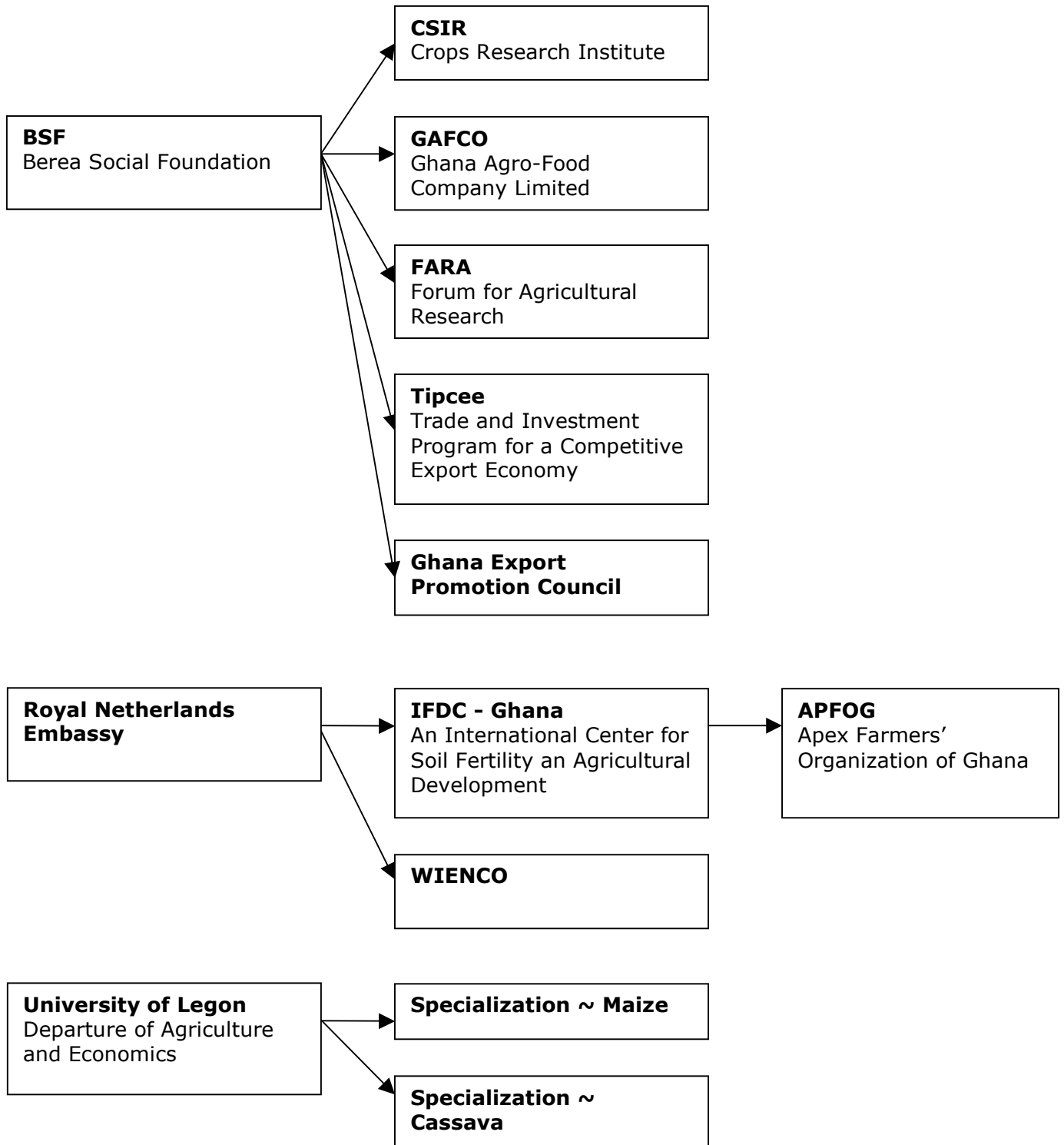
- Removing the leaves two weeks before harvest lengthens the shelf life to two weeks. Dipping the roots in paraffin or a wax or storing them in plastic bags reduces the incidence of vascular streaking and extends the shelf life to three or four weeks. Roots can be peeled and frozen. Traditional methods include packing the roots in moist mulch to extend shelf life.
- Dried roots can be milled into flour. Maize may be added during the milling process to add protein to the flour. The flour can be use for baking breads. Typically, cassava flour may be used as partial substitute for wheat flour in making bread. Bread made wholly from cassava has been marketed in the U.S.A. to meet the needs of people with allergies to wheat flour.
- Fresh roots can be sliced thinly and deep fried to make a product similar to potato chips. They can be cut into larger spear-like pieces and processed into a product similar to french fires.
 - Roots can be peeled, grated and washed with water to extract the starch which can be used to make breads, crackers, pasta and pearls of tapioca.
 - Unpeeled roots can be grated and dried for use as animal feed. The leaves can add protein to animal feed.
- Industrial uses where cassava is used in the processing procedures or manufacture of products include paper-making, textiles, adhesives, high fructose syrup and alcohol ([Stephen K. O'Hair, 1995](#)).

Table 1.4 Cassava products for human consumption, Livestock Feed and Industrial use

Major uses cassava		
<i>Human consumption</i>	<i>Livestock feed</i>	<i>Industrial use</i>
Raw cassava	Cassava pellets	Starch
Boiled cassava	Cassava meal	Alcohol
Cooked cassava slices	Cassava chips	Glucose
Fried cassava slices	Cassava slices	Acetone
Cassava flakes	(fresh or boiled)	Dextrins
Fermented cassava	Cassava peels	Glues and pastes
Cassava flour	Cassava-leaf meal	Binders
Macaroni	Broken roots	Stabilizer
Fufu	Cassava silage	Bodying agent (caramel)
Gaplek		Fillers
Composite flour, bread		Dusting agent
Tapioca		(chewing gum)
Gari		Single-cell protein
Cassaripo or tucupa		
Cassava rice		

([Bede N. Okigbo, 1980](#))

Appendix 2. Interview framework



- **APFOG**

F530/4 Ring Road east, OSu
P M B CT 284 Cantonments
Accra Ghana
apfogsecretariat@yahoo.com

Gabriel Mills *Programme Officer*
Gabbymills@yahoo.com
Tel: 021787051
Mobile: 0243526021

(CropLife Ghana)
croplifeghana@yahoo.com
Fredrick B. Boampong *Programme officer*
fredeminkab@yahoo.com
Mobile: 0244273075

(GAABIC ~ Ghana Agricultural Associations Business & Information Centre)
Juliet Biney *Executive Secretary*
jbiney@hotmail.com
Mobile: 0244743070

- **BSF Berea Social Foundation**

BSF@iscom.nl
P.O. Box MC 1274 Takoradi
Tel: 03131522

Benjamin Epton *Director*
eptonben@yahoo.com
Mobile: 0243507986

Mercy Enchill Duodu *Assistent Project Officer*
medy87@yahoo.com
Mobile: 0244175891

- **CSIR Crops Research Institute**

P.O.Box 3785
Kumasi Ghana
Tel: 05160389

E. Moses (cassava)
e.moses@cropsresearch.org

Joyce Haleegoah (Maize)
jhaleegoah@cropsresearch.org

- **Fara Forum for Agricultural Research in Africa**
www.fara-africa.org
2 Gowa Close, Roman Ridge
PMB CT 173 Accra
Tel: 021772823

