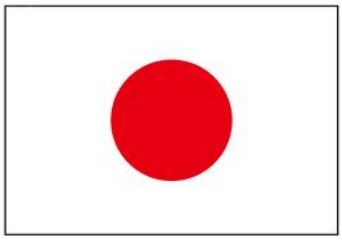
FY 2011 Study commissioned by the Ministry of Agriculture, Forestry and Fisheries of Japan



Study on Measures to Enhance Investment into Agricultural Sector in Africa

FY 2011 Summary Report

March 2012

CROSSINDEX Corp.

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Acronyms

1. CIG	Common Initiative Group
2. CRI (CSIR-CRI)	Council for Scientific and Industrial Research Crops Research Institute
3. CVC	Committee Villager of Dialogue
4. FBO	Farmer Based Organization
5. FDI	Foreign Direct Investment
6. GAEC	Ghana Atomic Energy Commission
7. IFAD	International Fund for Agricultural Development
8. IITA	International Institute of Tropical Agriculture
9. IRAD	Institute of Agricultural Research for Development
10. JIRCAS	Japan International Research Center for Agricultural Sciences
11. MAFF	Ministry of Agriculture, Forestry and Fisheries
12. MoARD	Ministry of Agricultural and Rural Development
13. MOFA	Ministry of Food and Agriculture
14. NGO	Non Governmental Organisation
15. ODA	Official Development Assistance
16. PNDRT	Roots and Tubers Market-Driven Development Programme
17. PPRSD	Plant Protection & Regulatory Services Directorate
18. TICAD	Tokyo International Conference on Africa Development

1. Outline of the Study

1.1 Background

Japan, in TICAD (Tokyo International Conference on Africa Development) IV (May 2008), has pledged to contribute to the development of African states, by means of doubling FDI (Foreign Direct Investment) and ODA (Official Development Assistance) into the region. As one of the considerations, MAFF (Ministry of Agriculture, Forestry and Fisheries) intends to carry out a study focusing on root and tuber crops cultivated in Sub-Sahara Africa (with particular emphasis on cassavas and yams). The study focused on 2 African countries; Ghana (West Africa) and Cameroon (Central Africa).

Yam and cassava are widely consumed as staple food in various areas in the region while constrained to low productivity due to situations such as primitive farming method, low fertility of soil, agricultural pest, etc. This study was conducted with an expectation to identify the constraints inhibiting private sector investment into each of the stages of yam and cassava value chain, and endorse measures to overcome those constraints and promote investment into the sector. Details of the recommendations are documented in the main report, with the essence explained in this presentation report.

1.2 Aim of the Study

The study is expected to:

A) Identify constraints inhibiting private sector investment into each of the stages of their value chain

B) Recommend measures to overcome those constraints and to promote investment into the sector.

The overall goal of the study is to:

Ensure secure and stable food supply to people of Sub-Sahara Africa region. Consequently, this is expected to contribute to the global food security.

Goals of this study:

- Increase the production of yams and cassavas.
- Reduce the loss rate in the post harvest.
- Keep high quality.
- Explore new market.

1.3 Activities

Focusing on yams and cassavas, which are produced and consumed as important staple foods in Sub-Sahara Africa, we, CROSSINDEX Corp. have identified issues that may be inhibiting private sector investment into the sector. Measures have been

recommended with consideration to the current situations in each stage of the value chain:

- Production/ Agriculture
- Storage/ Processing/ Transportation
- Distribution/ Retail
- Domestic Consumption/ Export

Apart from the local interview survey, the following field tests have been conducted.

Field test 1: Test the optimization of mechanized yam seed cultivation of the farmers associations

Create ridges for yam cultivation in two farmers associations of Northern state. Tests have been conducted in order to determine the possible cost reduction by comparing a case where tractors were used and only people for the other.

A small size ridge for seed yam cultivation and a mid-sized ridge for mid-sized yams for export were made. One of the ridges was made using tractors and the other ridge was done by manpower to determine the amount of time required to build for each. At the same time mounds used for regular yam were also created.

Field test 2: Tasting of processed yam and cassava

Two types of tasting of processed yam and cassava were conducted at a restaurant for mid-high earners in Accra, Ghana. The first tasting was about 4 types of yam and cassava products which were yam chips, cassava chips, fried yam, and fried cassava. At the same time, a tasting of bread with cassava flour mixed was also conducted. Four combination ratios of cassava flour were prepared: 0%, 10%, 50% and 70%. The differences between the responses for each were examined.

Cost observation test: Examining the possibility of selling yams at high prices due to adjustments of the shipping season by the farmers associations

This is to monitor exporters and the farmers associations to learn about the fluctuations of market and export prices of several types of yam. By checking the level of fluctuations with trade and export prices, a simulation to determine the farmers association's price negotiation ability and whether farmers could expect an increase in profit through shipping season adjustments was conducted.

The details of this report are documented in the main report, but the essence is also available in this summary.

1.4 Duration

The Study was scheduled to be conducted as follows:

Experts committee meetings
Japan (September 2011 – February 2012)

- MAFF, Tokyo Univ. of Agriculture, Waseda Univ., JIRCAS, Tokumoto technology corp. ltd, etc.

Interview, Research and Field Study
Ghana (October – November 2011)

- Interview and Research: Government organizations, processors, researchers, NGO, exporters, associations, farmers.
- Field Study: Tasting test of Yam and Cassavas (Accra), Using tractors for making ridges (Tamale).

Cameroon (November 2011)

- Interview and Research: Government organizations, processors, researchers, NGO, distributors, associations, farmers.

Policy Dialogue and Workshop Meeting
Ghana (February 2012)

- Policy Dialogue and Workshop Meetings: Government organizations, processors, researchers, NGO, exporters, associations, farmers.

