FINAL

Enabling poor rural people to overcome poverty

Increasing Performance of the Cassava Industry in West and Central Africa Region (IPCI)

Mission to Republic of Gabon

9th – 14th November 2015

English version

Large Grant Agreement: 2000000473

Mission Team:

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UNIVERSITY of GREENWICH | Natural Resources Institute

SNV

Embrapa

Introduction

The project Increasing Performance of the Cassava Industry in West and Central Africa (IPCI) aims to improve the performance of IFAD financed roots and tuber programmes through technical support and information dissemination.

IPCI works on the demand of individual IFAD country programmes. In October 2015 the Gabon Country Programme Manager (CPM) requested assistance from the project urgently. In response, IPCI put together a short support and fact-finding mission between 9th and 14th November 2015.

The purpose of this mission was to familiarise the IPCI Team with IFAD activities in the Republic of Gabon (RoG). Specifically, the mission supported formulation of aspects of an addendum to the existing IFAD project "Projet de Développement Agricole et Rural" (PDAR).

In this new phase, the project plans to construct 12 warehouses, 3 of which will be developed to include processing equipment and be established as "Business Centres". These Business Centres will demonstrate a range of improved cassava processing methods for traditional products, provide processing services locally, and act as a central assembly point for trading processed cassava products to urban areas, mainly Libreville and Port Gentil.

Mission formulation

This initial mission was conducted between 9th and 14th November. The Team entered and exited RoG through Cameroon and met there with the local IFAD staff. In Northern Gabon, field trips were conducted to local markets and existing small scale traditional processing sites. A longer field trip was conducted to a prospective Business Centre site at Melo village and a previous PDAR funded site at a different location in the same village. The Team met with the IFAD local staff, members of the PDAR supervision team and various Government officials. A list of persons met by the Team is at Annex 1.

The NRI Team consisted of two members from NRI, Prof Bennett, Project Manager and Dr Bechoff, Food Technologist.

Report scope

This report focuses on the actions needed to support PDAR plans for constructing Business Centres. These plans are at an advanced stage, so technical advice on various aspects is needed urgently. A short technical summary of the key cassava products that it is expected to process is at Annex 2.

Key findings

Since its inception in 2007 PDAR has been working in the Province of Woleu-Ntem to increase cassava productivity. In the area of cassava, progress to date has been modest. New planting material has been introduced and around 880 ha of farming area planted across the Province. This has led to production of

somewhere between 5 and 9 thousand tonnes of fresh cassava by project beneficiaries.

Initial plans for processing and marketing cassava revolved around a number of small cassava processing centres. This was not very successful and only one remains in (limited) operation.

The plan now is to construct "Business Centres" at key locations. The Business Centres will provide processing services and bulk products for sale to higher value markets such as Libreville.

Many aspects of the business and management plans for these Business Centres remain opaque and are the subject of on-going discussions at national and project levels. A capacity development consultant is being recruited to document lessons learned from previous or ongoing initiatives, and to suggest a management strategy after consultation of the different stakeholders.

Notwithstanding, plans to build Business Centres are at an advanced stage. Site surveys are on-going and draft building plans have been developed. A schedule to finalise the construction/tender documents before the end of 2015 has been set. Construction is expected in the first quarter 2016. This means that advice on appropriate building specifications and technical specifications for cassava processing equipment are needed urgently.

A rapid assessment suggests that almost no technical capacity to produce or maintain food processing equipment exists in Gabon. What little equipment available is imported from Cameroon or, we believe, China (though the mission found no Chinese equipment, some Chinese producers are advertising that Gabon is one of their clients: see for example- http://www.cassavamachine.net .