Sidi Sanyang *Scientific Research Person*
ssanyang@fara-africa.org
Mobile: 0243588230
- **GAFCO Ghana agro-food company limited**
P.O. Box 11345 Tema
Tel: 022216469

Klaus Kuebler *Tech & Agro products Manager*
Klaus.kubler@gafco.com.gh
Mobile: 0244312484

Samuel Seddoh Jr. *Agro Sales Coordinator*
novisbay@yahoo.com
Mobile: 0244312950
- **Ghana Export Promotion Council**
Kumasi
Adjeiyeboah2003@yahoo.com
Tel: 021228813
- **IFDC**
An International Centre for Soil Fertility and Agricultural Development
P.O.Box 1630
3, Orphan Crescent, Labone - Accra
www.ifdc.org
Tel: 021780830
Fax: 021780829

Manon Dohmen *Economist/ Association Specialist*
mdohmen@ifdc.org
www.mistowa.org
Mobile: 024422166
- **Royal Netherlands Embassy**
Consular Section
89 Liberation Road
P.O. Box CT 1647, Accra, Ghana
Tel: +233 21 785 497
Fax: +233 21 782 557

Wilma van Esch *First Secretary/Dev. Cooperation/Environment*
Wilma-van.esch@minbura.nl

- **Tipcee**
Trade and Investment Program for a Competitive Export Economy
Codemm House
1st Dzorwulu Crescent, West airport
PMB CT 330, Accra, Ghana
Tel: 021775350
Fax: 021775293

Takyi Sraha *Business Specialist*
tsraha@tipcee Ghana.org
Mobile: 0244232771
- **University of Legon**
Professor Foso
P.O. Box 25 Legon

Dr. Akwasi Mensah – Bonsu (Cassava)
ambonsu@ug.edu.gh
amensahbonsu@yahoo.com

Dr. Irene Gyir
ireneegyir@yahoo.com
- **WIENCO**
Marc Kok
m.kok@wienco.com
Mobile: 0244292888

Appendix 3. Introduction researcher and objective



Femke van der Geer

23 years old

Postgraduate student at Wageningen University

Specialisation of study: Management, economics and consumer behaviour

Ghana: research for ISCOM

ISCOM organizes small farmers in Western Region within the framework of the SUSCAP program, which is sponsored by the Dutch government (TMF). This program is about sustainable chain management and poverty reduction. One of groups involved is a cooperative in the Tarkwa area. Pineapple is scheduled to be processed. However, also maize and cassava are being considered as main crops to be produced on a large scale. For that matter, it is important to know what the market developments are, both on the medium and long term. This is what I am going to find out.

I, Femke van der Geer, will go to Ghana on 23rd May for four weeks to conduct interviews for ISCOM with various persons. These interviews are helpful in getting to know what the view of different parties is on the future market for maize and cassava in Ghana. In this, developments in the world market are likely to be important, as are regional developments, such as growth of the national processing industry. These interviews fit also very well in my Msc thesis work at Wageningen University.

I wish to thank you very much in advance for your kind cooperation.

For more information about ISCOM and its projects, please visit ISCOM's website: www.iscom.nl.

Kind regards,

Femke van der Geer

Femke.vandergeer@wur.nl

Phone 024 6319585

Appendix 4. Semi-structured interview

Introduction

My name is Femke van der Geer and I'm 23 years old. I'm a post graduate student at Wageningen University. My specialisation of study is Management, economics and consumer behaviour. ISCOM is the company who offered me this opportunity to visit Ghana to learn more about the market for sustainable commodities.

First I would like to give you a short introduction about ISCOM and its projects.

ISCOM organizes small farmers in the Western Region within the framework of the SUSCAP program, which is sponsored by the Dutch government (TMF). This program is about sustainable chain management and poverty reduction. One of groups involved is a cooperative in the Tarkwa area. Pineapple is scheduled to be processed. However, also maize and cassava are being considered as main crops to be produced on a large scale. For that matter, it is important to know what the market developments are, both on the medium and long term.

So, I want to learn more about the market developments of maize and cassava. I hope that this meeting can help me and ISCOM with answering the research problem.

I hope you will introduce yourself as well.

- Name
- Company/ Companies activities
- Function/ task
- Number of employees/ Annual turnover of the company

Category 1. Usage of the products

First, need to be looked whether the maize and cassava are consumed or sold at the market?

- 1.1 What is the priority of the farmers? – Consuming or selling of their products?
- 1.2 Which quantity of the products will be consumed? – Why?
- 1.3 Which quantity of the products will be sold? - Why? – How?

Category 2. Location

The second step is to become aware of the features of home consumption and where the products will be sold.

- 2.1 What are the features of home consumption?
- 2.2 Where are the products sold?
 - At the local market?
 - At the regional market in "West Africa"?
 - At the world market?
- 2.3 Can you describe those markets (local, regional and/or world) of maize (and cassava)
- 2.4 What are the most important differences between the markets for maize (and cassava)?

- Varieties	- Uses
- Quality	- Processing
- Price	- Transport
- Resources	- Supply chain
- 2.5 Why are the products sold or not sold at the different markets?

Category 3. Expectations

Finally, the perspectives and changes of the product offer will be searched for the mid term and long term. So, what are the market perspectives for maize and cassava cultivated by farmers of the Western Region in the mid term and long term?

- 3.1 Will there be a shift between consumption and sales of the products in the future? – In the next 3 till 5 years? – In the next 5 till 10 years?
 - 3.2 What are important changes which contribute to a shift from consumption to sales of the products?
 - 3.3 What do you expect of the local market of maize (of cassava) in the next 3 till 5 years? - In the next 5 till 10 years?
 - 3.4 What do you expect of the regional market (West Africa) of maize (of cassava) in the next 3 till 5 years? - In the next 5 till 10 years?
 - 3.5 What do you expect of the World market of maize (of cassava) in the next 3 till 5 years? - In the next 5 till 10 years?
 - 3.6 Which factors contribute to a shift within the three markets; local, regional, world market?
 - 3.7 Is it possible to influence these factors? – And in which way?
- What are positive aspects? (Strengths, opportunities and chances)
 - What are negative aspects? (Weaknesses, threats and difficulties)

Appendix 5. Planning primary research Ghana

The subsequent table will present the planning of the research in Ghana. At some of the activities the name of Evelien is mentioned; these are research activities of the other student; Evelien van Doorn, which is also and researcher of the company ISCOM.

