

Additional Funding Program Description

**CASSAVA ENTERPRISE DEVELOPMENT PROJECT
(CEDP)**

submitted to the

United States Agency for International Development (USAID) -Nigeria
Mission

and the

Shell Petroleum Development Company (SPDC) - Nigeria

by the

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1. Executive Summary

After decades of military rule, corruption and over-reliance on oil revenues, Nigeria has consolidated its democratic transition through its recent presidential election. The major challenge now facing the most populous nation in sub-Saharan Africa is to revitalize its economy and improve the livelihoods of its citizens, two-thirds of whom are poor. A key to Nigeria's economic growth is through private sector investment and trade in the agriculture sector, which comprises 40 percent of the GDP, and which is the largest employer of labor. However, agricultural productivity is stagnant, improved technologies and inputs are not accessible, and market linkages are weak, resulting in high post-harvest losses and very little value-added processing. Nigeria has many factors, which favor the development of its agriculture sector, including suitable climate, soils and a large domestic market.

One of the most important crops for Nigerian farmers is cassava; it is the most widely cultivated crop and provides food and income to over 30 million farmers and large numbers of processors and traders. It is an important regional food source for 200 million people – nearly one-third of the population of sub-Saharan Africa. However, cassava is threatened by the Cassava Mosaic Disease (CMD), which devastated crops in Uganda in the late 1980s. By 1999, CMD became a pandemic in East and Central Africa where it caused up to 100 percent loss of the crop. In Nigeria, CMD poses a serious threat and the most vulnerable areas are the south-south and south-east states including the Niger Delta Region. While cassava is mainly used for food, there also exist significant opportunities to enhance the marketing opportunities for cassava products.

In order to assist Nigeria to revitalize its agricultural economy, USAID/Nigeria and SPDC in association with the International Institute of Tropical Agriculture (IITA) proposes to support an integrated \$11.3 million, 5-year activity to develop the cassava sector through a public-private partnership with key stakeholders. This activity, to be known as the "Cassava Enterprise Development Project" or "CEDP", will be implemented through IITA in support of Nigeria's Presidential Cassava Initiative, and will complement and be linked with a \$17.1 million, 4-year public-private partnership including the Federal Government of Nigeria (FGN), Niger Delta Development Commission (NDDC), IFAD, private sector and others to develop the cassava sector. Only \$4.1 million out of the \$17.1 million have been provided by FGN and NDDC so far.

The CEDP addresses the critical threat of an outbreak of CMD to Nigeria and West Africa, while developing processing and marketing outlets for cassava products. The threat of CMD is hard to over-estimate. If unchecked, CMD could result in a potential food security crisis with major social impacts throughout the region. It will also undermine the potential to develop markets for cassava in livestock feed, ethanol, starch and other industries. Working with a wide range of stakeholders and through existing national structures and organizations in the country, the project will integrate cassava production and plant protection, post-harvest storage and processing options and good marketing outlets and strategies to drive agricultural intensification, diversification and commercialization in line with national food security needs and poverty alleviation. Specifically, the project will:

- 1) Reduce the impact of the Cassava Mosaic Disease in selected communities in the south-south and south-east states of Nigeria;
- 2) Increase the productivity of cassava; and;
- 3) Develop and expand post-harvest processing and marketing outlets for cassava products.

For all the desired objectives, strengthening human and institutional capacity of producers, processors, commodity traders, fabricators etc to produce, process and market cassava efficiently as well as increasing private sector investment in production, processing, storage and marketing, will be fundamental tasks.

The potential for cassava sector development is based on the success of a number of activities supported by USAID/Nigeria as well as a critical analysis¹ which estimates a potential return of over \$500 million per year in the sector. Cassava roots are grown by 30 million farmers in Nigeria, and are an important food source for an estimated 200 million people or about one-third of the population of sub-Saharan Africa.² It is therefore imperative that the CMD threat be contained in Nigeria and not spread throughout West Africa. Through an integrated commodity development approach, there is a significant potential to improve food security, increase rural incomes and increase productivity of this critical crop.

The project's implementation strategy will emphasize private sector participation with a focus on downstream partners; technical, social and financial empowerment of local communities and stakeholder ownership to enable producer groups, women and unemployed youth to make informed-decisions on production and income generating activities; and institutional support to provide the human resources and infrastructural support base required for sustainability of the project.