Cameroon (February 2012)

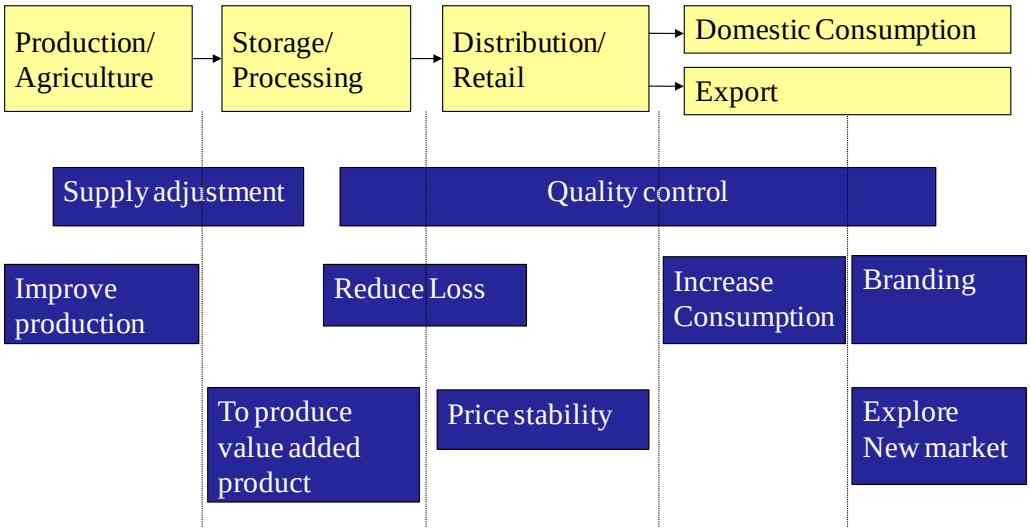
- Workshop Meetings: Government organizations, processors, researchers, NGO, distributors, associations, farmers.

2. Findings on Yam and Cassava Industries in Ghana and Cameroon

2.1 Constraints in Each Segment of the Value Chain

Here are some of the constraints along the value chain, which will be the main points for this survey.

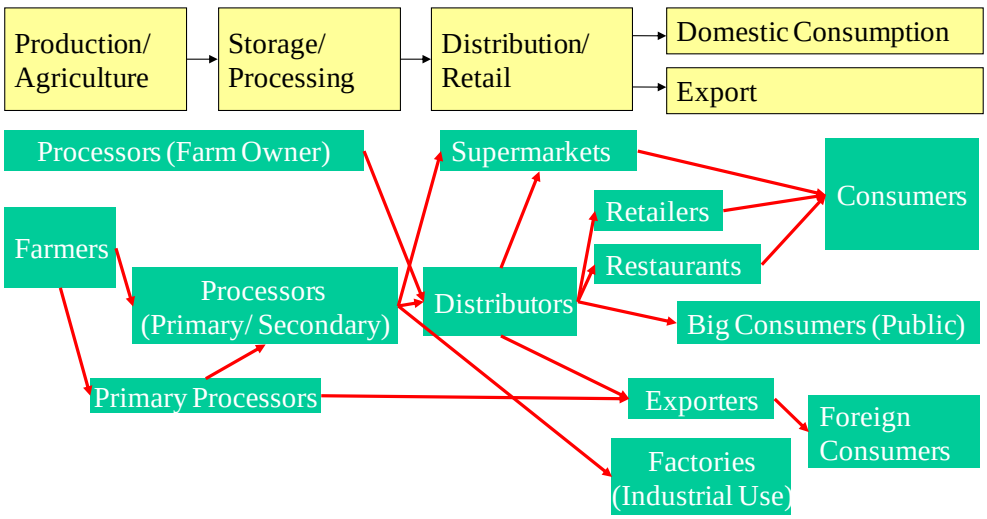
- Constraints of Yams and Cassavas along the Value chain -



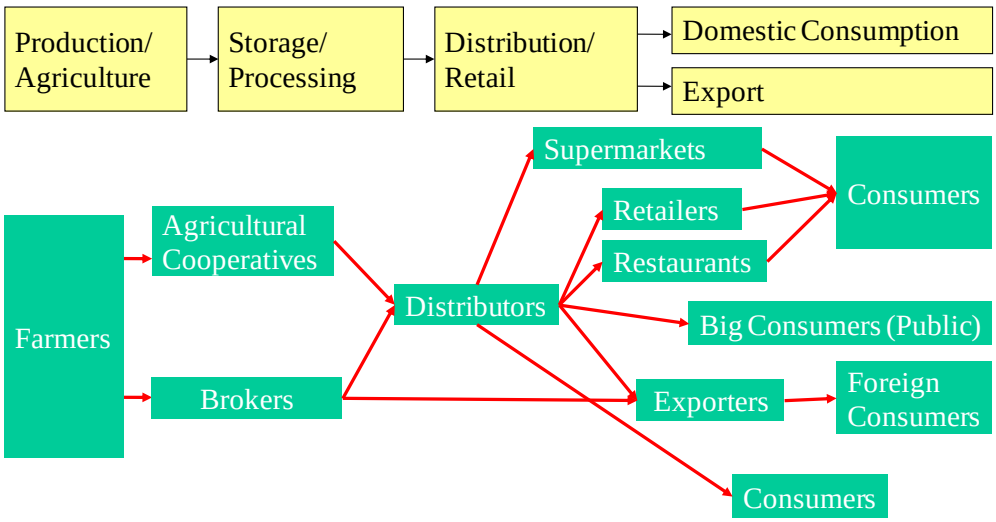
2.2 The Players in the Value Chain

The main players in the value chain are shown below.