Date	Day	Activity
23-05-06	Tuesday	Travel ~ departure 13.05 hour Amsterdam and arrival 21.05 hour Accra
24-05-06	Wednesday	Getting acquainted with the country, climate and BSF / Synchronize planning with BSF
25-05-06	Thursday	GAFCO Seminar Winneba ~ Making an appointment with Mr. Kuebler Making a report of the Seminar
26-05-06	Friday	(Evelien) Blue Skies ~ visit Pineapple farm in Nsawam
27-05-06	Saturday	(Evelien) Farmers in Nsawam (Evelien) Company Pharmapine
28-05-06	Sunday	-----
29-05-06	Monday	(Evelien) Technoserve Interview Marc Kok of Wienco /Making an appointment at the University of Legon
30-05-06	Tuesday	Interview and visit Mr. Kuebler of GAFCO Interview at the University of Legon
31-05-06	Wednesday	Interview Manon Dohmen of IFDC
01-06-06	Thursday	Making an appointment with Export Promotion Counsel Departure Accra -> Kumasi
02-06-06	Friday	Interview Crops Research Centre Interview Export Promotion Council
03-06-06	Saturday	Making some reports of the interviews
04-06-06	Sunday	-----
05-06-06	Monday	Driving from Kumasi to Takoradi
06-06-06	Tuesday	Interview BSF
07-06-06	Wednesday	Visit and interview farmers in Tarkwa
08-06-06	Thursday	Making a travel report and a report of the expenses for ISCOM and BSF
09-06-06	Friday	Making some reports of the interviews
10-06-06	Saturday	-----
11-06-06	Sunday	-----
12-06-06	Monday	Making some reports of the interviews
13-06-06	Tuesday	Making some reports of the interviews
14-06-06	Wednesday	Cape Coast
15-06-06	Thursday	Driving from Takoradi to Accra
16-06-06	Friday	Interview FARA Interview Dutch Embassy in Ghana
17-06-06	Saturday	Making some reports of the interviews
18-06-06	Sunday	-----
19-06-06	Monday	Pack and departure at 20.00 hour to airport
20-06-06	Tuesday	Travel ~ departure 00.10 hour Accra and arrival 12.05 hour Amsterdam

Appendix 6. Report of activities in Ghana (BSF)

23rd May 2006:

- 11:00am left for Accra
- 21:00pm at the airport
- 22:10pm Femke and Evelien arrived
- 23:00pm at the Tops hotel in Accra

24th May 2006:

- Changing money at a forex bureau
- Submitted the letter to the National Service Secretariat and met with Agro-Eco
- Made a planning for the whole week

25th May 2006:

- 7:00am left for Winneba
- 10:30am at the seminar with people from GAFCO and MOFA

We met with Klaus Kuebler from GAFCO at the seminar. After the seminar we made an appointment for Tuesday 30/05 at 9:00am to visit GAFCO in Tema. We also asked the MOFA District Officer if he knew where to find the Awutu-Effutu-Senya pineapple growers cooperative. He was able to facilitate a name and telephone number. We called them but the chairman was not available and we should call back on Sunday. After that we went back to Accra.

- Called Anthony Pile and made appointment with Blue Skies for the next day at 7:00 a.m
- Called Adonten pineapple growers and marketing society and made appointment with farmers in Nsawam for Saturday at 9:00am

26th May 2006:

- Left for Blue Skies at 5:30am
- Meeting with Anthony Pile at 6:45am at Blue Skies
- Mercy was ill

Left with Anthony Pile for the BSOC Pineapple Farmers Association in Ekumfi Abor at 7:00 a.m. We had an interview with him in the car on the way to the farmers. We arrived around 10:00 a.m. We did the formalities with the farmers and visited the pineapple packing station nearby and a new built well. After we came back the most important farmers were there and the meeting started. It was a hard conversation with the farmers, because the price they get for their pineapples will decrease. The farmers were angry and Anthony was trying to make a deal with them. Eventually it worked and the meeting was over at 14:00pm. We went back to Accra.

- Made appointment with Techno serve on Monday

27th May 2006:

- 8:00am left for Nsawam to the Adonten Pineapple growers and marketing society for interview
- Interview with Farmapine Cooperatives
- Interview with Sam-Sam pineapple growers and marketing society at Odumase

In the morning we visited the farmers near Nsawam and after this visit we got a whole lot of pineapples, papayas and coconuts from them. On our way back we visited Farmapine Ghana Limited a production services and export marketing of fresh pineapples company. We were fortunate to meet the Export/Quality Assurance Manager because it was a Saturday and normally they do not work on Saturdays but he was willing to speak to us. We had an interview with him and got the address of other farmers connected with Farmapine from him. We went to these farmers and had a short interview with the chairman, because he had a funeral. At 16:00pm we went back to Accra.

28th May 2006:

- Went to church

In the afternoon called Marc Kok from Wienco to confirm the appointment for that afternoon. He was busy and could not make it. We made an appointment for Monday at 15:00pm.

29th May 2006:

- 8:00am interview with Technoserve
- Visited FARA for appointment
- Visited the University of Ghana for Professor Fosu
- Interview Marc Kok from Wienco

In the morning we had an interview with an expert on cooperative development from Technoserve. After that we visited FARA to make an appointment or have an interview with an expert on the market perspectives of maize and cassava. The man did not have time and said we should call him on the 14th of June for making an appointment then. After that we drove to the University of Ghana to search for Professor Fosu. He was not available, because he was in Kumasi, but we were able to make an appointment with Dr. Akwasi Mensa for Tuesday 30/05 at 14:00pm. At 15:00 we went to Wienco and had an interview with Marc Kok about the market perspectives on maize and cassava.

30th May 2006:

- 7.00am had a meeting with HEII
- 8.30am visited Ghana Export Promotion Council met with Mr. Obeng
- 10:00am interview with Klaus Keubler and Samuel Seddoh Jnr.
- 14:00pm interview with two experts from the University of Ghana

In the morning we went to Tema for an interview with Klaus Keubler, but he was not in. We met with Samuel Seddoh Jnr and Klaus Keubler later joined in the interview.

31st May 2006:

- 8:00am meeting with Manon Dohmen, she gave a lot of addresses about people who could give us information about the market perspectives of maize and cassava
- Afternoon visited the Power pineapple growers cooperative in Dodowa

1st June 2006:

- In the morning we went to the Ghana Export Promotion Council, but they were not in
- Traveled to Kumasi
- Called and E-mailed Kuapa Kokoo for an appointment

2nd June 2006:

- 10:00am interview with two experts from Crop Research Institute on maize and cassava market
- 15:00pm interview with Adjei Yeboah of the Ghana export promotion council in Kumasi

3rd and 4th June 2006:

- No meetings, just a free weekend

5th June 2006:

- Called Kuapa Kokoo for appointment, but they didn't have time
- Bought books for the church
- Travelled back to Takoradi

