

Cassava Postharvest System in Africa: yesterday, today, tomorrow

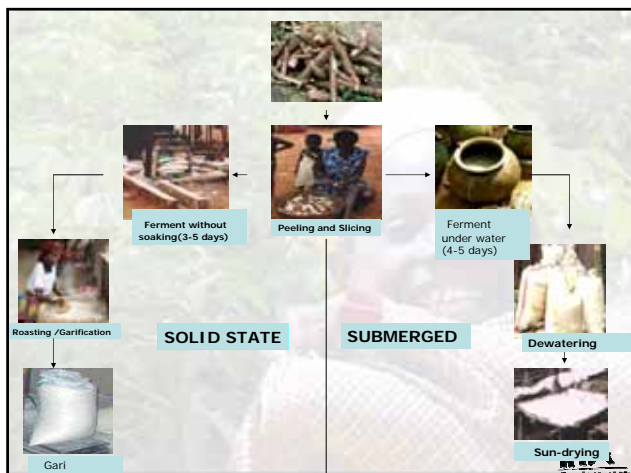
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14th ISTRC, CRTRI, Thiruvananthapuram, Kerala, India,
20-26 November 2006



Yesterday

- Cassava products were purely traditional
- low value
- poor quality
- poor storage methods
- restricted consumers
- No incentives



Today



Importance of value addition recognised in:

- Global Cassava Strategy (Rome 2000)
- FAO/GFAR Global Initiative on Postharvest Technology 2001
- Country Initiatives (2004...)
- NEPAD: Cassava-a powerful poverty fighter in Africa (2004..)
- The African Agricultural Technology Foundation (AATF)/ITA Ibadan 2005 strategic plan
- The UNIDO Abuja 2006 Master Plan: domestic, regional, and international market strategies for the cassava subsector
- IFAD's cassava processing and marketing regional initiative workshop, Accra declaration, March, 2006
- The Gates Foundation Cassava Initiative for SSA started in 2006



Research activities

- User friendly cassava varieties
- testing and adapting the use of the technologies in processing centers
- new cassava products
- Equipment development
- Good manufacturing, agricultural practices, and hygienic practices



The Cassava Plant: all is beautiful

Foliage:
"Tropical spinach and alfalfa"

Stems:
Planting material

Roots:
Unique starch properties
Low protein
Yellow roots: carotenes



Postharvest consideration

	Industrial	Food	Livestock	National selection	
Breeding	M98/0028	95/0288	97/2205	92B/00061	92/0326
For Industrial	TME419	92/0057	M98/0040	96/1632	92B/00068
Food	97/4763	96/1632	99/6012	97/2205	95/0289
Livestock	98/0505	TME419	98/0510	98/0505	97/3200
	M98/0040	98/0505	96/1565	TME 419	97/4763
	99/6012	97/2205	98/0505	91/02324	98/0510
	96/0523	98/0581	M98/0028	92/0057	98/0581
	8 92/0325	92/0326	TME419	M98/0068	
	97/2205	92B/00061	97/4763		
	98/0505	98/0510	98/0581		



Top 5 varieties released in 2005:
98/0505, TME 419, 97/2205, 98/0581, 98/0510

•Yield > 25 t/ha, DM >30%, CMD resistant



NRCRI, RTEP, FMARD, ADP,
Univ, Farmers, Industry



Gari

Gari is a favourite staple cassava products due to local preference



ITA

Micro processing centers

- Shed and equipment (grater, 2 pressers, 1 sifter, and 3 tray fryers)



Fairly large number
> 150 in Nigeria, Ghana,



ITA

Small-medium processing centers



About 40:
Nigeria
Ghana
Tanzania
Malawi
Madagascar



HQCF Business in Benin City
Employs 130 staff
Producing 20 tons HQCF daily

ITA

Instant fufu flour



Fufu flour in cartons
Displayed in Supermarkets



NAFDAC Number Obtained

About 5 in Nigeria



Widows mite Akwa-Ibom

ITA

Summary of number and type of enterprises supported by CEDP in the 11 States of South East/South-south, Nigeria, 2004 to date

