ECP
Esan Cassava Processors

Helping woman to become more efficient

´Modern technology has become a total phenomenon for civilization, the defining force of a new social order in which efficiency is no longer an option but a necessity imposed on all human activity.´
Jacques Ellul

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1 Overview

Nigeria is the largest producer of cassava in the world, with an annual crop of approximately 45 million metric tons. Cassava is processed into gari, starch, tapioca and fufu, and these foods constitute the main staples of Nigeria. Gari is the favoured derivative as it has a longer shelf-life than the other processed products.

70 percent of the labour involved in Nigerian cassava production and processing is done by women in rural areas. Much of this work is labour intensive and can be unattractively describe it as drudgery. Modern, high volume cassava processing equipment and facilities are scarce in Nigeria, and what equipment is available is usually poorly maintained. The need for a structured, localised approach to cassava processing is enormous.

Esan Cassava Processors (ECP) will undertake the establishment of cassava processing plants in rural communities throughout Nigeria, in areas of significant cassava production and where it is the main source of revenue for rural women. Though the project is expected to spread into many rural communities nationwide, the pilot project will be situated in Ekpoma, in the Esan Central Local Government Area of Edo State. The required investment for the establishment of this initial plant is approximately US$57,000.

There are approximately 700 women currently involved in cassava processing in Ekpoma. ECP will establish a mechanized plant where these women can have their cassava tubers processed at a minimal fee. Benefits of this scheme include quicker processing times, leading to reduced crop wastage, which in turn results in a greater profit for these women.

The key difference between ECP and other cassava processing schemes is that the cassava and its derivatives remain the property of the grower/supplier. ECP is solely a service provider, and generates its revenues through a service fee. As such, much of the value added to the product remains the gain of the grower. Because women make up the bulk of Nigeria's cassava producers, improved processing technologies will result in greater economic empowerment for the women of Nigeria.

Socially, the establishment of an ECP plant will alleviate the significant time consumption that is a burden of many women in the cassava industry. This time saved is particularly important, as it allows women the opportunity to expand upon their current activities.

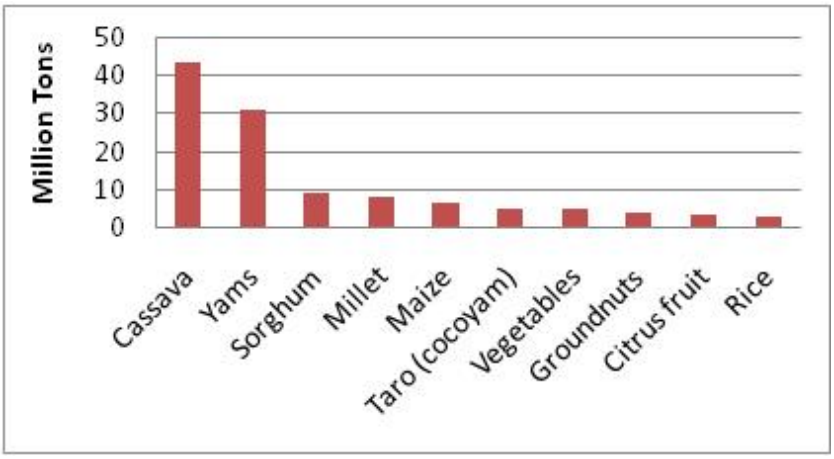
The world is developing an increased understanding of how the empowerment of women through projects that increase their social and economic standing also allows broader access to other fundamental human rights,

such as basic health and education. Instead of being seen as a burden, women are increasing being seen as having a value and benefit to their families and communities. At a personal level, empowerment gives women a chance to make their own choices, and the ability to seek new opportunities.

2 Market Analysis

Nigeria is agrarian, and agriculture remains the hub of the economy, providing employment for over 90 percent of rural workers, who constitute about 70 percent of the total population. More than 90 percent of the agricultural output is accounted for by small-scale farmers with less than 2 hectares under cropping. Cassava is Nigeria's largest agricultural crop, and as such, the economic fortunes of much of rural Nigeria are contingent upon the success of cassava production and processing. Cassava production has increased substantially over the past decade from 24 million tonnes in 1995 to over 45 million tons in 2007.