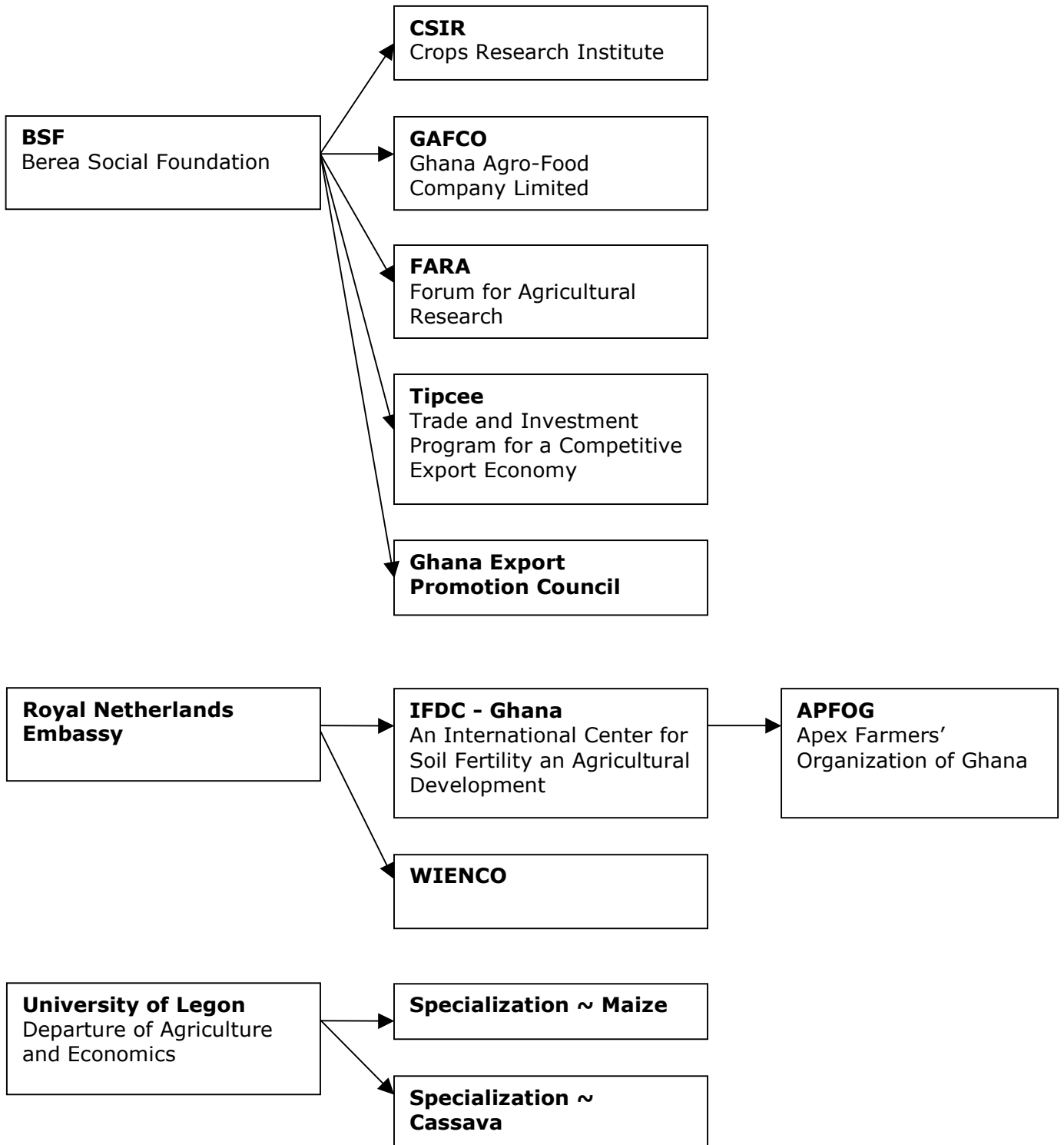
6th June 2006:

- Interview with Ben Epton from BSF

7th June 2006:

- Meeting with the farmers in Tarkwa

Appendix 7. Interview reports



APFOG

APFOG is an umbrella organisation which represents farmers in Ghana. At the moment they are busy for 34 farmer based organisations, each organisation includes about 300 or 400 farmers. APFOG gives information and support to farmers, retailers, transporters and more. They take care of farm materials, seeds and chemicals without a brand name but with a good quality. With this support it is possible to produce maize and cassava on a larger scale.

The interview was with Gabriel Mills, Fredrick B. Boampong (programme officers) and Juliet Biney (Executive Secretary) and lasted 43 minutes.

Category 1. Usages of the products

- The member farmers produce the products maize and cassava on a small scale
- 85% for consumption and 15% for the local market
- It is possible to produce and market more products. This depends on
 - Better planting material
 - Resources as farm machinery, capital, land
 - Fertilizer
 - Education
 - Drying and storage facilities

Category 2. Location

- The member farmers produce to feed their own families. At home, the products will be processed into local dishes
- The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries. Just 1% is sold outside Ghana.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of APFOG

- The development of Ghana will accelerate within the next years
 - The infrastructure will be build up -> better and cheaper transport
 - More resources will become available -> higher yield per acre
- Farmers will see their crops more as a commercial product.
- The standard of living will go up and the country will develop quicker

Local market

- The local market won't change much in the first 3 till 5 years. Changing people's habits will take a longer period.
- In the next ten years the household consumption will consist but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets.

West African market

- The surrounding countries are less developed than Ghana. There is more famine and will develop slower as Ghana.
- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing the products can be transported and sold in these surrounding countries.
- The Ghanaian government also started with a marketing program (= agribusiness development program) which will probably give some sales increase in the next 3 till 5 years.

World market

- The production and transportation costs of the Ghanaian farmers are too high to compete with world market prices.
- Ghana must develop further before they can compete at the world market, this will take at least 10 years.
- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Farm machinery
 - Educated and experienced workers
 - Capital
 - Planting material
 - Transport facilities
 - Drying and storage facilities

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- Exploring the West African markets
- Government started marketing programs

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak
- Natural conditions ~ No irrigation systems, less technology
- No or less drying and storage facilities
- No information, planning and control within the supply chain

BSF Berea Social Foundation

Berea Social Foundation (BSF) is an NGO in the SUSCAP-project. It originated in the Berea Baptist Church and they share office. The church and ISCOM founded a NGO to help the poor people.

The interview was with the pastor B. Epton (manager) of Berea Social Foundation and lasted 29 minutes.

Category 1. Usages of the products

- The farmers produce maize and cassava on a larger scale as in former times.
- Previously a farmer produced to eat and the products which were left over were sold 95% for consumption and 5% for the local market
- Now Farmers produce on a larger scale (better resources), more products are sold 80% consumption 20% local market

This change is an effect of the promotion from governmental organizations, to sell more products and through a larger production the last years.

- There are still not enough products to feed all Ghanaians so it is important to raise the production. It is possible to produce and market more products but the farmers need
 - Better planting material
 - More resources as capital, farm machinery and land
 - Education
 - Storage facilities

Category 2. Location

- The farmers produce to feed their own families. There are still not enough products to feed all Ghanaians, so more products are necessary.
- The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries.
- There are companies which buy the products just after the harvest. The products will be stored properly and in the lean season the products will be brought back. The market prices are their higher and the farmers must pay much more for their products.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.

Category 3. Expectations of BSF

- The development of Ghana will accelerate within the next years
 - The infrastructure will be build up -> better and cheaper transport
 - The poultry industry is upcoming -> higher demand of maize and cassava
- Farmers will see their crops more as a commercial product.
- The standard of living will go up and the country will develop quicker

Local market

- The local market will develop slowly in the next 3 till 5 years.
- In the next ten years the household consumption will continue to rise, farmers are producing more to feed their families. But because of better resources and knowledge it is possible to produce more than necessary for consumption. These extra products can be sold at the markets.
- The poultry industry is an upcoming industry in Ghana. These animals need to be fed by maize and cassava. This will influence the market as well because of the continuing demand for the products.
- Ghanaian people like to learn a more effective way of doing business from the developed countries

West African market

- The surrounding countries are less developed as Ghana and they can always use the maize and cassava from Ghana.
- The Ghanaian government also started with a marketing program (= Agribusiness development program) which will probably give some sales increase in the next 3 till 5 years.

World market

- Ghana must develop further before they can compete at the world market, this will take at least 10 years.
- Internal factors that contribute to a shift in sales between the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Farm machinery
 - Educated and experienced workers
 - Money
 - Planting material
 - Transport facilities
 - Drying and storage facilities

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for agricultural products
- Ghanaian people like to learn doing business on a more sustainable way and more effective (from the developed countries)
- Government started marketing programs

Negative aspects (Weaknesses, threats and difficulties)

- Ghana is not well known in the rest of the world for its maize and cassava.
- The infrastructure is still very weak
- Natural conditions ~ No irrigation systems, less technology
- No or less storage facilities in the Tarkwa area

CSIR – Crops Research Institute

The Crops Research Institute is responsible for the development of new varieties and appropriate technologies for farmers to increase vegetable and fruit crop production in Ghana.