Summary of project objectives

Project Goal

Diversify and strengthen rural economy in selected geo-political zones using cassava as the engine for growth.

Project Purpose

Increase economic opportunities through sustainable and competitive cassava production, marketing and agro-enterprise development in selected communities of the 11 states of the South-East and the South-South geopolitical zones including the Niger Delta region.

Objectives

1. To mitigate the impact of Cassava Mosaic Disease and prevent its spread throughout Nigeria and West Africa through diversification, participatory evaluation, multiplication and distribution of CMD-resistant germplasm to farmers;
2. To increase cassava productivity through deployment and promotion of improved germplasm, soil amendments, integrated pest management options and other proven 'best bet' practices);
3. Develop and expand post-harvest processing and storage, and marketing outlets for cassava products to increase incomes and improve livelihoods in rural areas.

For all the desired objectives, strengthening human and institutional capacity of producers, processors, commodity traders, fabricators etc to produce, process and market cassava efficiently as well as increased private sector investment in production, processing, storage and marketing will be fundamental tasks.

Expected Results

1. Impact of the Cassava Mosaic Disease (CMD) reduced through diversification, participatory evaluation, multiplication and distribution of CMD-resistant germplasm to farmers.

¹ IITA, *et al.* 2003. Assessment of the Nigerian Agricultural Policy. IITA, University of Ibadan, IFPRI. May, 2003 (draft).

² Manyong *et al.* 2000. Contribution of IITA-improved cassava varieties to food security in sub-Saharan Africa: an impact study. IITA.

2. Productivity of cassava increased through the generation, promotion and adoption of demand driven, competitive and sustainable cassava production.
3. Post-harvest processing and storage, and marketing outlets for cassava products developed and expanded.

Time frame

Five years beginning in 2004

Budget

US \$ 11.7 million (\$7.5 million from SPDC, \$2.9 million from USAID and \$ 1.3 million from IITA over a period of 5 years).

Project Operational States

The CEDP for the SPDC – USAID partnership will focus on selected communities of the 11 states of the South-East and the South-South geopolitical zones including the Niger Delta region, an especially impoverished area of Nigeria. While all project activities will be carried out in core states of SPDC and USAID, which include Abia, Akwa Ibom, Bayelsa, Cross River, Delta, and Rivers States, some project activities (e.g. mitigation of the impact of the cassava mosaic disease, increasing the productivity of cassava) will be carried out in the remaining states (Anambra, Ebonyi, Edo, Enugu and Imo States). Specific project activities will initially focus on a selected number of sites in order to develop cassava clusters based on the following criteria: current cassava production and production potential, land availability, presence of alternative crops, rural infrastructure, existing or proposed agro-industry, existing support schemes for cassava, leveraging of funds from State government/private sector. Possible local partners will be identified during needs assessments studies and project planning.

USAID and SPDC Strategic Focus and IITA’s Mission

The CEDP will support the USAID-Nigeria Mission’s proposed Strategic Objective (SO) 12 “Improved Livelihoods in Selected Areas”. This SO is linked to support the U.S. Presidential Initiative to End Hunger in Africa with indicators that will measure increased productivity; increased rural income; and, increased food availability. The SO 12 intermediate results are: (1) improved productivity of selected commodities and products; (2) increased value-added enterprise development; (3) increased commercialization of selected commodities and products; and 4) Mitigating the impact of CMD disease.

In recognition that a sustainable strategy would be required to break the cycle of poverty, eliminate unemployment and dependency syndrome, as well as the militancy and political conflict in the Niger Delta, SPDC has developed a sustainable community interface management strategy which is aimed at improving family and community welfare, reducing the level of poverty, and enhancing local productivity in the SPDC operational zone in the Niger Delta Region. Within a strong public-private partnership with Shell and IITA in providing financial resources and political support that are required for success and sustainability, the CEDP will support this new focus of the company to attain its strategic objective for the Niger Delta region of Nigeria to improve the communities in their operational zone to enhance employment, productivity, and income through the enterprise development and commercialization of the cassava sub sector.