A number of traditional and improved cassava products are in demand in Gabon (see Annex 2). In particular and growing demand in urban areas seem to be; 'Baton de Manioc', a fermented, pre-cooked stiff cassava porridge presented in ready-to-boil banana leaf packages of different sizes; 'gari', a fermented and fried granular product that is reconstituted into porridge which sometimes has palm oil included; 'fufu', a ground, fermented cassava flour; and, 'manioc roui, a fermented and fresh cassava paste that is an intermediate product used for the making of several products including 'Baton de Manioc' and 'fufu'.

To increase the scale of production of these traditional cassava products simple fermentation, drying, pressing, milling, grating and packaging operations are needed.

Review of the potential for more 'industrial' scale cassava processing in Gabon seems to suggest that there are few domestic industries ready to accept cassava flour or starch at any scale. Gabon has no domestic biscuit industry. Whilst bakeries are common in rural towns and cities, there has been no attempt to include cassava in this sector. Each Gabonese province has a brewery, so cassava beer might be possible, but, so far, there is no sign that anyone is considering this

possibility. There is no domestic paper-board industry. We are uncertain whether a domestic building material sector exists that might use starch for bonding.

The way forward

We suggest the following immediate assistance that can be provided to PDAR by IPCI.

Development of technical specifications of basic cassava processing equipment

The IPCI Team will review the proposed cassava product list, suggest/recommend technical options. This should include recommendations for maintenance, repair and training.

Action: Serge Abessolo Mba one week after receiving from IPCI

The availability of equipment to PDAR is not well known. The team undertook a quick review of equipment fabricated in Yaounde and found a good range of locally made cassava processing equipment. This needs to be assessed by an IPCI engineer.

Action: Andrew Graffham by end Nov 2015

Since improved gari production is an important element of the Business Centres, there is an opportunity for SNV to contribute its expertise to this element.

Action: BB to discuss possible interventions with SNV by end November 2015.

Support to the design of the Business Centres

The existing Business Centres need to be reviewed by cassava processing experts and recommendations made for changes. To some extent, these activities depend upon the decisions on equipment above.

Action: PDAR to send draft designs to IPCI / BB for review ASAP

PDAR do not have the technical capacity to properly install and commission the new equipment. Neither can they provide training. IPCI can consider a commissioning and training mission in 2016

Action: IPCI to draw up ToRS. BB by end 2015

Each cassava Business Centre will, at full capacity, generate a substantial amount of cassava waste in the form of peels. Options to include these peels in pig rations for the local small scale pork fattening sector or to use them as energy source for gari roasting were discussed.

Action: FUNAAB to further prospect possibilities and opportunities for using the waste, and provide recommendations by end 2015.

Conclusions and recommendations

The mission has developed an initial plan of action for activities in Gabon.

Follow-up:

Finalisation of mission report – 20th November.

Action: BB

All other follow up actions are mentioned above in the way forward.

Annex 1: List of persons met and programme of visits

Date	Action/Location	Person	Designation
9th Nov	Bennett & Bechoff arrive Yaounde		
10th Nov	Yaounde – Oyem		
	Market and processor visits Oyem		
11th Nov	Briefing PDAR	Bernard Hien	IFAD CPM
		Jocktane Ewomba	National Director IFAD portfolio in Gabon
		Serge Abessolo	Director, PDAR
		Jeannot Mbourou	M&E, PDAR
		Hortense Mbondji	Production & Markets, PDAR
		Aymar Hombo	GIS consultant
		Manga Mika	Rural infrastructure consultant
		Eric Missamba	Capacity development , PDAR
		Bernard Bdutsika	Advisor to the Prime Minister
		Jonathan Mboulou	Regional Director, Ministry of Agriculture
	Field trip, Melo		
12th Nov	De-briefing		
	Travel to Yaounde		
13th Nov	Visits to equipment fabricators		
	Final de-briefing		
	Return UK		

Annex 2: Review of production processes for different traditional and improved cassava products

Introduction

This report's aim is to advise the PDAR on the processing equipment to make products from cassava that could help develop the market in Gabon. We may also advise on the possible best processing steps for the selected products.