The interview was with Dr. E. Moses (pathology of tropical fruits and vegetables) and Mrs. Joyce Haleegoah (Maize) and lasted 43 minutes.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize and cassava on a small scale
- 90% for consumption (their own family food security) and 10% for the local market. If they produced more as an acre the products will go to the urban market.
- Cassava: the demand for starch is increasing, so some farmers trying to become a more commercial farmer and deliver cassava to the starch factory.
- Maize: Maize is usable for processors, poultry industry and household consumption. In the traditional zone they are producing maize mainly for the market. Buyers buy from the farm gate or will come to a local market point.
- It is possible to produce and market more products. This depends on
 - Better planting material
 - Resources as farm machinery, capital, land and storage facilities

Category 2. Location

- The farmers produce to feed their own families. There are still not enough products to feed all Ghanaians, so more products are necessary.
- At home, the products will be processed into local dishes. The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries. Just 1% is sold outside Ghana.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of CSIR

- The development of Ghana will accelerate within the next years
 - Building more starch factories so a higher demand of cassava
 - The infrastructure will be build up -> better and cheaper transport
 - More resources will become available -> higher yield per acre
- Farmers will see their crops more as a commercial product.
- The standard of living will go up and the country will develop quicker

- The last years there has been no shortage in maize.
- It will be profitable for the farmers to store the maize and to sell this maize after the bulk season.

Local market

- In the next years the household consumption will still consist but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets or at factories. The farmers will earn more money through the sales of their products that they can buy other products.

West African market

- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing the products can be transported and sold in these surrounding countries which have more famine as Ghana.
- The Ghanaian government also started with a marketing program (= agribusiness development program) which will probably give some sales increase in the next year. In 2 year you will really see a difference.

World market

- The production and transportation costs of the Ghanaian farmers are too high to compete with world market prices.
- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Planting material
 - Transport facilities
 - Drying and storage facilities (you can't dry the products in the forest or in a very humid area as the Tarkwa area)
 - Fertilizer

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- Government started marketing programs

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak
- Natural conditions ~ No irrigation systems, less technology
- No or less drying and storage facilities

FARA – Forum for Agricultural Research in Africa

FARA is the Forum for Agricultural Research in Africa, an umbrella organization bringing together and forming coalitions of major stakeholders in agricultural research and development in Africa. FARA complements the innovative activities of national, international and sub-regional research institutions to deliver more responsive and effective services to its stakeholders. It plays advocacy and coordination roles for agricultural research for development, while the national agricultural research systems (NARSs), advanced research institutions (ARIs) and international agricultural research centers (IARCs) develop improved technologies along the research-to-development continuum in their respective countries and coverage areas.

FARA's vision is to enable Africa to achieve at least 6% annual growth in agriculture by the year 2020 through enhanced research and adding value to its products, consequently increasing food security, alleviating poverty and sustaining economic growth.

The interview was with Sidi Sanyang (Scientific Research Person) and lasted 28 minutes.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize and cassava on a small scale
- Consumption of maize is mostly in Ghana
- The production goes up and these will be enough to be exported to other countries.
- Cassava: the demand for starch is increasing, so some farmers trying to become a more commercial farmer and deliver cassava to the starch factory.
- Maize: To add value 1. Process it into quality flour or 2. Package the maize proper.
- It is possible to produce and market more products. This depends on
 - Better planting material
 - Resources as farm machinery, capital, land and storage facilities

Category 2. Location

- The farmers produce to feed their own families.
- At home, the products will be processed into local dishes. The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries.
- The local market is the most common outlet, the people are familiar with this market, the farmers know these market and the prices at the local markets.
- The West African market is available, the surrounding countries have more famine and can always use the products from Ghana.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of FARA

- The market for maize and cassava will definitely develop in the next five years. Because there is the demand for both maize and cassava.

- The challenges for Ghana are
 - Market information
 - Adding value – process the raw materials to make it uses easier
 - Infrastructure improvements – roads
- The maize and cassava market will take more than five years to develop.
 - The sectors need to be organized
 - The key -> innovation approaches -> the roles need to be changed
 - Private sector for market
 - The infrastructure will be build up -> better and cheaper transport
- Added value will definitely increase one's income. The standard of living will go up and the country will develop quicker
- The attractiveness of the products will increase

Local market

- In the next years the household consumption will still consist but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets or at factories. The farmers will earn more money through the sales of their products that they can buy other products.

West African market

- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing the products can be transported and sold in these surrounding countries.
- The sectors will become more organized.
- The private sector will be involved and help to develop the infrastructure to export the products to the West African countries.

World market

- The production and transportation costs of the Ghanaian farmers are too high to compete with world market prices.
- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Transport facilities
 - Drying and storage facilities

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- Private sector involvement (infrastructure, market, health of the farmers, micro finance)

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak
- Natural conditions ~ No irrigation systems, less technology
- No or less drying and storage facilities

GAFCO

Ghana Agro-Food Company Limited (GAFCO) is a holding company for eight Agro Industrial companies involved in the manufacture of basic food products. The operating companies, all housed at GAFCO's integrated industrial complex located in the port of Tema, Ghana, produce various products including wheat flour, animal feed, canned Tuna, fish meal and related products.

GAFCO was formed by Industrie-Bau Nord AG and the Government of Ghana to hold the assets of the former Tema Food Complex Corporation under the government's program to privatize state owned enterprises.

GAFCO's corporate aim is first, to be the leading producer of quality primary food products in Ghana and second, to be a principal exporter of these products to the west African region and to Europe. The company seeks to produce products of consistent high quality, to ensure a reliable supply to the market and to offer these products at competitive prices. The goals are to be achieved through the realization of a strategy developed by IBN labeled "Integrated Agro Industrial Processing".

The interview was with Klaus Kuebler (Tech & Agro products Manager) and Samuel Seddoh Jr. (Agro Sales Coordinator) and lasted 55 minutes.

Category 1. Usages of the products

- The Ghanaian farmers produce maize and cassava on a larger scale as in former times. The variety and potential is there but they can't produce enough.
- Previously A farmer produced to eat and the products which were left over were sold 95% for consumption and 5% for the local market
- Now Farmers produce on a larger scale (better resources), more products are sold 80% consumption 20% local market
- The price of maize is fluctuating a lot, this depends on the seasonality (major/minor season). Processors prefer a stable price which is the reason to import maize from US, South Africa or Ukraine.
- Last year there was less maize produced in Ghana. A lot of maize is imported to Ghana. This year there was a big amount of maize but for the amount was too big for the market. It is possible to produce and market more products but the farmers need
 - Better planting material
 - More resources as capital, farm machinery and land
 - Education
 - Storage facilities

Category 2. Location

- The farmers produce to feed their own families, the products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- There is a market for maize and cassava within Ghana. There are enough processors which prefer to buy Ghanaian products above imported products. But they want to agree on a stable price and a guarantee to deliver.

- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- A difference between Ghana and the competitors in the world market is the stable market price that countries outside Ghana have for their products. Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall. In Ghana there is a major, minor and lean season without good storage facilities which make it hard to continue a stable market price.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.

Category 3. Expectations of GAFCO

- The development of Ghana will accelerate within the next years
 - The infrastructure will be build up -> better and cheaper transport
- The quality in Ghana is good. The variety and potential is there but the Ghanaian farmers can't produce enough
 - More resources will become available -> higher yield per acre

Local market

- The local market won't change much in the first 3 till 5 years. The demand of maize and cassava will be their, all Ghanaian consume maize and cassava or a processed variant.
- In the next ten years the household consumption will consists but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets.

West African market

- The surrounding countries are less developed than Ghana. There is more famine and will develop slower as Ghana. At this moment 20% of the products is transported to this neighboring countries (registered and not registered).
- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing more products can be transported and sold in these surrounding countries.

World market

- The production and transportation costs of the Ghanaian farmers are too high to compete with world market prices. If the development of Ghana's infrastructure continues it will be possible that GAFCO is dealing with the Ghanaian farmers in the future. This infrastructure development will take at least 5 years but there are many factors that can disrupt this growth.
- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Farm machinery
 - Capital
 - Planting material
 - Transport facilities
 - Drying and storage facilities

Positive aspects (Strengths, opportunities and chances)

- Ghana has a lot of knowledge and resources to perform well
- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products and they are still looking for new markets
- Cassava: Cassava is easy to produce and the demand is rising because the factory can use the processed cassava; starch, in the potatoes chips.

Negative aspects (Weaknesses, threats and difficulties)

- Transport ~ The infrastructure is still very weak
- In Ghana the humidity is very high, so bacteria have more chance to damage the crops.
- Natural conditions ~ No irrigation systems, less technology
- Illness and diseases ~ No or less drying and storage facilities
- Low education
- No information, planning and control within the supply chain
- No or bad packaging
- Less starch factories, the distance to the factory is far from the Tarkwa area. The cassava has a lower quantity of starch during the long transport.

Ghana Export Promotion Council

Ghana Export Promotion Council (GEPC) is the National Export Trade Support Institution, facilitating the development and promotion of Ghana's Non-Traditional Exports.

It was established by NLCD 369 in 1969 as an agency of the Ministry of Trade and Industry with the mandate to develop and promote Ghanaian exports. Our focus has primarily been to diversify Ghana's export base from the traditional export products of Gold, Cocoa Beans, Timber Logs and Lumber and Electricity. Currently, there are over 300 different non-traditional Export products categorized into Agricultural, Processed/semi Processed and Handicrafts.

GEPC is positioned in the national export system as a coordinating pivot for the various public and private sector trade agencies involved in trade development and facilitation.

The key programmes include:

Market Access Facilitation For Export Companies

Technical Advisory Services on Export Product Development

Trade Information Services

Export Related Human Resources Development (Ghana Export School)

Some areas for investment in the export sector:

Agro Processing Facilities

Tools & Machinery For Mechanized Mass Production

Packaging Materials And Accessories

Information Technology For Marketing & Product Development

Cooling Infrastructure For Fresh And Processed Products

The interview was with Adjei Yeboah office manager and lasted 10 minutes.

Category 1. Usages of the products

- The farmers produce maize and cassava on a larger scale as in former times.
- The quality of the products produced in Ghana can be the same quality as in the rest of the world.
- There is less control on prices, there is not a fixed price or any contracts.
- The government of Ghana made a special Initiative to export within West Africa; MISTOWA- project (Market Information Systems in Traders Organizations in West Africa).
- It is possible to produce and market more products but the farmers need
 - More resources as capital, farm machinery and land
 - Education
 - Storage facilities

Category 2. Location

- At this moment, the products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.

Category 3. Expectations of GEPC

- The development of Ghana will accelerate within the next years
 - The infrastructure will be build up -> better and cheaper transport
 - The poultry industry is upcoming -> higher demand of maize and cassava
- Maize: The export market for maize is already better and will develop further in the next years. It will accelerate more after the first 5 years. At the moment there is a market for the products but the farmer won't see this yet. The government will look further for markets, especially in West Africa, to give the farmers the opportunity to export their products. In the future, farmers will see their crops more as a commercial product.
- Cassava: In Ghana there is a big starch factory and there are plans to build more factories. The market potential is good. The export promotion council promotes the processing of cassava in starch in Ghana and the starch export to Europe.

Local market

- The local market will develop slowly in the next 3 till 5 years.
- In the next ten years the household consumption will continue to rise, farmers are producing more to feed their families. But because of better resources and knowledge it is possible to produce more than necessary for consumption. These extra products can be sold at the markets.

West African market

- The government of Ghana made a special Initiative to export within West Africa; MISTOWA- project (Market Information Systems in Traders Organizations in West Africa). This will probably increase the export within Africa and hopefully also in the rest of the world.

World market

- Ghana must develop further before they can compete at the world market, this will take at least 10 years.

- In Ghana there are less resources or resources with a lower quality as in the rest of the world. These resources are:
 - Infrastructure and transport facilities
 - Educated and experienced workers
 - Money
 - Drying and storage facilities (before export)

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- The market for the products; maize and cassava, is there. In Ghana, West Africa and the rest of the world

Negative aspects (Weaknesses, threats and difficulties)

- Ghana is still a developing country, the infrastructure is still very weak
- Natural conditions ~ No irrigation systems, less technology
- No or less storage facilities in the Tarkwa area
- Expensive to set up and organize a good export market/ economy

IFDC – An International Centre for Soil Fertility and Agricultural Development

IFDC is an international organisation. They have their headquarters in the United States. The main funding is from the Dutch and American government and some small others. IFDC has projects all over the world but most of them are in West Africa. They have offices in Senegal, Mali, Burkina Faso, Ghana, Benin, Togo and Nigeria.

One of the projects is the MISTOWA-project; Market Information Systems in Traders Organizations in West Africa. That project is mainly focused on Intra Regional Trade, with intra regional trade they are talking about trade within West Africa. They are trying to improve the trade within West Africa.

IFDC have selected some commodities; maize and cassava are two of them. They are trying to give out market information on these commodities; prices, availability, markets etcetera. For example: the farmers in Tarkwa can look at the internet and see what the prices are in the rest of West Africa, so they can sell them wherever they want.

There is also bidding and asking on the website, so people can ask and offer a commodity at the internet.

The interview was with Manon Dohmen (Economist/ Association Specialist) and lasted 17 minutes.

Manon Dohmen gave me extra names, addresses and phone numbers which were very useful for the rest of my research.

Royal Netherlands Embassy in Ghana

The interview was with Wilma van Esch (First Secretary/Dev. Cooperation and Environment) and lasted 54 minutes.

Most of the poor countries have a poverty reduction strategy. Ghana has also a growth and poverty reduction strategy. This strategy is about how to create an equal distribution within Ghana without future damage.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize and cassava on a small scale
- 90% for consumption (their own family food security) and 10% for the local market. Cassava: the demand for starch is increasing, so some farmers trying to become a more commercial farmer and deliver cassava to the starch factory.
- Maize: Maize is usable for processors, poultry industry and household consumption. In the traditional zone they are producing maize mainly for the market. Buyers buy from the farm gate or will come to a local market point.
- It is possible to produce and market more products. This depends on
 - Better and constant/ guaranteed input of planting material
 - Resources as farm machinery, micro credit and storage facilities

Category 2. Location

- The farmers produce to feed their own families. At home, the products will be processed into local dishes.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.
- There is less interest in products as maize and cassava in countries outside Africa. Only when the products are first processed into animal feed (maize) or starch for potato chips and mashed potato powder (cassava).