A part of the worldwide consortium of 16 centers co-sponsored by the World Bank, the Food and Agriculture Organization of the United Nations, the United Nations Development Program, and the International Fund for Agricultural Development, IITA’s mission is to increase food production in tropical Africa, and ultimately to raise the productivity and income of small-scale farmers in an ecologically sustainable way, in partnership with national and international stakeholders.

Beneficiaries

It is anticipated that about 300,000 farm families will benefit from this program. The primary beneficiaries are resource-poor farmers/producer groups, most of them women, who will benefit from increased capacity to manage their production systems for higher and stable productivity and profitability, increased availability of a range of marketable cassava products, creation of local employment opportunities reducing exodus of young people to urban areas, improved rural and urban food security and livelihood, and foster healthy production environments.

Secondary beneficiaries include small-and-medium-scale processors, fabricators, commodity traders, consumers, private sector agribusiness entrepreneurs involved in cassava production, processing, handling, marketing, and consumption in the cassava subsector who will benefit through increased cassava availability, demand and commercialization. National agricultural research and extension systems (NARES) will benefit from international collaboration, training and exchange of information and genetic resources. National governments will benefit from domestically available raw materials for food, feed, and industry.

2. Background and Justification

Nigeria has substantial economic potential in its agricultural sector. However, despite the importance of agriculture in terms of employment creation, its potential for contributing to economic growth is far from being fully exploited. It has been observed that the sector's importance has fluctuated with the rise and fall in oil revenue. Over the past ten years, the Nigerian agricultural sector has remained stagnant while the contribution of the manufacturing sector to the GDP had declined over the same period. Inappropriate macro-economic and sector policies perpetuated by the 15 years of military rule and mismanagement have had a negative impact not only on agriculture, but also on the entire economy. Consequently, per capita incomes have declined from approximately \$1200 in the 1980s to about \$300 in 1999 (World Bank 2000). In addition, Nigeria's social indicators have fallen well below the average for all developing countries. For instance 70% of the population are below the \$1/day poverty line (World Bank 2000). Life expectancy is only 53 years (ADB, 1999), and infant mortality rate is as high as 74 per 1,000 live births with adult literacy also low at only 43% (ADB, 1999).

Following the democratic elections in 1999 major investment opportunities have been identified and various presidential initiatives³ to bolster development of the agricultural sector have been put in place. In addition, the present government has pledged to accord the agricultural sector the highest importance during the next 4 years (Obasanjo, May 29, 2003). However, as a result of the considerable magnitude of poverty in the country, particularly in the rural areas, this has raised expectations for quick improvements in the livelihoods of the general populace. Data from the Federal Office for Statistics (FOS, 1999) indicate that poverty levels in the country have been on the increase since 1986. Detailed analysis of the poverty situation in Nigeria revealed that most of the poor work in the agricultural sector and most reside in rural areas. Studies in Nigeria (D'Situa, 1994) and elsewhere (World Bank, 2000), have traced an evident linkage between poverty and agricultural sector performance. Therefore, improvements in performance of the agricultural sector can have far-reaching beneficial implications for food security, income generation and poverty reduction.

Although efforts at political level have been intensified to increase the agricultural sector's contribution to economic growth, there has been no significant impact on employment creation, and improvements in rural incomes. This is because growth in agriculture has been incapacitated by lack of adequate agro-industries to spur demand for agricultural raw materials. While various programs have been designed to achieve sustainable agricultural growth, they have mainly focused largely on increasing farm productivity through the maximization of agronomic efficiency. Through the efforts by various agricultural research institutes, technologies for transforming smallholder agriculture have been developed for production through post harvest, but adoption of these remain low. Also, efforts to promote commercialization and agro-enterprise development have not received adequate attention.

In general, the type of agricultural system, (crop or livestock production) as well as level of intensification are influenced by the agro-ecological zone (AEZ) in which agricultural activities are carried out. According to classifications provided by IITA, Nigeria has six major agro-ecological zones that run transversely from west to east. The zones are *the humid forest* (mainly in the south), *the derived/coast savanna and the southern Guinea savanna* (part of the south and the entire middle belt), *the northern Guinea savanna*, *the mid-altitude savanna*, and *the dry Sudan/Sahel savanna all in northern parts of the country*. The Guinea savanna AEZs are noted for producing livestock (cattle, sheep, goats and chicken) and the following major crops: cotton, groundnuts, maize, millet, sorghum, soybeans, yam, cassava and vegetables (tomatoes,