Quarter	June 2004 - Sept 2005				Oct - Dec 2005				Jan - Mar 2006				Apr - Jun 2006				Jul - Sept 2006			
State	MPC	SME	MPCs	SMEs	MPC	SME	MPCs	SMEs	MPC	SME	MPCs	SMEs	MPC	SME	MPCs	SMEs	MPC	SME	MPCs	SMEs
Abia	7	1	5	1	12	1	10	18	2	20	24	8								
A Ibom	7	1	5	1	12	1	10	14	1	20	20	4								
Anambra	0	0	5	0	0	0	10	3	0	20	6	2								
Bayelsa	7	0	7	0	7	1	10	18	0	20	24	0								
C River	7	0	1	1	8	0	10	14	1	20	30	9								
Delta	6	1	5	0	6	1	10	11	1	20	26	2								
Ebonyi	0	0	5	0	0	0	10	3		20	6	0								
Edo	10	0	3	1	13	4	10	18	1	20	37	6								
Enugu	0	0	4	0	0	0	10	8	0	20	12	0								
Imo	5	0	0	0	5	0	10	8	0	20	15	0								
Rivers	13	0	0	2	13	3	10	9	3	20	9	3								
Total	62	3	40	5	82	5	110	124	9	220	209	34								

Source: IITA CEDP Annual Report submitted to USAID/SPDC

IITA

Large scale agroprocessing



Captain of Cassava Industry in Nigeria

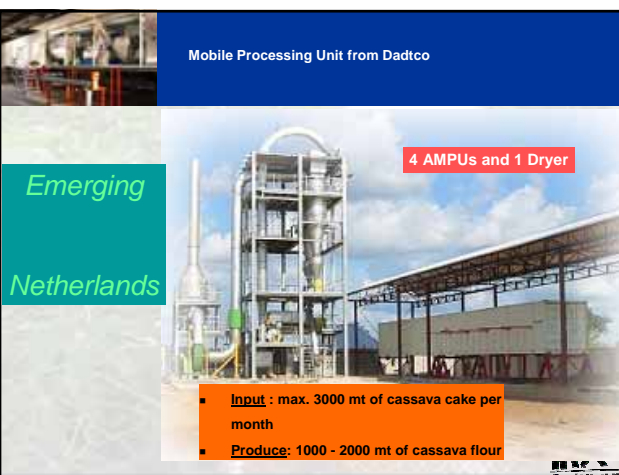
Courage, Innovation, Honesty, Transparent, Accountable, Skilful, gifted, thinkers, Investors



NSM-34 years of experience
Chris Okeke inherited his father's starch factory

IITA

Mobile Processing Unit from Dadtco



- Input : max. 3000 mt of cassava cake per month
- Produce: 1000 - 2000 mt of cassava flour

IITA

Brazilian automated Gari Plant

Cross River Rivers Delta




*Initiated (1986-89).
Abandoned (for about 15 years).
Reactivated*

*Transfer of Technology should be with caution
Public driven
Raw Material Supply
Human Resources
Running cost*

New Approach by Integrated Cassava Project



Product diversification




Captain of Cassava Initiative in Africa




→ President Olusegun Obasanjo
10% HQCF, E10 ethanol
IITA-CMD project



Launching of Cassava Standard Book




Functionality of Cassava Flour

Nationwide sensitization and training on utilization of 10% HQCF in bread



Ogun State



Cross river State



In collaboration with office of the Special Assistant to the President on Food Security, SON, NAFDAC, FIIRO, ADPs

28 States covered

Average participants=300 persons

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Products from HQCF



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Food-Based Approaches



Cassava-Plantain Bread

10% cassava-10% plantain flour-80% wheat flour

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Pictures in the Demonstration