Category 3. Expectations of the Royal Netherland Embassy

- The development of Ghana will accelerate within the next years
- Farmers will see their crops more as a commercial product. The government and farmer based organizations will help and fund this development.
- It will be profitable for the farmers to store the maize and to sell this maize after the bulk season.
- The total agricultural production will increase in the next years. Maize and cassava will accompany with this increase.

- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Micro credit
 - Constant and guaranteed supply input
 - Constant and guaranteed price
 - Transport facilities included infrastructure
 - Drying and storage facilities

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- There is some sustainable growth
- Ghana is working for a equal distribution of income

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak
- No or less drying and storage facilities
- Less communication
- It is hard to get micro credit
- Less education about the market situation
- There are plans but they won't be implemented

Technoserve**Tipcee - Trade and Investment Program for a Competitive Export Economy**

Trade and Investment Programme for Competitive Export Economy (TIPCEE) will target smallholder farmers that already have begun to integrate into commercial marketing chains. It is important for the offer or to strengthen the role of women as owners of small/medium size enterprises, as smallholder farmers, and as productive workers in processing and marketing activities. For instance, it is estimated that 60% of Ghanaian farmers are women. The challenge is to find those commercially oriented women farmers and include them in our target groups. Furthermore, credible research has shown that women spend their income on their children and household needs, with positive long-term developmental impacts. The contractor also will be expected to reinforce the efforts of food aid cooperating sponsors, other interested NGOs, and donor organizations using its own resources, but over time these development partners will be expected to cost-share with the contractor. A critical aspect of activities is on lining large and medium-size agricultural enterprises to foreign buyers and joint venture partners in overseas markets whereas linking smallholders to modern supply chains for agro-processing and exporting using traders, trader organizations, large commercial farms and BDS providers.

The interview was with Takyi Sraha (Business Specialist) and lasted 53 minutes.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize and cassava on a small scale
- Consumption of maize is mostly in Ghana
- Maize and cassava are growing markets
- Cassava: the demand for starch is increasing, so some farmers trying to become a more commercial farmer and deliver cassava to the starch factory.
- Maize: the maize can be processed in animal food or be packed well before exported outside Ghana. These processed variants will be more profitable.
- It is possible to produce and market more products. This depends on resources as farm machinery, capital, land and storage facilities

World market

For Ghana it is very hard to compete with the competitors in United States. Ghana is still developing and has to deal with problems which are already solved in the US. The developed countries have a good infrastructure, irrigation systems, fertilizers, processing and drying facilities, transport possibilities and a marketing promotion budget. Ghana needs support to survive this competition. They need working capital to start building a kind of export economy.

Category 2. Location

- The farmers produce to feed their own families. At home, the products will be processed into local dishes. The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries.
- The local market is the most common outlet, the people are familiar with this market, the farmers know these market and the prices at the local markets.

- European market is the traditional export market from Ghana. The United States are too far and have also a lot of restrictions to enter the market which it makes difficult for Ghana.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of Technoserve

- The market for maize and cassava will definitely develop in the next five years. Because there is the demand for both maize and cassava.
 - The infrastructure will be build up -> better and cheaper transport
 - The sectors need to be organized
- Added value will definitely increase one's income. The standard of living will go up and the country will develop quicker

Local market

- In the next years the household consumption will still consist but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets or at factories.

Export market (West African of world market)

- Ghana will try to follow the rest of the world and try to build an independent export economy. This will take at least ten years. In the next couple of years you can see some little difference but it will take a longer time to see a real export market for maize and cassava.

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- Ghana is close to Europe. By sea the products can be on any destination in Europe within 11 till 15 days
- Maize and cassava are growing markets
- There is a market for the agricultural products
- Private sector involvement (infrastructure, market, health of the farmers, micro finance)

Negative aspects (Weaknesses, threats and difficulties)

- There are a lot of competitors, especially from United States.
- Changing consumption pattern in Europe, strengthened by big promotion activities organized by the US.
- Ghana is a developing country
 - The infrastructure is still very weak
 - Natural conditions ~ No irrigation systems, less technology
 - No or less drying and storage facilities

University of Legon

The interview was with Dr. Akwasi Mensah – Bonsu (Cassava) and Dr. Irene Gyrir (Maize) and lasted 55 minutes.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize (white maize) and cassava on a small scale and these farmers eat their own products first. This is the tradition in Africa.
- Farmers produce products 100% for consumption (their own family food security).
- Cassava: There is a local market for cassava and no commodity price for cassava.
- Maize: the maize market is fluctuating. If farmers produce maize and there is a lot of maize produced, the price will go down. The farmer will produce something else in the next season. But the price of the maize will go up because of shortage and then they choose to do maize again. And this will continue year after year.
- The quality of the products produced in Ghanaian is good but this depends on the end use. For example, the farmers producing white maize (for home consumption), they try to sell the products which are left over to a chicken farm, but those need yellow maize so they won't get much money for the products.
- It is possible to produce and market more products. This depends on
 - Better planting material
 - Fertilizer
 - Resources as farm machinery, capital, land and storage facilities

Category 2. Location

- The farmers produce to feed their own families. There are still not enough products to feed all Ghanaians, so more products are necessary.
- At home, the products will be processed into local dishes. The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries. Just 1 % is going outside Ghana.
- The local market is the most common outlet, the people are familiar with this market, they know the market and the prices at the local markets.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of the experts of the University

- The development of Ghana will accelerate within the next years
 - The infrastructure will be build up -> better and cheaper transport
 - More resources will become available -> higher yield per acre
- Farmers will see their crops more as a commercial product.

Local market

- The local market won't change much, probably people will get more to eat because of a better production through the developments.

West African market

- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing the products can be transported and sold in surrounding countries which have more famine.
- The Ghanaian government also started with a marketing program (= agribusiness development program) which will probably give some sales increase in the next 3 till 5 years.

World market

- The production and transportation costs of the Ghanaian farmers are too high to compete with world market prices.
- Ghana must develop further before they can compete at the world market, this will take at least 10 years.

There are a lot of organizations who try to help to built Ghana. It will go step by step a bit better. This will take a very long time, but in ten years you will see some changes especially in the infrastructure. The way of farming will go better because of the increasing number of resources and skills.

- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Farm machinery
 - Educated and experienced workers
 - Capital
 - Drying and storage facilities
 - Planting material and fertilizer
 - Transport facilities (infrastructure)

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- Government started marketing programs
- Exploring the West African markets
- Government started marketing programs
- The border is not a barrier.

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak (very high transportation costs)
- Natural conditions ~ No irrigation systems, less technology
- Bird flew, a lot of chicken farms (feed maize)
- No governmental subsidizes
- Ghana keeps losing the competitive advantage in the world market
- Less resources; No irrigation systems, drying and storage facilities
- No information, planning and control within the supply chain

WIENCO

Wienco (Ghana) Limited established in 1979 is a joint venture Ghana-Dutch Company involved in businesses in the Agricultural sector. The core business of the company is importation and distribution of fertilisers and other agricultural inputs. It can be said that the name Wienco is synonymous with fertilisers and agricultural improvement in the country, both organic as well as in-organic.