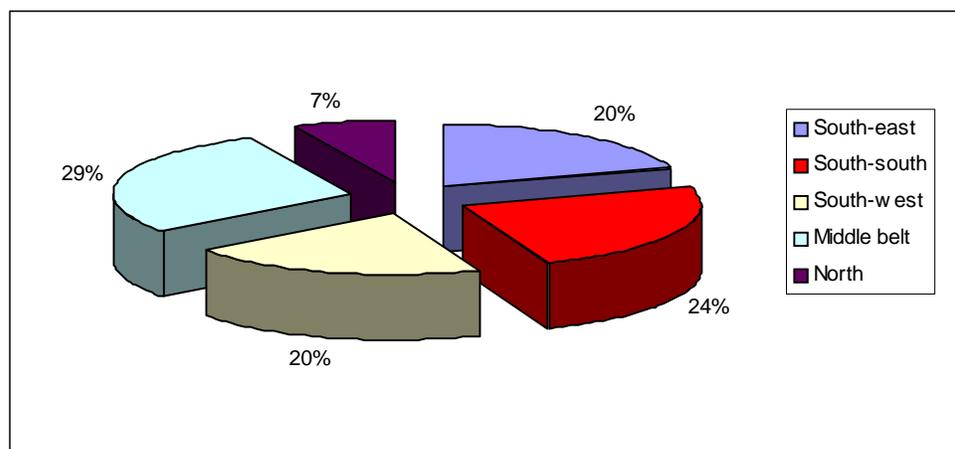
³ The following major Presidential Initiatives have been proclaimed: cassava; rice; vegetable oils; livestock; and tree crops.

carrots, lettuce, onions, and pepper). The humid forest, derived, and coastal agro-ecological zones are noted for producing tree-crops (cocoa, oil palm, rubber and timber), and food crops (cassava, yam, maize, pineapple, bananas, plantains, papaya, mango, orange, yam beans, and vegetables (fluted pumpkin, okra, tomato, and pepper). Livestock production (small ruminants and poultry keeping) is also practiced in the southern zones. Among the crops cultivated in the south, cassava is the most widely cultivated, both as food and cash crop.

An assessment of Nigeria’s agricultural sector (IITA *et al.* 2003) conducted by a consortium of scientists from IITA, the University of Ibadan and IFPRI classified major constraints in the Nigeria agriculture sector as technical, resource, socio-economic and organizational. These constraints function along the entire production to consumption chain, with marketing of farm products usually cited by farmers as a major constraint to commercialization

Cassava in the Nigerian economy

Nigeria is the largest producer of cassava in the world. Its production is currently put at about 33.8 million metric tons a year (FAO 2002). Total area harvested of the crop in 2001 was 3.1 million hectares with an average yield of about 11 tons per hectare. Cassava plays a vital role in the food security of the rural economy because of its capacity to yield under marginal soil conditions and its tolerance of drought. Cassava is the most widely cultivated crop in the country. The contribution of cassava production by geo-political zones in Nigeria is presented in Figure 1. In total, the southern states account for 64% of the cassava produced in Nigeria. It provides the livelihood for over 30 million farmers and countless processors and traders.



Based on CAYS data from FMARD, 2002

Figure 1 Cassava production (%) by zone in Nigeria, 2001

Nweke *et al.* (2002) maintain that Nigeria is the most advanced of the African countries poised to diversify the use of cassava as a primary industrial raw material and livestock feed. Two factors put Nigeria to this comparative advantage in Africa: one is the rapid adoption of improved cassava varieties and the second is the development of small scale processing technologies including the cassava grater. Cassava performs five main roles namely: famine reserve crop, rural food staple, cash crop for urban consumption, industrial raw material, and earner of foreign exchange (Nweke *et al.* 2002).

Among the crops widely cultivated in southern Nigeria, research efforts have made the greatest impact on cassava. Production has increased substantially in the country over the last twenty years, principally owing

to an increase in the area cultivated and improvements in production efficiency through the introduction of high yielding, disease and pest resistant cultivars (Figure 2). Despite this development, demand for cassava is mainly for food and the absence of agro-industrial markets remains the major constraint to further development of the crop. Cassava production exhibits high levels of variability and cyclical gluts due mainly to the inability of markets to absorb supplies. As a result, prices of root and tubers decline sharply and production levels are reduced in succeeding years before picking up again. Such factors cause price instability over the years, which significantly increase the income risk to producers. Insufficient processing options for roots and tubers, inadequate marketing channels, and lack of linkages between producers and the end-users are major factors preventing greater profitability for producers and processors. There is a potential to generate from one crop multiple economic benefits through improved post-harvest handling and processing of fresh root and tubers.