- Value chain of Processed Products (Yams & Cassavas) -



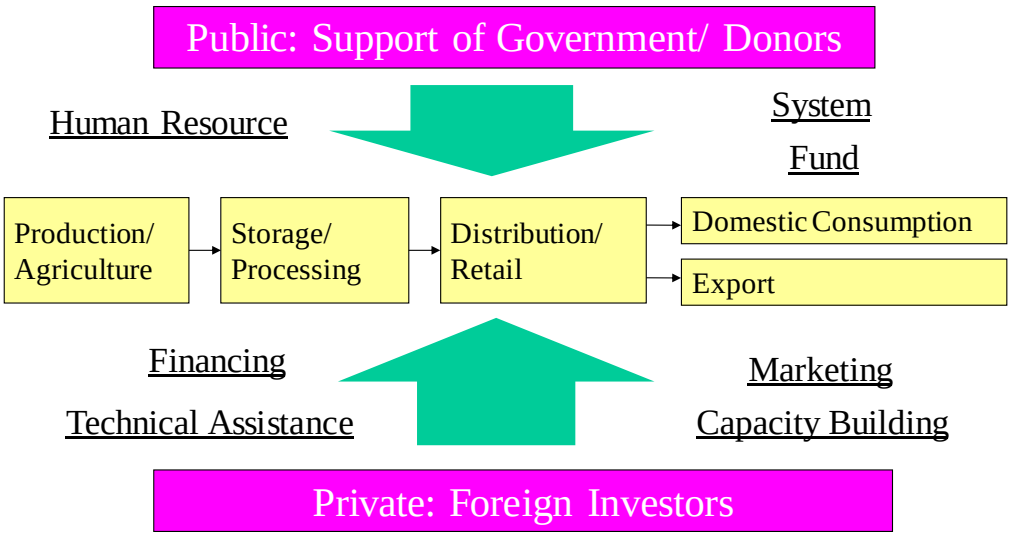
- Value chain of Raw Yam Supply -



2.3 The role of government/ international agencies and investors

The roles of support from the government and foreign investors are shown below.

- Investment & Supporting points -



3. Constraints and Solutions along the Value Chain

3.1 The Value Chain Constraints

On the base of study in Japan and interview in Ghana and Cameroon, we could find some serious constrains in each stage of yam and cassava value chain as below:

Production/ Agriculture	Storage/ Processing/ Transportation
Pest & Disease	Storage technology
Quality of seeds, planting materials	Storage of seeds
Machine & Maintenance	Processing technology
Labor	Value-added yams & cassavas
Crop rotation	Lack of facilities
Lack of price information	Transportation loss
Cultivation	Keep quality of yams & cassavas
Training	
Monitoring	

Distribution/ Retail	Domestic Consumption/ Export
Distribution loss	Value-added yams & cassavas
Keep good grade of yams	Promotion
Market loss	Marketing
Shortage of cassava supply for value added	The brand name of Ghana and Cameroon
Products	Packaging
	Lack of foreign market information

The solutions to the constraints which arose at each stage of Production/ Agriculture, Storage/ Processing/ Transportation, Distribution/ Retail, Domestic Consumption/ Export are shown below.

3.2 Production/ Agriculture

Proposal 1　A distribution model of improved planting materials (seed yams and stems of cassava) from farmers to farmers.

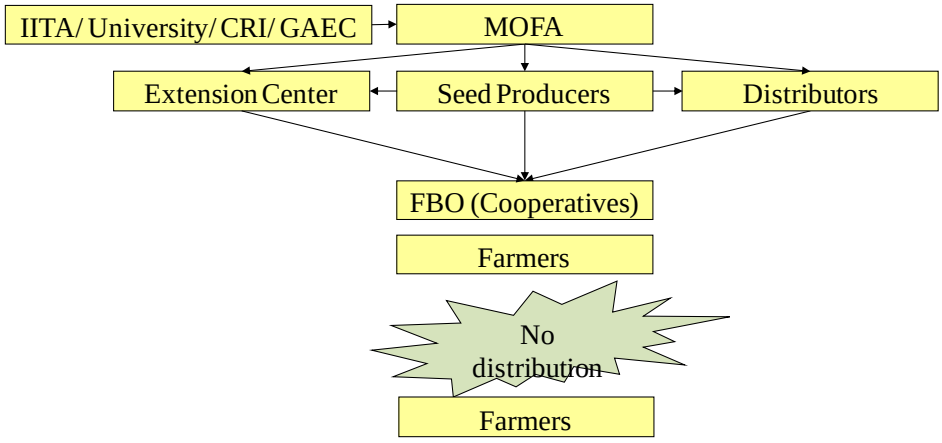
In Cameroon and Ghana, improved planting materials are necessary in order to increase production volume of yam and cassava. The improved planting materials, which are more resistant to diseases and can expect larger harvest volume, are necessary.

In Cameroon, these improved planting materials are developed by organizations such as the IITA, IRAD, and IFAD. They are being distributed from the extension centers, seed producers (planting materials producers), and distributors through the farmers associations (CIG, CVC) to farmers under the supervision of the MoARD/ PNDRT. In Ghana, these are developed by the IITA, CRI, University and distributed from the MOFA, extension centers, seed producers (planting materials producers), and distributors through the farmers associations (farmer based organizations, cooperatives).

However, the distribution from farmers to farmers isn't working well. This is due to the trend that farmers are selling the improved planting materials (seed yams and cassava stems) at high prices to other farmers or using these only for their own purpose.

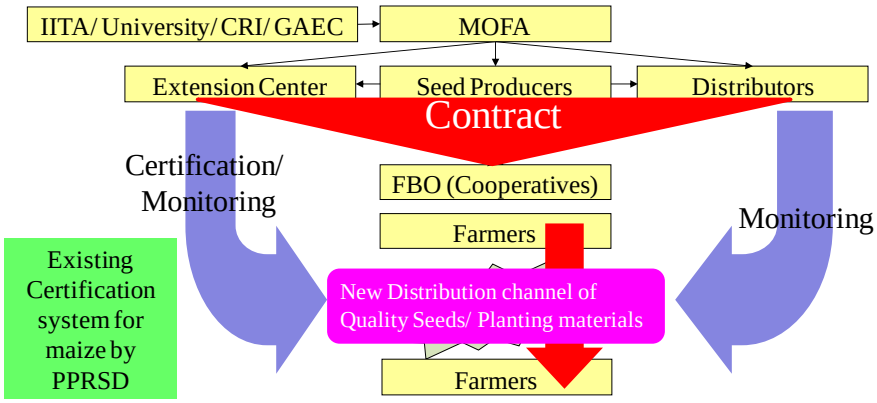
- Supply chain of the Improved planting materials -

- 1. Present Model -



To solve inefficiency of distributing improved planting materials (seed yams and cassava stems), we propose new model named as "Farmer to Farmer Distribution model" and "Certification systems" which are effective to accelerate distribution of the improved planting materials.