Wienco's partnership is with the following ordinary shareholding:

50% Dutch nationals

50% Ghanaians.

The interview was with Marc Kok (Industrial Maize Project Manager) and lasted 38 minutes (in Dutch).

The agriculture is the start of every developing economy. When it is going well with the farmer it will go well with the whole economy. Unfortunately the farmers won't see this yet. They prefer to see first a market before they want to invest a lot of time and money in producing products. They are scared that those products become a waste of time and money because there is no market. In the last years the farmers had always been the group that is disappointed, so they lost faith.

Category 1. Usages of the products

- Most Ghanaian farmers produce the products maize and cassava on a small scale and these farmers eat their own products first. This is the tradition in Africa.
- 90% for consumption (their own family food security) and 10% for the local market. If they produced more as an acre the products will go to the urban market.
- Cassava: There is no world market for cassava, but there is a market for the processed variant of cassava, starch. Cassava is growing when the soil is sandy. The yield and quality in Ghana is not very good because no use of fertilizers. The amount that they produce is for local uses.
- It's possible to create a good export market for cassava/ starch. In Ghana is a big starch factory but the yield is to low.
- Maize: The beer breweries in Ghana are willing to buy the Ghanaian maize for sustainability. They are even ready to pay a certain amount extra for this maize. But this certain amount has a limit, and if the price of the farmers goes over that limit the brewery will import the maize.
- Maize is using a lot of nitrogen out of the soil. The fertilizer for the maize is very expensive because they don't have natural manure matter.
- It is possible to produce and market more products. This depends on
 - Better planting material
 - Fertilizer
 - Resources as farm machinery, capital, land and storage facilities

The farmers don't have trust in the other links of the supply chain!

- Contracts
In Ghana people won't follow up this contract.
- Payment
The farmer needs to get their payment quick because they need it to live and to buy new material for farming. But most of the time they get it much later so they prefer to sell their products at the local market for cash money.
- Prices
The prices at the internet (inclusive transport to or in Europe) are different as what the farmer gets for their products. They don't understand that there is a quality, packaging and transport difference.
- Weight
At the moment they let the product weigh it seems to be a less as it really should be.
- First a market or first a production???? ("What was first? Chicken or the egg")
If the farmer works hard and produces a lot there is not a market, so it's a lost in the eyes of the farmer. But before others take care of a market they will see a good production to fulfill this market.

Category 2. Location

- The farmers produce to feed their own families. There are still not enough products to feed all Ghanaians, so more products are necessary.
- At home, the products will be processed into local dishes. The products which are not used for consumption will be sold at the local markets or will be transported to surrounding countries. Just 1 or 2% is sold outside Ghana.
- The farmers are not only the first link of the chain but also the centre of a circle. The farmer in the middle and around them the facilitators; the government, the bank, the processor, the input suppliers, the transporters and the extension department. If it is going well with the farmer the rest of the chain members will have profit of this. But if one of the facilitators won't follow up the agreement everything falls apart, and the one with the biggest lost is the farmer. In the past this happened more than ones and the farmers haven't any trust leftover.
 - o For example, a farmer has a contract with a processor to sell the product but if he can sell the same product to a higher price or cash money he will do that. At that moment he has some extra security and money to live. Of course the processor won't like this and the next time it is the other way around.
- The West African market is available as well, the surrounding countries have more famine and can always use the products from Ghana.
- The World market is relatively hard to enter and not very profitable because of the relatively low market prices. The competitors outside Ghana have better resources, producing a better yield per acre and have more and cheaper transport possibilities.
- The largest difference between Ghana and the competitors in the world market is the quantity and quality of resources. This makes it hard for Ghana to compete with these players.
- Ghanaian farmers can't plan and communicate the expected harvest results because of natural influences such as the quantity of rainfall.

Category 3. Expectations of WIENCO

The market in Ghana is fluctuating very much. Normally the price will go up in the off season, but for example last year the prices dropped. This will continue till the moment that a good regulation system is set. Because of the need of money it is hard to organize deals and contracts. If a farmer can chose between a lot of money when they sell the maize at the open market (because the price is high) or following the contract for less money they will chose for the first. The processor or brewery has no maize and has to get his maize from somewhere else. Next time he arranges the maize earlier without the Ghanaian farmer.

This will continue till the moment that someone can go to a judge and let the contract rule.

- The agriculture is the start of every developing economy. But in Ghana there is no agricultural policy.
- It will be profitable for the farmers to store the maize and to sell this maize after the bulk season.

Local market

- In the next years the household consumption will still consist but because of better resources and knowledge it is possible to produce more. These extra products can be sold at the markets or at factories. The farmers will earn more money through the sales of their products that they can buy other products.
- The poultry industry is an upcoming industry in Ghana. Farmers use maize and cassava to feed the chickens. If this kind of farming is expanding, the maize and cassava market will go up as well. The only threat is the birth flew, we hope it is not continuing.

West African market

- If Ghana is developing well (5 till 10 years) and the quantity of the products is increasing the products can be transported and sold in these surrounding countries which have more famine as Ghana.
- The Ghanaian government also started with a marketing program (= agribusiness development program) which will probably give some sales increase in the next year.

World market

Ghana can't deal with the world market because of their low yield per hectare and the high transport prices within Ghana.

1. The farmers in America produces around 7,8 ton of maize per hectare in Ghana is this less as 1 ton of maize per hectare. Because of this use difference in amount of production is the cost price in Ghana much higher.
2. The transport price of Brazil to Africa is around \$ 30,- and the transport from the farmers in Tarkwa to Tema is also \$30,-.

The price of production is higher and the price of transport is the same or higher in Ghana. Ghanaian companies prefer to do business with other Ghanaian companies/farmers. They will even pay a certain amount more for domestic products, but there is a limit.

Long term

There are a lot of organizations who try to help to built Ghana. It will go step by step a bit better. This will take a very long time, but in ten years you will see some changes especially in the infrastructure. The way of farming will go better because of the increasing number of resources and skills but the expectation is that the farmers have still no or not much trust. This is a process that will take a longer time.

- Internal factors that contribute to a shift between the sales at the markets. In Ghana there are less resources or resources with a lower quality. These resources are:
 - Planting material
 - Fertilizer
 - Transport facilities (infrastructure)
 - Drying and storage facilities (you can't dry the products in the forest or in a very humid area as the Tarkwa area)

Positive aspects (Strengths, opportunities and chances)

- The soil and climate are favorable to deliver high-quality products
- There is a market for the agricultural products
- Tarkwa area ~ lot of goldmines, these workers has to eat very health food, because this market can't delay. Fresh vegetables will be a good opportunity.
- Government started marketing programs

Negative aspects (Weaknesses, threats and difficulties)

- The infrastructure is still very weak (very high transportation costs)
- Natural conditions ~ No irrigation systems, less technology
- Bird flew, a lot of chicken farms (feed maize)
- Tarkwa area ~ Starch factory very far away. Maize a long transport before they can export.
- No governmental subsidizes
- Less resources; No irrigation systems, drying and storage facilities

Appendix 8. Definitions units

1 Acre	=	4046,85642 m ²
1 Hectare	=	10.000 m ²
1 Ton	=	1000 Kilogram
1 US Bushel	=	35,239072 liter
	=	25,401 kg maize

Appendix 9. Final research planning