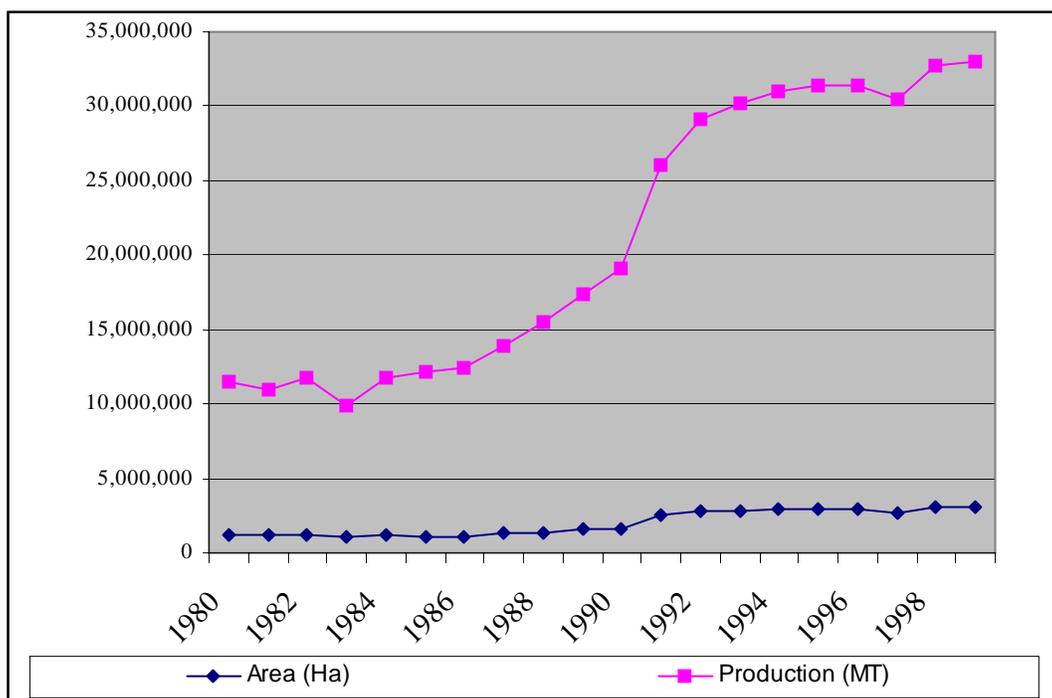


Figure 2 Cassava production and area trend in Nigeria

Cassava as food security crop

Cassava has long been used as a famine reserve and food security crop produced mainly through smallholder subsistence farming systems. Low input use, rudimentary technology, large post-harvest losses and minimal processing characterize these farmers. Small-scale cassava producers (cultivating <2 ha) constitute about (95%), while those with more than 5 ha constitute about 5%. Although cassava is widely consumed in Nigeria, prospects for expanding demand as food will only come from population increase. Income elasticity estimates based on household food consumption and expenditure survey showed that there is less possibility to expand demand among urban households particularly for its main consumed forms gari, and fufu (Kormawa, *et al.* 2002). Thus, taking price and non-price factors into consideration, the prospects for expanding domestic cassava market for food in the form of fresh cassava or gari is limited. These results suggest that efforts to expand the domestic market for cassava should not focus on fresh cassava, gari or similar products, but rather in new products development. Unless new products that

are more acceptable to consumers are developed, future efforts to expand cassava market should look outside the traditional food sector.