- 2. Potential Model -



In order to put this model (Farmer to Farmer Distribution model) into effect, a contract is necessary between the extension centers, seed producers (planting materials producers), distributors (middle man) and the farmers associations. With their help, it will become possible to monitor the distribution of improved planting materials from farmers to farmers.

In order to benefit the farmers, the improved planting materials will not be distributed for free and a system, which enforces to sell at low price will be developed. On top of this farmers who provide certain amount of improved planting materials with high quality will be certified as a favorable farmers and a commendation will be given to them by the extension centers.

An obligatory provision, which promotes the distribution of high quality improved planting materials at low prices to other farmers will be set up. A monitoring system with penalties in order to ensure people follow this provision will also be decided.

The contents of the contract, which will be a sample of the suggested model are shown below.

A) Benefit for the contract farmers
   - Make profit as planting materials suppliers.
   - Belonging farmers associations will get more selling power by higher yielding, etc.
   - Certified farmers can get subsidy from the government and guarantee of purchase by distributors according to the certification level.

B) Certification system
   - Certification Score will be determined according to supply amount to the others and quality of the planting materials (seed yam and cassava stem), etc.
   - Grade, Renewal period, etc.

C) Certification Flag (to be put on top of the roof of good farmers)

D) Obligation of the contracted farmers
   - Fixed price distribution to other farmers.

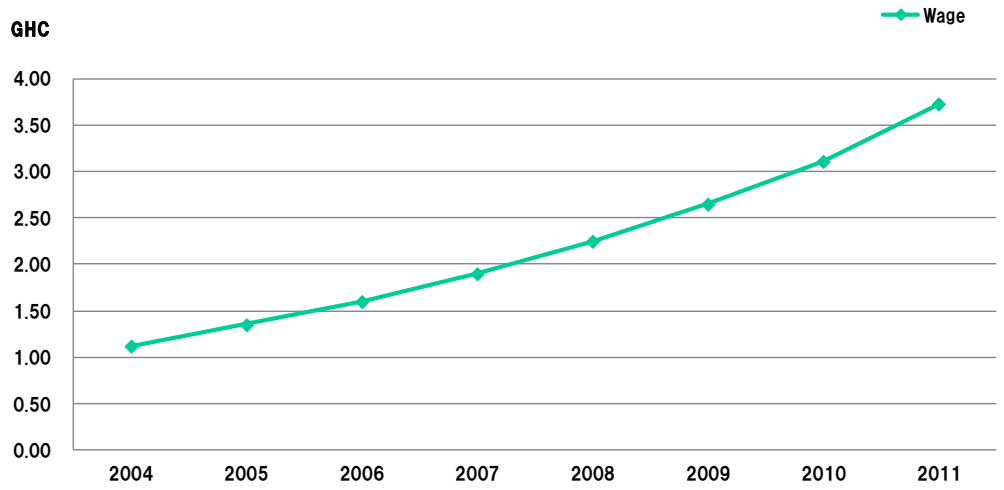
E) Penalty
   - Distribution of wrong material (not improved one) would cause penalty.

F) Monitoring scheme (Sampling, etc.)

Proposal 2 Efficient yam production through the use of agricultural machines and maintenance as well as service education of agricultural machines.

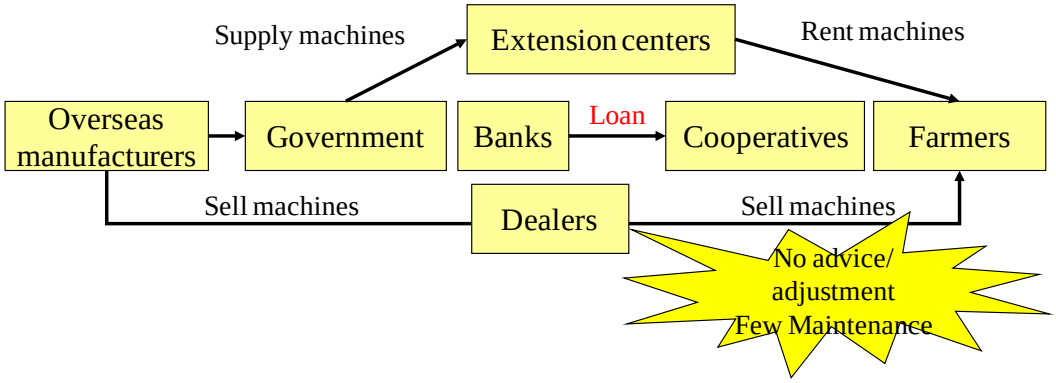
In Ghana, wages inflate yearly and it is becoming more difficult to secure labor forces in rural areas.

- Rapid increase of wage in Ghana -



Mechanization becomes inevitable in rural areas, and the introductions of machines such as tractors are increasing in Ghana. However, besides the shortage of these machines, they are not being used efficiently.