Figure 1: Nigerian agricultural production - 2007 (Source: FAO, 2007)



Throughout the entire cassava productive process, women typically carry out 70 percent of the work, including; planting, weeding, harvesting, transporting cassava, peeling, soaking, bagging and selling. Men carry out approximately 30 percent of the work; land preparation, harvesting, transporting and grating.

Cassava tubers deteriorate quickly after harvesting, and of the 45 million tons of cassava produced per year, 55 percent goes to waste due to inadequate processing capabilities. Less than one percent of total cassava production is processed commercially, primarily due to the high cost of transport and a lack of processing capacity.

Cassava can be processed into a number of derivatives, with cassava products constituting 53 percent of food consumed in Nigerian households. Gari, a roasted granule, is especially favored, as it can be consumed without additives or with simple additives like sugar, groundnut or fish. Gari is widely accepted in both rural and urban areas, and is the most important cassava derivative throughout much of Nigeria. However due to the ineffectiveness of traditional processing methods, resulting in inadequate supply, gari prices are being forced upwards, and gari is increasing being priced out of reach of poorer peoples, for whom gari is the main food staple.

The conversion of raw cassava into gari is a significant value-adding process. Based on historical data, the processing of cassava into gari increases the value per raw ton by between 200 - 400 percent.

Table 1: Pattern by Zone and Cassava Product (Source: IFAD, 2004)

Zone	**Order of importance**		
South West	Gari	Lafun	Fufu/Akpu
South South	Gari	Akpu	
South East	Gari	Fufu/Akpu	
North Central	Gari	Fufu/Akpu	Starch
North East	Fufu/Akpu	Gari	Abacha

Table 2: Average Prices 1993-2003 (Naira/ton of raw Cassava processed)

Year	Cassava	Gari	Ratio (Gari/Cassava)
1993	2,718.95	10,996.46	404%
1994	4,624.14	10,181.25	220%
1995	7,160.77	15,518.22	217%
1996	10,572.07	25,561.33	242%
1998	11,786.73	24,434.14	207%
2000	12,249.44	22,485.87	184%
2001	16,674.20	59,675.46	358%
2002	26,826.62	62,888.90	234%
2003	11,576.94	42,190.38	364%

Summary of market analysis:

- Cassava is Nigeria's largest agricultural crop
- Annual cassava crop of 45 million tones
- 55 percent of annual crop is wasted due to inadequate processing capabilities
- 70 percent of the labor requirements of Nigeria's cassava industry is fore filled by women
- Cassava and its derivatives account for 53% of Nigeria's food intake
- Gari is the most popular cassava derivative
- The processing of cassava to gari adds between 200 and 400 percent to the value of the raw cassava

In 2004, the International Fund for Agricultural Development (IFAD) identified regions within Nigeria suitable for increased cassava production, and industrialization of cassava processing. Selection criteria included

Table 3: IFAD site selection (IFAD,2004)

Production	Positive Indicator	Processing	Positive Indicator
Population Density	Low, Med Low	Cassava Root Price	$< 8,000$ (N/MT)
Village Density	Low	Gari Price	$< 20,000$ (N/MT)
Express Roads	Yes	Ratio: Maize/Cassava price	Low
Cassava Yields	> 12 tonnes/ha	Express Roads	Yes
Cassava Root Price	$< 8,000$ (N/MT)	Feed/Poultry Industries	Yes
Ratio: Maize/Cassava price	$< .8$	Flour/Bakeries Industries	Yes
		Starch/Textile Industries	Yes

population density, infrastructure, market prices, and associated industries. Of the 36 states analyzed, six areas were identified to have high potential for both increasing cassava production and processing. These states were; Kogi, Kwara, Edo, Ogun, Ondo and Oyo.