Gender and cassava

Cassava provides different opportunities for both men and women farmers and processors. A study by Nweke *et al.* 2002 identified five important gender relevant issues related to cassava. For instance, both men and women make significant contributions of their labor to the cassava industry, with each specializing in different tasks; men work predominantly on land clearing, ploughing and planting, while women specialize in weeding, harvesting, transporting and processing. Secondly, both men and women play strategic, but changing roles in the cassava transformation process. Thirdly, as cassava becomes a cash crop, men increase their labor contribution to each of the production and processing tasks. The introduction of labor saving technologies in cassava production and processing has led to a redefinition of gender roles in the cassava food systems. Finally, women who want to plant cassava are usually constrained by the lack of access to new cassava production technologies and other resources. A recent study on gender and cassava commercialization in Nigeria showed that as cassava is commercialized, households in cassava producing areas invest more on the education of their children (Kormawa and Asumugha, 2003).

While the sexes are equally represented in trading, women, and to a lesser extent children, dominate in processing. As opportunities for commercialization increase (arising from favorable market opportunities for cassava and its products), the number of women involved in processing increases. Growth in cassava production is therefore likely to provide increased employment opportunities for women. However, there is a tendency that as mechanized processing equipment (such as graters and mills) are acquired, the involvement of men in cassava processing tends to increase, as they often control and operate these machines (Spencer and Associates 1997). Women may therefore lose some of the benefits of increased employment, as they lose control of some of the income. Steps need to be taken to ensure that this does not happen, e.g. by assisting women to get organized into groups that can effectively carry out the commercialization of the commodity; increasing the access of such organized women groups to credit for acquisition of postharvest machinery, and training them to properly operate the equipment, enhance their postharvest and microenterprise skills. This means that the needs of women should be kept in mind even at the project design and implementation stages to prevent any possible negative impacts of increased commercialization in the sector, e.g. the equipment design and dissemination stages.

3. Challenges and Opportunities

1. Pests and diseases

Various diseases and insect pests plague cassava causing economic losses. These include the cassava mosaic disease (CMD), cassava bacterial blight (CBB), cassava mealybug, green spider mite (GSM), and the large grain borer, which attacks dry chips of cassava in storage. Others are termites, anthracnose, root rot, rodents, and stem girdlers. Cassava mealy bug and GSM have been largely controlled through Africa-wide biological control efforts of IITA and its partners. White ants (termites) destroy stems that are planted before they sprout. Some areas appear to be very prone to this problem. Various chemical control measures are recommended, but the need for safe use and high costs restricts their use among many small farmers who practice mixed cropping. Also the menace of rodents is a regular occurrence in the field. Root yield losses due to cassava mosaic disease are as high as 70% on susceptible genotypes in Nigeria. The production loss due to CMD in Nigeria has been more realistically estimated at 6.78-9.69 million tons in 1998 when the total harvest for the country was 33.56 million tons (Echendu *et al.* 2003). This translates to nearly US\$ 65 million direct loss to the Nigerian economy. If indirect losses are considered, the damage to the economy would be even higher. Similarly, CBB has been reported to cause 13-50% losses in tuber yield in Nigeria.

The cassava mosaic disease pandemic

An emerging threat to cassava production in Nigeria is the incidence of the Cassava Mosaic Disease (CMD). Whilst CMD routinely reduced cassava production by 15-25% across sub-Saharan Africa, scientists did not really *get al.* armed about its potential impact until late 1980s when the first news began to trickle in of a devastating epidemic of the disease in north-central Uganda. By 1999, a pandemic of an unusually severe form of CMD had expanded to cover more than 750,000 km² of East and Central Africa (Figure 3). The effects of the pandemic have been devastating; with up to 100% yield loss both in terms of the storage roots and leaves, resulting in farmers typically abandoning cassava production (Harrison *et al.* 1997; Otim-Nape *et al.* 1997). In Uganda alone, an estimated production loss of 600000 tons amounting to US\$60 million annually, triggered large-scale famine and death of 3000 people. East Africa region-wide losses have been estimated to be in excess of US\$100 million annually. The virus causing the pandemic has been identified as a novel type and a recombinant form of the East African cassava mosaic virus (EACMV) and African cassava mosaic virus (ACMV), designated as a variant of EACMV in Uganda (EACMV-Ug) (Harrison *et al.* 1997).

The pandemic continues to expand. More recently, Democratic Republic of Congo, and Republic of Congo (Brazzaville) and Gabon have been affected. There are also reports of increasing severity of CMD in Central Africa Republic, Cameroon, and Equatorial Guinea.