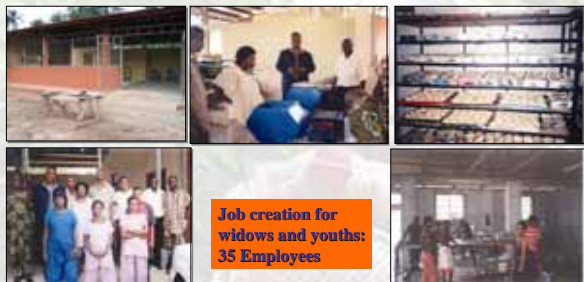


IITA/SEARNET, Malawi

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Bread from 10% HQCF

Widow's Mite-Akwa Ibom

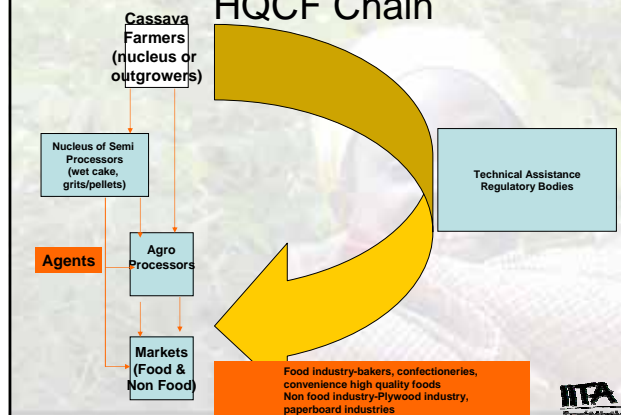


Job creation for
widows and youths:
35 Employees

IITA/CEDP, Nigeria



HQCF Chain



Use of HQCF

- Nigeria
- Ghana
- Malawi
- Cote d'Ivoire.
- Tanzania
- Uganda
- Côte d'Ivoire (Nestle Maggi factory)
- Senegal
- Democratic Republic of Congo
-stimulating demand in cassava production, creating jobs, and enhancing income to households.

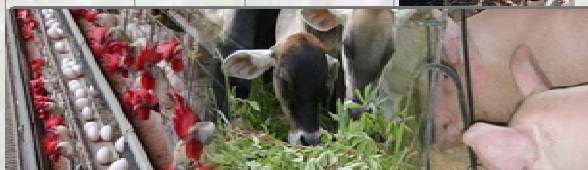


Cassava foliage



Use of cassava in animal feeding

Ingredient	Commercial	20 % cassava flour
Maize	41.10	23.0
Cassava flour	-----	20.0
Full fat soybean	20.0	20.0
Soybean cake	8.1	11.8
Rice flour	10.0	10.0
Wheat brand	9.1	3.6



Poultry trial

0% maize replacement
25% maize replacement
50% maize replacement
100% cassava



Growth performance
Egg production
Size of egg production
Are encouraging



Maize diet layed egg 17 week
Cassava diet layed egg 19 week
100 cassava layed egg 25th week

20/2/06: 102 laying eggs
24/2/06: 163 laying eggs

Poultry trial at IITA Onne

Functional



SPDC checked quality of eggs, yolk size and color, 12 June 2006

Fish (*C. gariepinus*) Trial

0% maize replacement
25% maize replacement
50% maize replacement
75% maize replacement
100% cassava



Others include:
Snail farming
Mushroom production from cassava peels
Grass cutter farming

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R&D in Glucose syrup production

- CEDP/UNAAB /SEDI produce glucose syrup from locally fabricated bioreactor (5L)
- Syrup used in soft drinks and confectionery industry-market potential in Nigeria
- Ready for scaling up



Ghana utilization of cassava for glucose syrup is gaining ground
Nigeria is already developing short time hydrolysing enzymes

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Waste for Glue



Some companies in the SADC (Malawi etc) region
and in Nigeria, Ghana are using cassava for plywood glues

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Quality Assurance System



IITA-NRI-UNAAB EU SME

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Equipment Development

IITA

Processing equipment fabrication



- Best bet machine fabricators
- produce appropriate of equipments for industry
- Flash Dryer, Peeler, Rotary Dryer???
- Solar panel dryer!!!
- Pelletizer!!!
- Team up to produce equipment of international standards
- R&D with IITA to strengthen local capacity

IITA

Peeler

A Major challenge



IITA-ARCEDEM



A & H Iwo



FUTA Akure



Faturoy Ibadan



PRODA Enugu



FUTO, Owerri

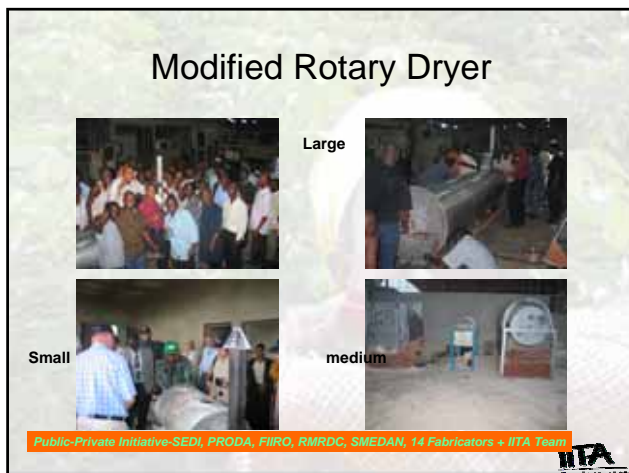
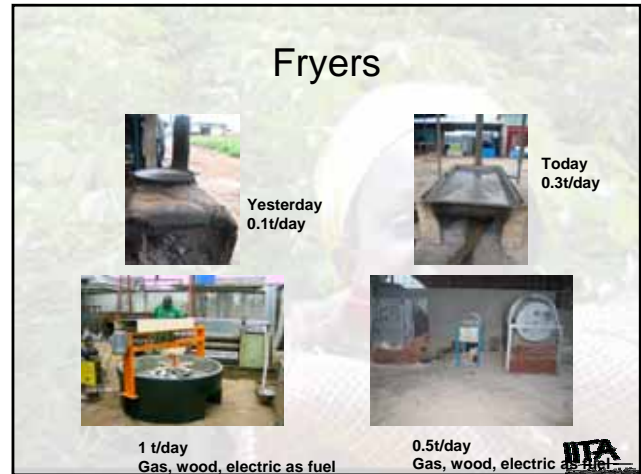
IITA