Sweet and bitter varieties are used in the project area and, therefore, there should not be competition between the processed and fresh products from sweet varieties because bitter varieties can be used for processed products. Different varieties of cassava include:

- Local varieties. Late harvesting but can be kept in the ground between 16-24 months
- PDAR commercial varieties. Short growing time: 9-10 months but can't stay in the ground because deteriorate quickly.
- Disease resistant varieties from IITA

These are listed products (that were mentioned during our visit) available in the Province of Woleu-Ntem, North Gabon:

- Fresh cassava: from sweet variety that is boiled and eaten directly
- Manioc roui: fermented cassava paste
- Baton de manioc: fermented and cooked cassava paste wrapped in leaves
- Fufu: grated and sun dried cassava flour that can be made into a dough by adding boiling water
- Gari: fermented and roasted cassava granules with/without palm oil
- Starch: artisanal and small scale made starch. It is used in Laundry.
- Smoked whole cassava root: cassava root that is peeled, washed, fermented for 2 days and smoked for 3-4 days. It can keep up to a year
- Nkona Mbon: Cassava porridge made by boiling grated cassava and sometimes mixed with with groundnuts
- Cassava cake: mixture of crushed and fermented cassava mixed with ripe and crushed banana that is fried
- (Cut and frozen fresh cassava: sold in the big cities of Gabon)
- Cassava leaves: pounded and boiled cassava leaves sometimes with palm juice

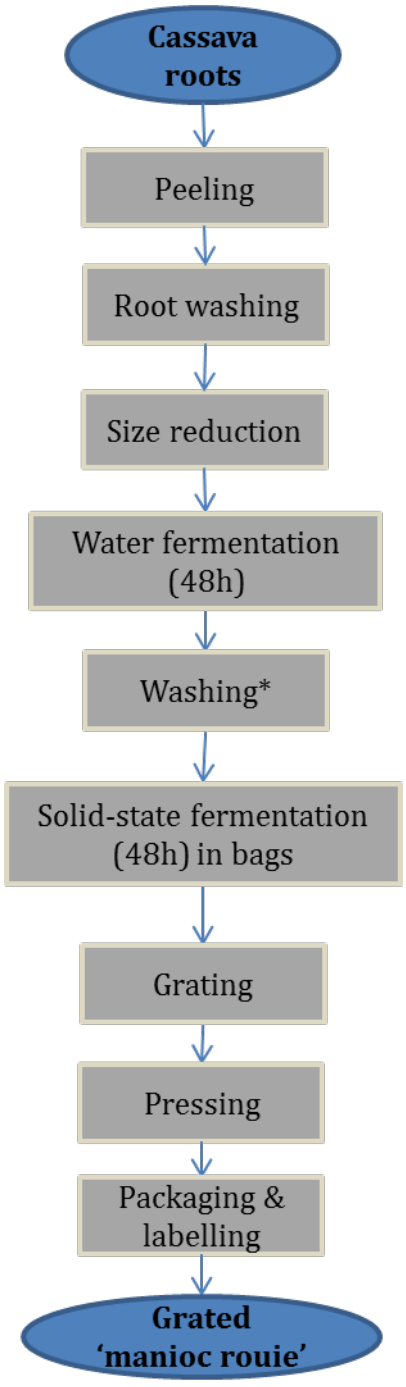
PDAR/ICPI agreed to focus on four products:

- Manioc rouie
- Baton de manioc
- Fufu
- Gari

The processing steps (as described by processors during the field visit as well as suggested improvements) and some proposed equipment to make these products are described in this preliminary report:

1. 'Manioc rouie'. Process

Roots are peeled, washed, cut into smaller pieces and soaked in water for 2 days. On the 3rd day fermented mash is washed to remove the fermented smell. Then the product is placed into bags and fermented for a second time for 2 days and moisture is removed from the product by manually squeezing the bags. The product obtained is called 'manioc rouie'. The product is grated into a mash. Grated 'manioc rouie' value is twice that of non-grated one. We suggest that pressing using a press (manual or hydraulic) may be introduced after the second fermentation. Manual squeezing during the second fermentation may then be limited.