Recently, mixed infections of ACMV and EACMV, the two viruses which gave rise to the EACMV-Ug, have been reported in Cameroon, Nigeria, Ghana and Togo (Fondong, *et al.* 1998; Fondong *et al.* 2000; Offei *et al.* 1999; Ogbe 2001; Ogbe, *et al.* 1999; Ogbe *et al.* 2003). A recent diagnostic survey to monitor changes and spread of CMD showed that the mixed infections of the two viruses is now widespread in the south-south and south-east zones of Nigeria (Figure 4) and have increased in incidence from 18% in 1998 to 48% in 2003, implying that there is increase in the chances of getting a recombinant hybrid strain that may be as virulent as the Ugandan strain. The survey already showed that virulent strains of ACMV and EACMV inducing very severe symptoms are already present in the surveyed zones. In addition, a small population of unidentified seemingly virulent strains/species of cassava mosaic viruses was also found in the surveyed zones. The complex situation of cassava mosaic *begomoviruses* in the survey area suggests possible occurrence of a Nigerian strain that may deserve equal attention as the Ugandan strain.

The occurrence of ACMV, EACMV and their variants in mixed infections in Nigeria, the severe symptoms that characterize such mixed infections and the possible spread of the virulent Ugandan variant (EACMV-Ug) to Nigeria pose a serious threat to the food security situation of the world's largest cassava producing nation if immediate action is not taken. The most vulnerable areas are the south-south and south-eastern states of Nigeria including the Niger Delta Region where the population of more than 29 million people (2002 projections) depends predominantly on cassava for their subsistence, and where chronic food shortages and widespread poverty and unemployment are recurrent causes of social disturbances. In view of the current importance of cassava in Nigeria, coupled with its potential to serve as an engine for future agricultural development, threats to production must be considered very seriously. It is within this framework, that the current threat to cassava production posed by CMD must be considered. In fact, the Chairman of Nigeria's ruling Peoples Democratic Party referred to CMD as one of the greatest threats to the country's democracy⁴.

⁴ Speech presented by the National Chair of Nigeria's ruling Peoples Democratic Part (Chief Audu Ogbe), representing the President and Commander-in-Chief of the Federal Republic of Nigeria, Chief Olusegun Obasanjo, at a one-day senior executive briefing meeting on the "Pre-emptive management of cassava mosaic disease" attended by a wide range of key cassava stakeholders at the High Rainfall Onne Station, Rivers State, 10 October 2002.

Without preemptive measures to contain the virulent form of the cassava mosaic disease the estimated loss to the cassava industry in Nigeria would amount to ₦36 billion at 2001 production levels (RUSEP, 2003). The collapse of the cassava industry would also lead to loss of jobs in the rural areas, the processing and machine fabrication industry, and decimation of urban and rural food security. This may eventually lead to food unrest, loss of confidence in government, and pressure on government to import food. If CMD is not controlled in Nigeria, it will spread throughout West Africa.

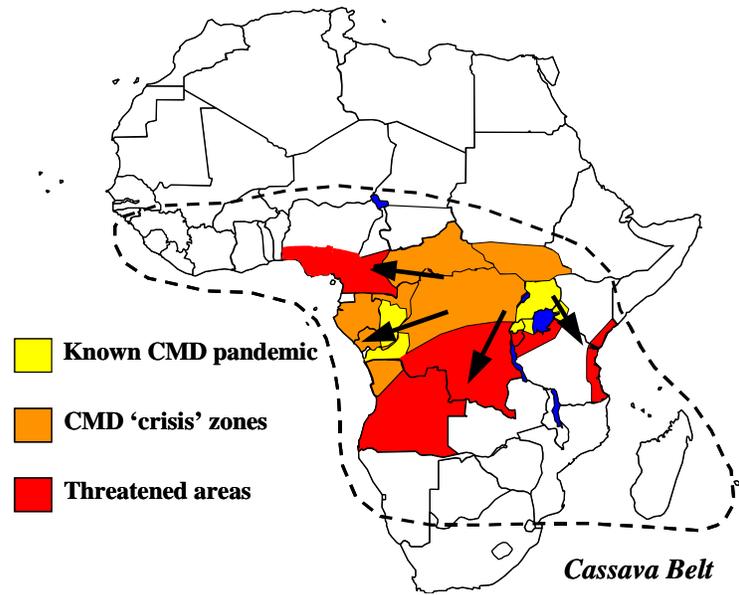


Figure 3 Continental spread of virulent Ugandan variant of East African cassava mosaic virus (EACMV-Ug)