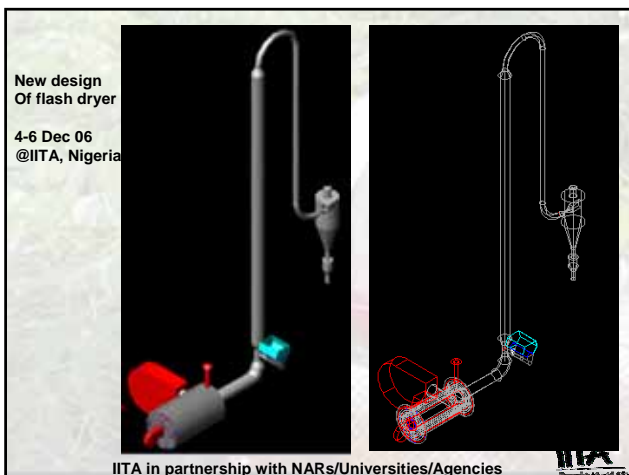
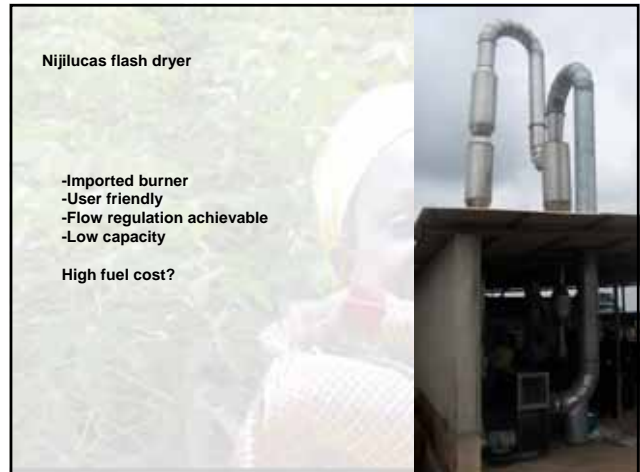
Mobile Grater



Add mobile Press after grating

IITA





Breeding for cassava end-user quality traits



Waxy Cassava

ITA

Cassava Ethanol & Biogas



Effluent

Ferment



Distil



Bagasse for Biogas @Mundo Verde

ITA

Gel fuel

Ethanol Gelfuel



super blue
Ethanol Fuel



Starch Modification

Crosslinked starch



Native cassava starch

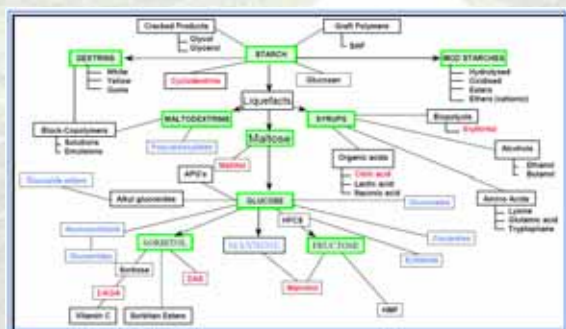


Crosslinked cassava starch

- Mostly in the form of distarch phosphate, Very important especially in food industry
- Starch becomes more resistant to processing conditions.

ITA

Other Starch Opportunities - Value Addition



Future Challenges



- Product Diversification
- Vertical Integration
- Public-private partnerships
- Viable environment (energy, road..)
- Producer associations
- Capacity building
- Need More Champions



The Global Cassava Development Strategy Vision

- *Cassava will spur rural industrial development and raise incomes for producers, processors and traders.*
- *Cassava will contribute to the food security status of its producing and consuming households*

