IFAD IITA

HQCF
HIGH QUALITY CASSAVA FLOUR
VALUE CHAIN PROJECT

High Quality Cassava Flour Project Brief

Background

The High Quality Cassava Flour (HQCF) Value Chain project is supported by the International Fund for Agricultural Development (IFAD) and led by the International Institute of Tropical Agriculture (IITA). The project aims at enhancing the competitiveness of HQCF in Nigeria. In a bid to achieve and expand this aim, the project is working towards the following objectives:

- Providing a reliable database and partnerships for prioritizing actions towards the full commercialization of HQCF in Nigeria.
- Training and partnering with the major value chain actors including extension agencies and community-based organizations (CBOs) in Nigeria to introduce modern methods of cassava production such as improved varieties and techniques for handling planting material, mechanical planting methods with the use of fertilizer, and agronomic and mechanical harvesting methods.
- Supporting HQCF processing plants to improve their technical efficiency and overcoming operational logistic hindrances to increase competitiveness.
- Providing adequate training to users of cassava flour, such as the Master Bakers Association of Nigeria, to increase the technical usability of HQCF in bread baking and confectionary products.

Nwaoliwe Gregory, HQCF Training Officer, during the Master Bakers Training at Ewekoro

Early results

1. A database to describe the characteristics of the Nigeria cassava subsector has been developed.
2. The project has tested and introduced an efficient value chain linkage system. See below:

- Scale-based options that secure a regular supply of an adequate quantity of high quality fresh cassava roots to HQCF plants at a competitive price.
- An out-grower approach that links smallholder farmers to nearby markets (processing plants) with binding agreements for the supply of a specific quantity and quality of cassava roots at a specific time and price.
- A socially smart approach for attracting the youth into profitable agriculture and for a win–win outcome.
- A more financially rewarding technical approach for the inclusion of HQCF in making bread and confectionary.

3. The project has built the capacity of value chain actors—cassava producers, HQCF processors, and bakers on monitoring their costs and conducting profitability assessments of their operations to remain competitive.

Profitable production enterprise planning

Planting of cassava with partners in Ekiti, Kwara, and Ogun states is one of the vital parameters our team adopted to enhance the projected aims, objectives, and output. These aims are targeted towards assisting the partners to solve the problems of root shortage, reduce the cost of production, improve agronomic management and mass harvesting techniques, improve marketing by linking the producers to the processors, and conduct comprehensive training of the HQCF users, thereby increasing the profitability ratio and assisting in solving the problem of unemployment among the youth.

A budget was drawn up based on the cost of establishing the hectares of cassava farmland with which the project works. There were some necessary adjustments along the line in respect of activities due to the peculiarity of locations. The cost of some activities had to be increased while some were reduced owing to

labor costs. A total of ₦120, 000 per hectare was used as the budget cost which was disbursed to beneficiaries as needed for each activity in the course of production. Mechanical and manual planting were adopted to establish cassava plantations. Economic data were taken in all project sites in respect of production and HQCF processing.

Outcomes

The mechanical planting method employed has showed the beneficiaries how cost effective it is and its efficiency in terms of turnaround time compared with their manual method. They have also seen it as an option to assist in solving the problem peculiar to all the project sites of a shortage of labor and high labor costs in respect of planting.

The budget has shown the beneficiaries that it is feasible to reduce the cost of production thereby their business enterprise becomes more profitable than before when the cost used was higher. The exercise in data taking was an eye-opener to the beneficiaries on the importance of good record keeping because a lot of the details they had left out initially were recovered and corrected.

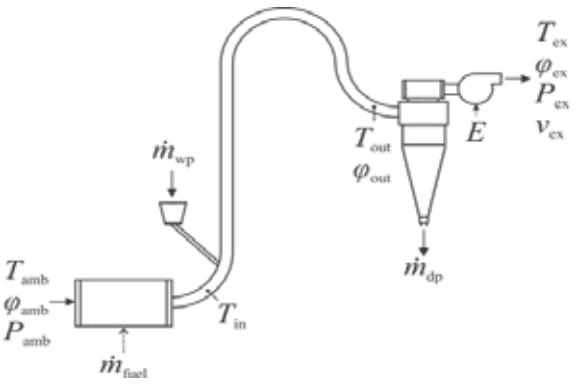
Exercise in taking economic data at Arogunjo Farms Ltd, Asa LGA, Kwara State

Cassava Weed Management

The HQCF Value Chain project has been supporting the Weed Management project of IITA in the modification of a set of imported weeders that are to be adopted for local use in cassava fields. Six modifications were made on this machine that was originally meant for tilling soils in small gardens for planting vegetables, etc. The modifications were aimed at getting a machine that could play a role in mechanically controlling weeds in cassava farms and that was affordable by African small-holders who could buy it for use in the farm or by young people that could acquire and use them as service providers. Now we have a successful machine that can cut weeds efficiently, re-mold ridges and heaps as well as constructing new ones without stress. Our preliminary studies have revealed that the modified machine cuts and crushes the upper parts of weeds and pulls up the roots; it can deal effectively even with tall weeds. The machine is easy to operate and gender friendly.

Flash Dryer optimization

The project is currently making cooperation arrangements with experts in Nigeria to promote the manufacture of efficient and cost-effective machines (especially mechanical drying equipment) for cassava products. The aim is to help cassava processors improve on the current inefficient use of mechanized processing technologies for making various products such as flour, native starch, and odorless fufu.