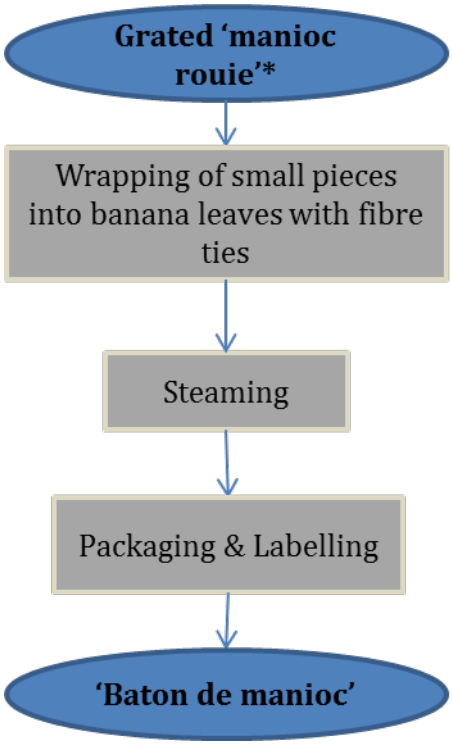


*Washing to remove smell of fermented roots

Step	Equipment
Peeling & Size reduction	Knives
Washing & Water fermentation	Water tanks with drainage at the base
Grating	Grating machine
Solid-state fermentation	Bags
Pressing	Press
Packaging and labelling	Bags & bag sower

2. Baton de manioc. Process.

Grated manioc rouie is made into a homogenous paste. The paste is wrapped into leaves that are tightly closed. The packets are steamed for some hours, cooled down, packaged and labelled.

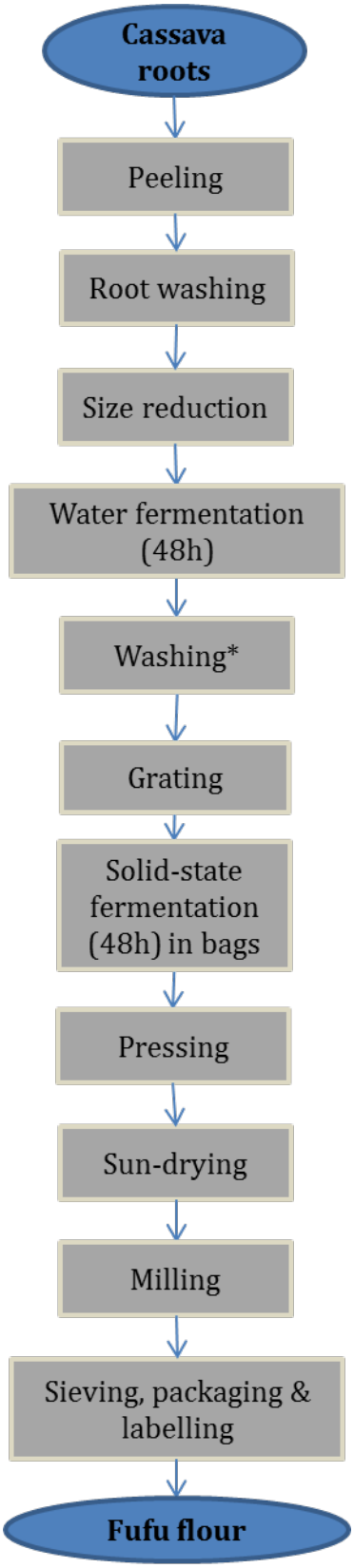


* may need mortar and pestle to smoothen the paste and make it homogenous.