- Current machine distribution flow -

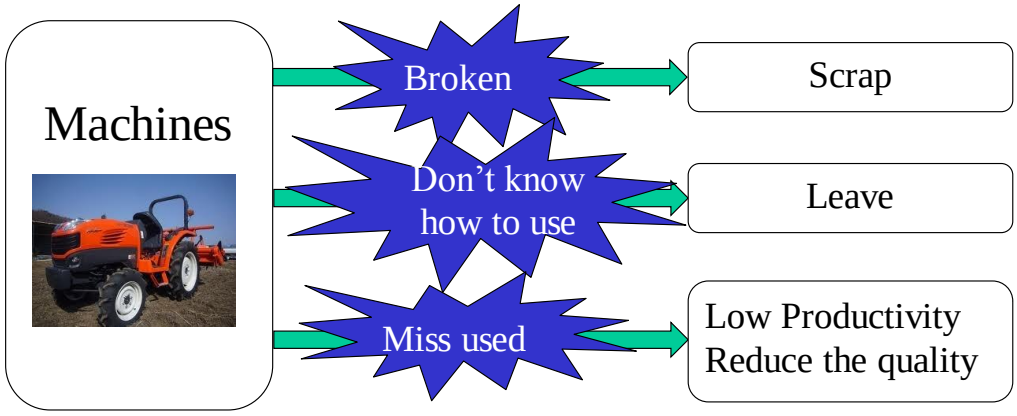


Dealers who handle tractors would like to sell the machine itself, and are not very willing to sell spare parts, which aren't as profitable. They also don't provide maintenance services.

Not developed machine maintenance services
- Insufficient spare parts
- Few repair services
- Few people can adjust machine settings (low productivity)

As a result, the agricultural machines are not used effectively and it is hard to improve product efficiency.

- Current situation of Agricultural machines -



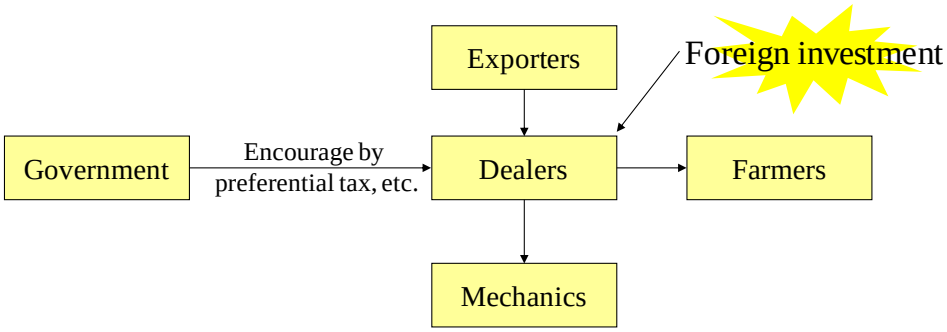
In order to solve such issues, we, CROSSINDEX Corp. suggest the following solutions.

Solution
- Encourage foreign investors to set up dealers in Ghana.
  - to adjust machine settings to local (efficient production)
  - to provide spare parts
  - to provide repair service
  - to train local mechanics to learn how to do above
- Training farmers how to use machines

The government will be in charge of the training of agricultural machines to farmers. Other tasks will be the responsibilities of private dealers and the government will be supporting them.

There is the possibility of starting the maintenance business, not only by agricultural machine dealers, but also by other dealers such as construction machines dealers and motor vehicles dealers. The foreign companies also have some chances to invest in this field.

- Solution model -

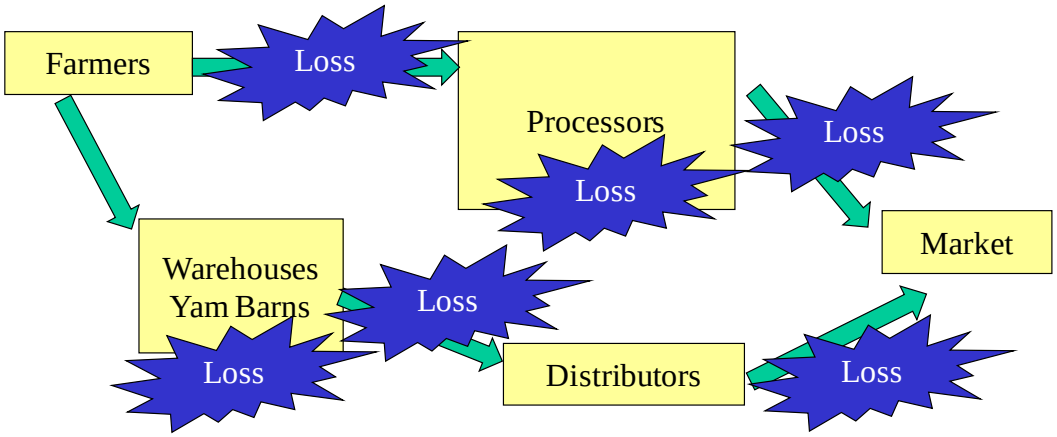


3.3 Storage/ Processing/ Transportation

Proposal 3　Processing at an early stage

The increase of loss rate at the postharvest stages such as preservation, processing, and transportation as well as the decrease of product quality are becoming a serious issue.

- High loss rate and quality reduction in each stage -



For example, insufficient warehouses and warehouse equipments which contribute to protect products in farming villages are the reason for increasing loss rate.

- From wild animals, sun, rain, moisture and temperature, etc.

Transportation issues are leading to the increase of loss rate of yams and cassavas in Ghana and Cameroon.

There are the following issues with transportation:

−Bad road condition
−No train network
−Expensive airplane
−Limited access of ships
−Overload on the ships

As a Result:

−Damage on yams and cassavas
−Rotten yams and cassavas
−Ferry sink off, etc.