T	temperature
φ	relative humidity
v	velocity
P	pressure
E	electric energy
$\dot{m}$	mass flow rate

Team HQCF concludes Baseline Survey

The Baseline Survey is a sequence of events being projected to capture situations among participants in the cassava industry, as a result of the present situation and the move to have a positive impact on the people concerned. The survey commenced on 28 October 2015 in four states (Ekiti, Kwara, Ogun, and Oyo). The targeted groups are household cassava producers, cassava processors (which include HQCF processors), input suppliers (stems, tractors, herbicides and other agrochemicals); transporters (trucks, pick-ups, etc.,) and end-users (bakers, confectioners, and restaurant owners). To this end, five enumerators were employed in the survey in each of the four states and four supervisors consisting of HQCF staff (one in each state). They concurrently worked as supervisors and also as enumerators. Trainings were conducted on 23 October 2015 for all the enumerators in each of the four states visited to get them acquainted with questionnaires, their conduct before the respondents, and how to address each respondent, especially those who have difficulty in communicating in English. Survey instruments were distributed to the enumerators, e.g., uniform (T-shirt and cap), pencils, erasers, sharpeners, cameras, and GPS. This uniformity made them recognizable by respondents in each of the places visited.However, the enumerators were not left without some challenges on the field. Some respondents were reluctant to welcome the enumerators. Their complaints were based on failed promises encountered from organizations that had previously visited them. This was overcome by giving out some materials as incentives, such as fruit wine to the village heads and plastic bowls to the respondents.

The numbers of targeted respondents reached in all the four states are as follows:

Household producers	800 (Household producers' questionnaire)
Processors	24 (Processors' questionnaire)
Input suppliers	96 (Input suppliers' questionnaire)
Transporters	96 (Transporters' questionnaire)
End-users	60 (End-users' questionnaire)

The nine-day survey was concluded on 5 November 2015 and all who participated declared their gratitude and knowledge gained.

Quality and standard of cassava product in Nigeria

Dried cassava products were collected from different geopolitical zones in Nigeria (South-south, South-east, South-west and North-central). These products include gari (white and yellow), fufu, lafun, tapioca, starch, poundo cassava, ice-cream cone and high quality cassava flour (HQCF). This was done in order to check the quality of traded cassava products in Nigeria markets vis-à-vis their compliance to regulatory standard. In line with this, the pasting, functional and chemical properties

Fig. 1: Sample preparation for analyses

of all the cassava products were evaluated. The results showed that gari was the most traded product with the other products ranked in the following order; tapioca> fufu> lafun> starch > HQCF > poundo cassava and ice-cream cone. HQCF has the highest peak and breakdown viscosities, while tapioca had the least of all the pasting properties (excluding peak time and pasting temperature). However, the products, locations (except for setback viscosity) and the interactions of the products and locations had significant effect ($p<0.001$) on the pasting properties.

Kpokpo gari has the highest water absorption capacity and ice-cream cone has the least. The least gelation concentration was higher in the HQCF with gari having the lowest, and dispersibility was highest in starch and lowest in kpokpo gari. Gari also had the highest swelling power and solubility index while starch had the least of these properties. All the functional properties were significantly ($p<0.001$) affected by the products, locations (except dispersibility) and the interaction between products and locations. In terms of their chemical composition, HQCF had the lowest moisture content while tapioca has the highest. The total titratible acidity was very high in lafun and low in tapioca while the pH was higher in the ice-cream cone and lower in kpokpo gari. Lafun had the lowest hydrogen cyanide content and kpokpo gari has the highest. However, all the cassava products were within the stipulated standard of the standard organization of Nigeria for the hydrogen cyanide content (< 10 mg HCN/ g) while only HQCF and ice-cream cone were within the standard for moisture content (< 10%). Therefore in order for all the other cassava products to meet regulatory standard, all the standard operating procedures and good manufacturing practices should be established and strictly adhered to in the processing plant.

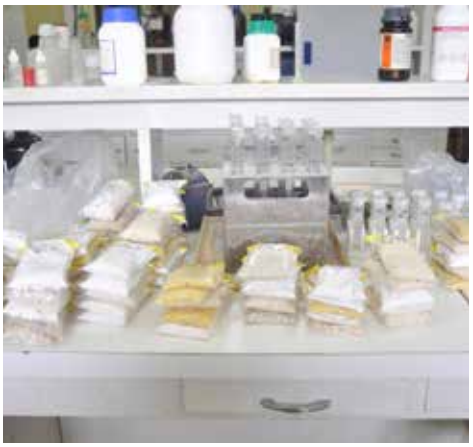


Fig. 2: Some of the samples collected

Upgrades of Ifelodun processing centre

"I cannot find words to express our happiness over the support our cooperative is currently enjoying from the IFAD/IITA Project" Mrs Alade President of the Ifelodun Cassava Processing CICS Ltd, Oyo.

The Ifelodun women cooperative of Oyo are one of the earliest cassava group that have collaborated with IITA on cassava flour processing and highly sought after by the Flour mills of Nigeria PLC, Apapa, Lagos. This is due to consistency in the quality of High quality cassava flour supplied to the factory. The HQCF value chain project has supported the group to procure modern processing machines to further boost the output; the machines include 2 units of high output grater of 3tons capacity per hour, and 1 high powered dewatering machine. A flash dryer and other machine are being awaited from UNIDO support.

The project has also assisted in restructuring the processing flow by re ordering the layout within the wet and dry section of the processing center. The cooperative group has been empowered to increase its processing capacity while maintaining the product quality.

The wet section new layout

Contact

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