Step	Equipment
Steaming	Steaming bath
Packaging & labelling	Bag sower & bags

3. Fufu. Process

Roots are peeled, washed, cut into smaller pieces and soaked in water for 2 days. On the 3rd day fermented chunks are washed to remove the fermented smell. Then the product is grated and placed into bags and fermented for a second time for 2 days. The fermented mash is pressed as much as possible to remove the moisture and spread in the sun on a raised platform. We suggest to perform the second fermentation on the grated mash and press just before sun-drying in order to remove maximal moisture from the production. Ideally there should be some ventilation of the product (e.g. raised platform and product displayed on mosquito net) in order to accelerate the sun drying. The flour is milled, (sieved), packaged and labelled.

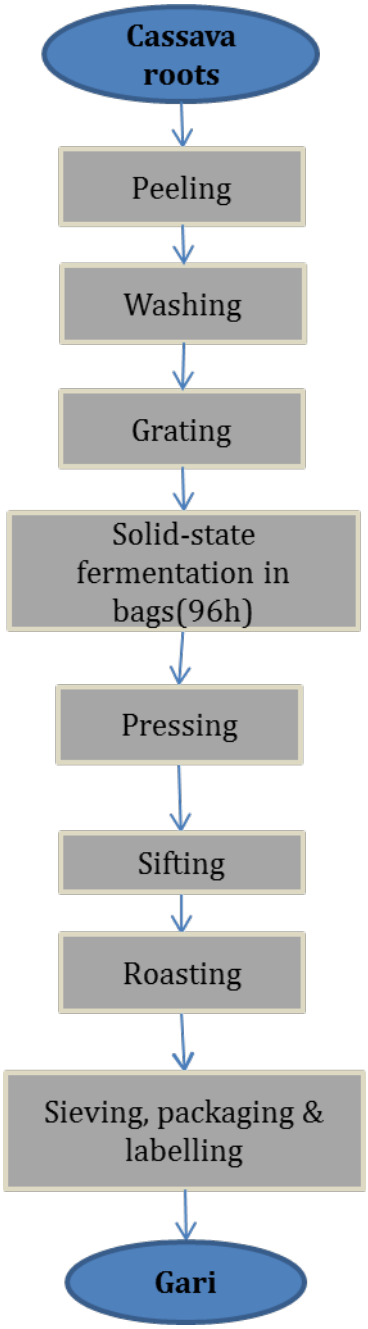


*Washing to remove smell of fermented roots

Step	Equipment
Peeling & Size reduction	Knives
Washing & Water fermentation	Water tanks with drainage at the base
Grating	Grating machine
Solid-state fermentation	Bags
Pressing	Press
Milling	Hammer-mill
Sieving?	Sieves
Packaging and labelling	Bags & bag sower

4. Gari. Process

Roots are peeled, washed, and grated. Palm oil can be adding after grating and should be thoroughly mixed to obtain a homogeneous colour. The mash is placed into bags and fermented for a number of days (e.g. 4-5 days or sometimes less). The mash is then pressed as much as possible and disintegrated in the grater. The disintegrated mash is then roasted. After cooling down the product is sieved, packed and labelled.



Step	Equipment
Peeling & Size reduction	Knives
Washing	Water tanks with drainage at the base
Grating & sifting	Grating machine
Solid-state fermentation	Bags
Pressing	Press
Roasting	Roasting pan
Sieving?	Sieves
Packaging and labelling	Bags & bag sower

Annex 3: Selected photographs

Example of a multi purpose cassava crusher/paster. Oyem main market.

Cassava 'paste'.

Baton du Manioc, Oyem main market.

IFAD funded Cassava Processing Centre, Melo.

IFAD supplied grater/rasper, Melo.

Detail of grater with wood adaption.

	
Grated ‘rouille’ after 3 ‘passes’	Locally made Gari roasting pan, Gabon.
	
Typical small machine fabricator, Douala, Cameroon.	Nb: All photos copyright Ben Bennett