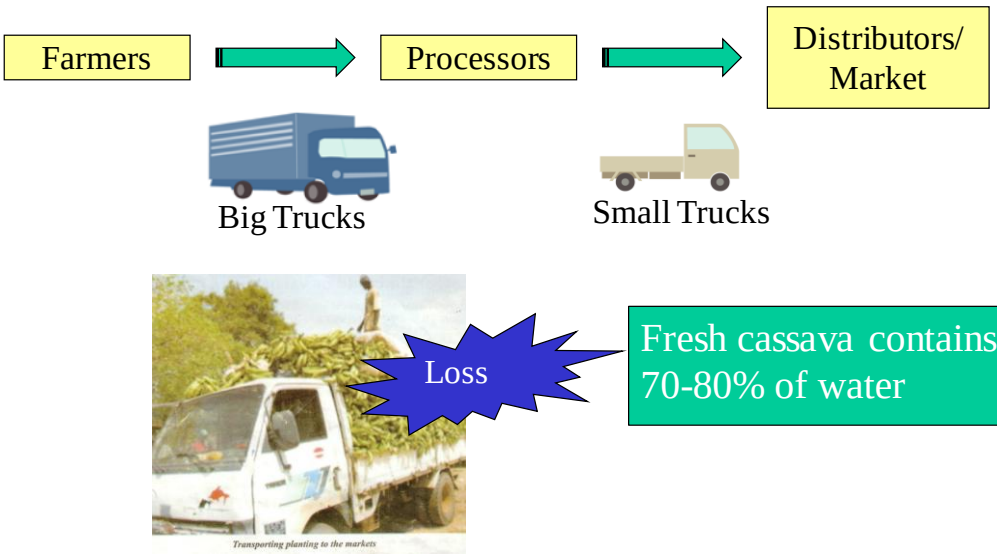
Products and materials are mainly transported by trucks in Ghana and Cameroon. However the severe road conditions are a serious problem.

Currently, large trucks are being used to transport cassavas from farms to processing factories, and small trucks for transporting processed products are to distributors and markets.

After processing in the factories, cassavas weight and mass has been reduced by wringing water. The same large trucks cannot be used to transport to distributors and markets for hygienic reasons as they carry dirt, bacteria, and germs.

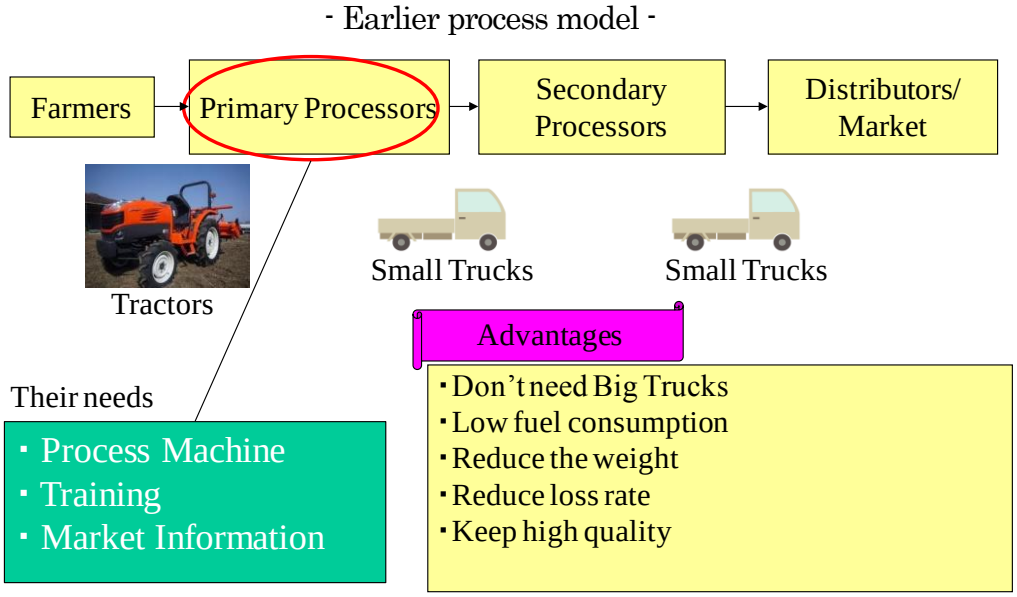
A particular reason for the increase in loss rate is that cassavas hit each other while being transported and get damaged.

- Conventional transportation -



In order to solve such issues, we, CROSSINDEX Corp. suggest "The Earlier process model".

- Earlier process model -



This proposal suggests that farms located near the farm-gate to handle simple primary processing or have the farmers associations to process the cassavas.

This way the raw cassavas will not necessarily to be transported to the processing factories (secondary processors) and result in the reduce of loss rate as they will not get damaged while being transported.

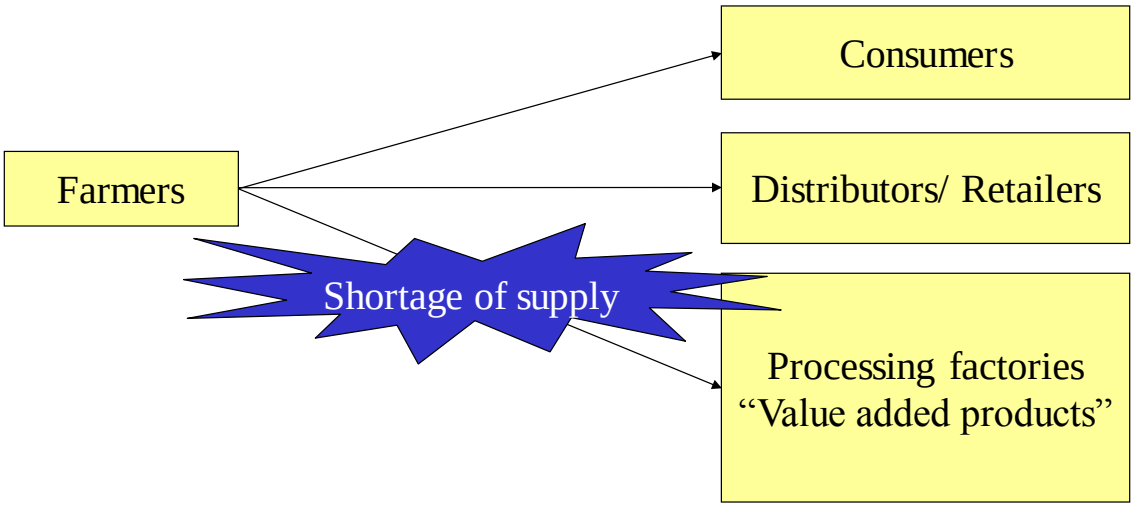
It is also possible to transport more cassavas by processing them early and wringing the water as cassavas contain water 70 - 80%. This proposal makes it possible to solve hygiene issues and use small trucks, which are more fuel efficient by processing at an early stage.