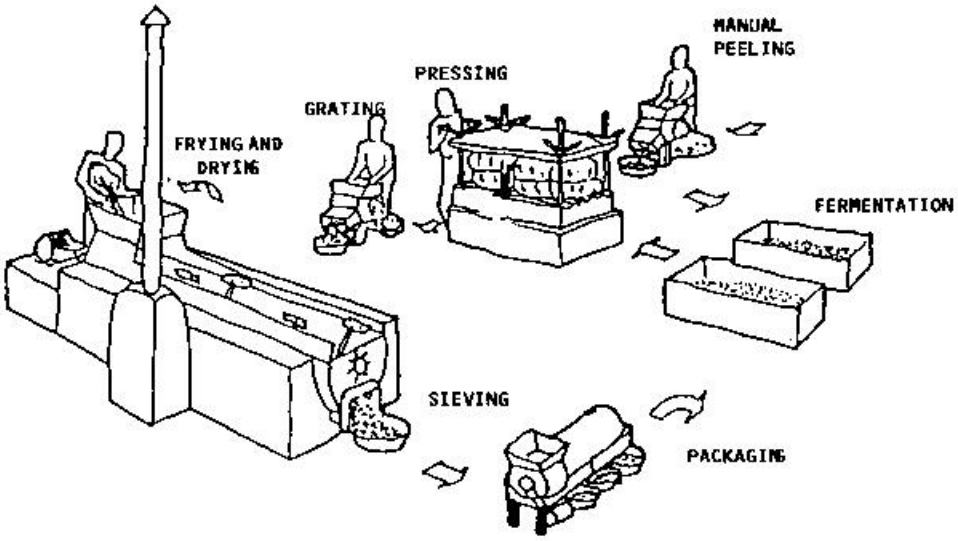
Ekpoma, in the Esan Central Local Government Area of Edo State, has the advantage of being a significant hub for the trade of gari. Merchants travel from the eastern parts of Nigeria to Esan in order to buy gari from the women that have processed it. There are approximately 700 women currently involved in cassava processing in Ekpoma.

3 Operations

Facility Introduction

In order to facilitate ease in producing large quantities of the various products from the cassava root, there is need for the creation of a facility that will dramatically increase production. As of right now, majority of the process of harvesting the cassava is done by hand. ECP will change that by creating a facility that incorporates machines that include; cassava peelers, cassava washing machines and fermentation vats, cassava presses, cassava graters, flash dryers to dry the cuttings, a cooking machine that will stir and cure the cassava cuttings, a bag stitching machine, and a diesel engine to run the machines. Also included in the facility will be a storage shed or silo that will be used to store the excess of processed cassava roots.

ECP seek to build a pilot plant in southern Nigeria in or near Ekpoma, about 80 miles northeast of Benin



City. Once ECP have chosen an appropriate site to build this facility, contact will be made with Ekpoma local government official Felix Akhabue and Chief Ayinmodu, President of the Nigeria Cassava Growers Association, in order to gain approval for the building of this facility. Once the facility is built, we shall hire a manager, an accountant, a warehouse keeper, and two security guards as non-technical staff. The rest of the workers will be women who already do the peeling and harvesting of the cassava root.

Marketing

The principal marketing scheme for this venture is rather simple and straightforward. ECP's marketing will primarily involve our facilities presence in the selected region, word-of-mouth and testimonials from users. The mere construction and presence of the cassava processing facility in the town of Ekpoma, will offer a great deal of marketing itself. By locating operations in Ekpoma the locals will see the facility and be inclined to inquire about it. From there, the benefits generated through the use of the facility can be translated and demonstrated. The word-of-mouth testimonials from growers will prove to be very beneficial, as the other growers will be more inclined to listen to their fellow societal members.

Although ECP will make initial entry by opening only a single facility, the market for cassava processing is not limited to just one region. It is anticipated that through the means of word-of-mouth and testimonials, fellow cassava producing regions will pursue an interest in our operations and push for us to expand our processes into their locales. This is a cheap, yet efficient method for ensuring our venture is relevant for the areas we later decide to expand into.

Human resources

Due to the fact that cassava needs to be processed quickly and efficiently for optimal quality, it is vital that ECP employs a technical staff that is both knowledgeable about cassava and skilled in the operation of the facilities processing machinery. These technical positions are the core of ECP's operations. Although the people native to the Ekpoma region may not initially be the ones operating the cassava processing facilities machinery, ECP hopes they can provide local knowledge and eventually learn how each machine functions, so the company can offer them employment. Each cassava-processing machine will require one skillfully trained individual for operation. The peeler and grater may possibly necessitate two persons for optimal operation. At the prevalent rate technical staff salary is about 40,000 naira or about 260 US dollars/week.

Additionally, ECP calls for human resources in a few non-technical but quit indispensable positions. A manager will be needed for the basic oversight of all operations. A warehouse keeper will head the day-to-day supervision of the facilities and its operations. Two full time security guards will be charged with the duty of ensuring no equipment is stolen or tampered with and the mitigation of any other unforeseen incidences involving individuals who are negatively affecting business operations. Lastly, an accountant is needed for financial bookkeeping. The salary for these positions is about 30, 000 naira or 200 US dollars per week.

4 Financial Analysis

Cassava garification involves 4 processing stages, from the peeling to the frying. The production facility has the equipment needed for each stage to process 1 ton of cassava per hour. Gari finished output accounts for 48 tons per week, 208 tons per month and 2496 tons in an annual basis.

MARKET ANALYSIS			
	Weekly	Monthly	Annually
Installed Capacity in Machine Hours	288	1248	14976
Average hours per ton	6	6	6
Tons produced from installed capacity	48	208	2496

Initial production volume in the first year is estimated to start at 80% of the installed capacity. Conservativly , an annual production growth rate of 4.6% is expected (which is the growth rate of cassava production; Agronomy Journal, 2010). Moreover, cassava producers' women from Edo state will increase their awareness of the project and potential benefits, triggering a boost in the service demand. The service fee would have a gross margin of 71% over the cost of the service. Such fee would have a steady increase of 2% so as to respond to inflation, wages adjustment and other economic variables potentially affecting the cost-earnings ratio. This fee is set at a level that will recoup set-up costs, allow for project sustainability and expansion.

SALES FORECAST					
	Year 1	Year 2	Year 3	Year 4	Year 5
Service demand growth	Year base: 80% installed capacity	4.60%	4.60%	4.6%	4.6%
Projected service demand (tons)	1996.80	2088.65	2184.73	2285.23	2390.35
Cost of service provided per ton (US$)	$ 58.09				
Rise in fee charged	Base year: Cost of service + profit margin	2.00%	2.00%	2.00%	2.00%
Fee charged per ton (in US$)	$ 203	$ 207	$ 212	$ 216	$ 220

GARIFICATION COST PER TON	
Labor Cost per ton	$ 56.25
Raw Material	N/A
Indirect Cost per Ton	$ 1.83
Service Cost per Ton	$ 58.09

Required investment is approximately US$57,000. 70% would be financed through a commercial bank loan, and the other 30% would represent investor's equity. The decision of financing the project mainly by liabilities was taken under the urgency and relevance of the project for the Edo community. Low dependency on private capital willing to undertake the investment, will avoid a delayed start.

INITIAL INVESTMENT	
Working Capital	$ 40,996
Assets (FF&E)	$ 16,000
Required Investment	$ 56,996
Liabilities	$ 39,897
Investors' equity	$ 17,099

A 5 year forecast is necessary to financially assess the project's evolution. For all the 5 years taken into consideration, ECP yields adequate positive net profits and free cash flows. 5% of annual earnings will be distributed to investors, and the rest will be reinvested with the aim to expand the facility size and scope. A more detailed explanation of financial statements and results for the forecasted years can be found in Annex 1.