Proposal 4　A model of stable cassava supply to processing factories

In Ghana and Cameroon, there exists the problem of cassava supply shortage to processing factories. This is due to the fact that farmers tend to sell their cassavas to consumers and wholesalers at higher prices, rather than selling to processing factories, which try to buy them at a price as low as possible.

Although processing factories and farmers have a supply contract, these agreements are often ignored.

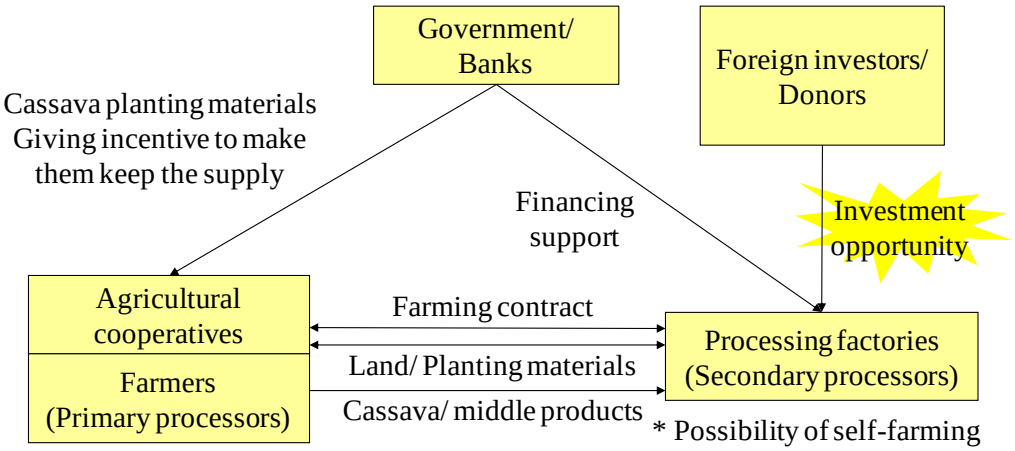
- Shortage of Cassava Supply for Value Added Products -



In order to solve this issue, we, CROSSINDEX Corp. suggest the following model.

- Keep the Cassava supply to the Processing Factories -

■ Potential model



In this proposal, it is essential to set up a system so that the government provides incentives and financial institutions (Banks) can give farming support in return to farmers who provide cassavas to processing factories. When doing so, farmers associations must be organized which will function as the receivers of aid and support from the government as well as financial institutions. The government will also encourage the cultivation of "bitter" cassava which is a suitable breed for processing.

Next, the government and financial institutions will provide favorable tax treatment as well as financial support. This will allow processing factories to be financially more stable. Then, processing factories can provide incentives such as improved planting materials or land for cultivation to farmers who keep the code of their agreements. This will lead to the increase of compliance rate.

There is also the possibility of financial and technical support from overseas, or investments by foreign industries in order to build processing factories.

It is possible to consider processing factories to run their own farmlands. In order to manage the risk of shortage of cassavas supply, they have to have contracts with various farmers to keep the supply.

Another thing to keep in mind is to devise a plan so that farmers are not treated as tenant farmers or servants as in old plantation models.

3.4 Distribution/ Retail

Proposal 5　Distribution of agricultural information through IT systems

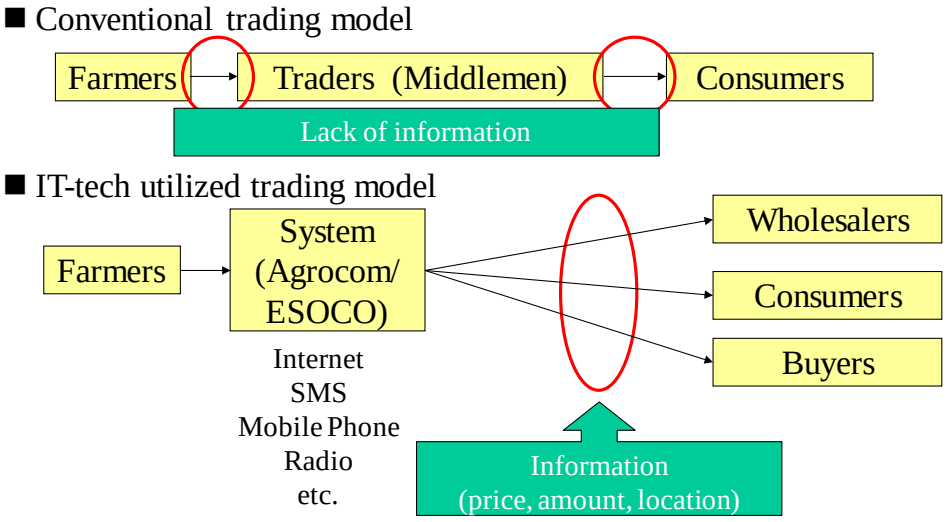
Supply shortage and leftovers, which are caused by inadequate information about the market, are issues concerning the loss of yams and cassavas at wholesalers and retailers. As a result, while those who have more stocks of yams and cassavas can sell their products at lower prices, the price of yams and cassavas in the market, where there are not enough yams and cassavas, goes up unreasonably.

The main reasons for this are lack of information about yams and cassavas, such as price, production place, the supply volume, and about sellers and buyers.