	2011	2012	2013	2014	2015
ROI	3.47%	6.53%	9.94%	13.70%	17.85%

To conclude, the ECP project is financially viable for both Edo women and investors. The fee has the perfect combination between profitability (reflected in ROI) and convenience. An average fee of US$200 is very convenient for women cassava processors who receive approximately US$4000usd/T for the processed product. That small fee can boost their incomes by avoiding high wastage (50%), and several hours of intense hand labor, empowering them economically and socially.

5 Anex 1

SERVICE SUPPLY INCOME	2011	2012	2013	2014	2015
Total Demand of the service	1996.80	2088.65	2184.73	2285.23	2390.35
Fee charged	$203.30	$207.37	$211.51	$215.74	$220.06
Total sales of garification service	**$405,949.88**	**$433,116.05**	**$462,100.17**	**$493,023.92**	**$526,017.08**

COST OF SERVICE PROVIDED	2011	2012	2013	2014	2015
Labor Cost	$112,320.00	$112,320.00	$112,320.00	$112,320.00	$112,320.00
Indirect Costs	$3,665.68	$3,665.68	$3,665.68	$3,665.68	$3,665.68
Equipment depreciation	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00
Cost of service provided	**$117,485.68**	**$117,485.68**	**$117,485.68**	**$117,485.68**	**$117,485.68**

INCOME STATEMENT	2011	2012	2013	2014	2015
Sales	$405,949.88	$433,116.05	$462,100.17	$493,023.92	$526,017.08
Cost of service	$117,485.68	$117,485.68	$117,485.68	$117,485.68	$117,485.68
EBITDA	$288,464.20	$315,630.37	$344,614.49	$375,538.24	$408,531.40
Administrative Expenses					
Wages	$48,000.00	$48,000.00	$48,000.00	$48,000.00	$48,000.00
Fixtures Depreciation	$100.00	$100.00	$100.00	$100.00	$100.00
EBIT	$240,364.20	$267,530.37	$296,514.49	$327,438.24	$360,431.40
Loan Interests	$7,205.49	$7,205.49	$7,205.49	$7,205.49	$7,205.49
EBT	$233,158.71	$260,324.88	$289,309.00	$320,232.75	$353,225.91
Taxes	$69,947.61	$78,097.46	$86,792.70	$96,069.82	$105,967.77
Net Income	**$163,211.10**	**$182,227.41**	**$202,516.30**	**$224,162.92**	**$247,258.14**

CASH FLOW	Year 0	2011	2012	2013	2014	2015
INFLOWS						
Sales Income		$405,949.88	$433,116.05	$462,100.17	$493,023.92	$526,017.08
Investor's capital contribution	$17,098.93	$0.00	$0.00	$0.00	$0.00	$0.00
Loans received	$39,897.49	$0.00	$0.00	$0.00	$0.00	$0.00
Total inflows	$56,996.42	$405,949.88	$433,116.05	$462,100.17	$493,023.92	$526,017.08
OUTFLOWS						
Labor Cost		$112,320.00	$112,320.00	$112,320.00	$112,320.00	$112,320.00
Indirect costs		$3,665.68	$3,665.68	$3,665.68	$3,665.68	$3,665.68
Administrative Wages		$48,000.00	$48,000.00	$48,000.00	$48,000.00	$48,000.00
Loan Interests		$7,205.49	$7,205.49	$7,205.49	$7,205.49	$7,205.49
Principal payment		$0.00	$0.00	$0.00	$0.00	$0.00
Taxes		$69,947.61	$78,097.46	$86,792.70	$96,069.82	$105,967.77
Earnings distribution		$8,160.55	$9,111.37	$10,125.82	$11,208.15	$12,362.91
Equipment	$15,000.00					
Fixtures	$1,000.00					
Total Outflows	$16,000.00	$249,299.34	$258,400.00	$268,109.68	$278,469.14	$289,521.85
PERIOD CASH FLOW (C.F)	$40,996.42	$156,650.54	$174,716.04	$193,990.49	$214,554.78	$236,495.23
ACCUMULATED FREE C.F	$40,996.42	$197,646.96	$372,363.01	$566,353.50	$780,908.27	$1,017,403.50

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