Especially in Cameroon, brokers are very powerful as they have their own network, which enables them to acquire information of situations of farmers and transporters, as well as domestic and foreign market prices.

In order to solve this disparity of information, there is a model, which uses IT technology. There are some organizations in Cameroon called Agrocom, and in Ghana called ESOCO, which provide price information about agricultural products.

- To use internet market data -



The system of Agrocom allows not only farmers but also wholesalers and consumers to use. It enables them to do business easily by communicating with cell phones for example. In the case of ESOCO, they broadcast programs which provide information of agricultural product prices through the radio.

This model makes it possible to prevent abusive actions of brokers towards farmers such as purchasing agricultural products at a low price, which sometimes could be seen in developing countries.

On the other hand there are some points such as the lack of information about processed products should be improved in these systems.

3.5 Domestic Consumption/ Export

Proposal 6　New product development and marketing

After conducting a field test (tasting) as to how consumers would respond to processed yam and cassava products, yam chips turned out to be extremely popular among four types of products (yam chips, cassava chips, fried yam, and fried cassava). As of now yam chips are mostly served in restaurants, but consumption for households may also be considered for the future.

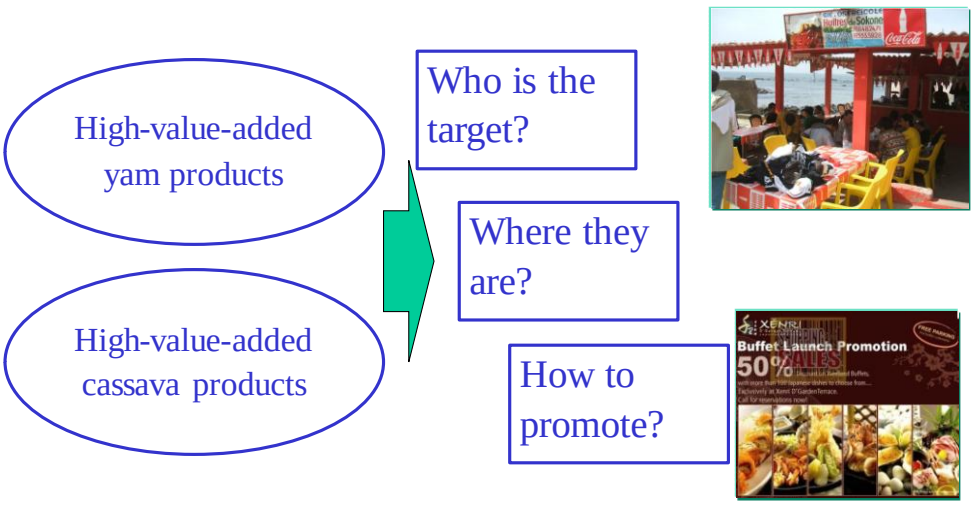
- Result of tasting test (5 Nov. 2011) -

n = 54

	Total
Very good taste (5.0)	48
Good (4.0)	33
Average(3.0)	11
Not so good (2.0)	7
Very bad taste (1.0)	0
Tasting test result of Total	54
Mean score	4.2

Since this kind of consumer monitoring surveys have been implemented in Ghana and Cameroon many times, some marketing points such as to whom the new products are sold, where will they be sold, and promotion methods will become very important.

- Marketing and Promotion as Next Step -



When considering marketing and promotion, it is also preferable to separate "the markets" into the domestic markets of Ghana and Cameroon, neighboring African countries, and foreign markets of Europe and North America.

- Marketing strategy about yam and cassava products -

Yam

Product	Target Market	Constraints
Middle size Yam	Both foreign market and small family, nuclear family in urban areas.	・Production and promotion ・Explore the export market and export way.
Cutting Yam	Domestic market, such as busy business person	・Promotion
Yam starch, Yam flour	Domestic market. It could be used for Easy-to-cook product （ Neat Fufu, etc.）	・Cost reduction ・Yam price is higher than cassava price
Yam processed products	Foreign market.	・Preservation. (need to examine vacuum packaging)

Cassava

Product	Target Market	Constraints
Cassava starch, Cassava flour	Foreign market	・To keep cassava supply for processed factory ・Cost reduction because it will compete against starch made from wheat or potato
Cassava processed products	Foreign market New market needs in urban areas	・Preservation
High valued added cassava products, such as cassava alcohol	Domestic market: Import substitution of foreign alcohol. Foreign market: To sell value added cassava products.	・To keep cassava supply ・Technology assistance for processed factory

4. Conclusion

As a result of this survey, we found some constraints in the value chain of yams and cassavas, such as inefficient of production, loss and quality reduction at post harvest, underdeveloped processing industry, inefficient of distribution and retail, exploring new market.

Details of each constraint are follows:

Constraints of production: inefficiency of distributing improved planting materials and using agricultural machines

Loss and quality reduction at post harvest: insufficient warehouses and warehouse equipment, increase of loss rate and the decrease of product quality of yams and cassavas.

Underdeveloped processing industry: underdeveloped primary processing, cassava supply shortage to processing factories

Constraints of distribution and retail: lack of information about yams and cassavas, such as price, production place, the supply volume, and about sellers and buyers

Exploring new market: lack of some marketing points such as to whom the new products are sold, where they will be sold, and promotion methods

To solve these constraints, we have made following proposals below:

A) Production/ Agriculture:
- Farmer to farmer distribution model and certification system to accelerate distribution of the improved planting materials
- Mechanization and machine maintenance & spare parts market establishment

B) Storage/ Processing/ Transportation:
- Encourage foreign investors/ donors to get into the processing
- Enhancement of earlier processing

C) Distribution/ Retail: Distribution of agricultural information through IT systems

D) Domestic Consumption/ Export: Development of value-added products

Based on our suggestions, stable and sufficient supplies of yams and cassavas products are expected and they will lead to their price competitiveness in each stage of the value chain that will stimulate the new demand.

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