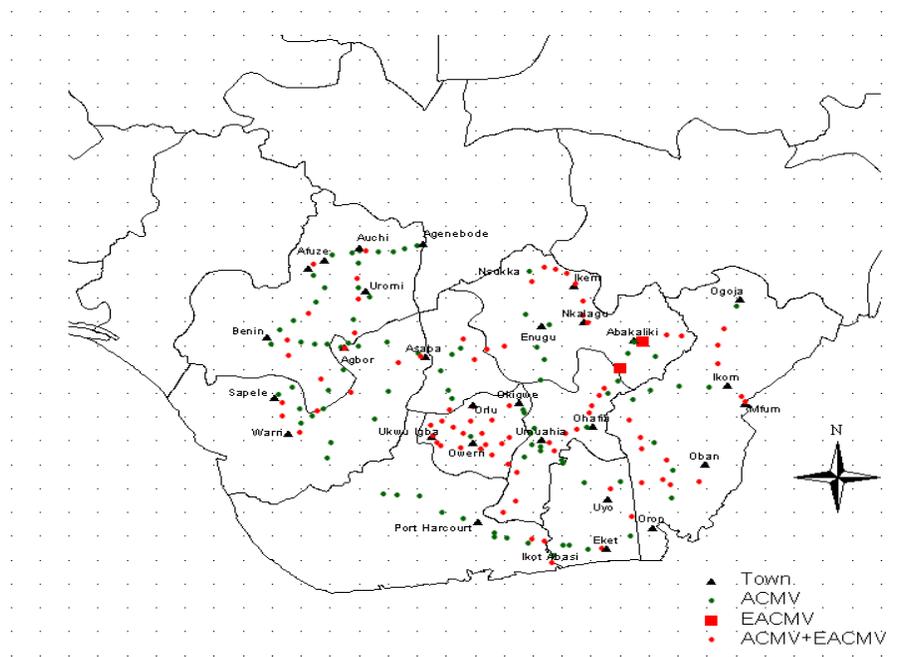


Figure 4 African cassava mosaic virus (ACMV) and East African cassava mosaic virus (EACMV) distribution in the survey areas: south-south and south-east states of Nigeria (2002/2003)

Tackling the cassava mosaic disease pandemic

The first successes in tackling this problem in Uganda were based on gathering baseline information to establish which areas were most affected, how fast the disease was spreading, and which areas were immediately threatened. This was followed by the development, multiplication, and distribution of diverse CMD-resistant varieties to farmers, in close collaboration with the Ugandan national research system and other partners, including IITA, and development investors. As part of this emergency effort, the pandemic was also monitored in East and Central Africa, and CMD-resistant variety multiplication centers were established at strategic locations and in the most recently affected areas for distribution to farmers. A massive boost in germplasm diversity was also provided through innovative germplasm exchange mechanisms, and agricultural workers and farmers were trained in a wide range of cassava cultivation skills.

In addressing what had become a “pandemic” in East and Central Africa, IITA took the initiative to set up a regional program at its East and Southern Africa Regional Center (ESARC), Uganda, for the management of the disease outbreak in East Africa, IITA has coordinated CMD management programs from its headquarters at Ibadan in Nigeria and its Eastern and Southern Africa Regional Center in Kampala, Uganda. With support from USAID, Danish International Development Agency (DANIDA), the Department for International Development of the United Kingdom (DFID), The Gatsby Charitable Foundation, and the Rockefeller Foundation, together with the regional research networks, East Africa Root Crop Research Network (EARRNET) and Southern Africa Root Crop Research Network (SARRNET), a network of partners was established and a multifaceted emergency program launched. Key components to this sustainable approach included the deployment of elite germplasm, phytosanitation, biological control, cultural practices, and soil fertility management. These were integrated and tested with farmers using participatory methods in strategically located technology transfer centers (TTC). The capacity of farmers to optimally manage pest, disease, and soil fertility constraints in their cassava fields was strengthened through in situ field-based training activities. In order to tie sustainable production increases with enhanced income generation opportunities, links were proactively developed among TTCs and identified markets for a range of fresh and processed products to enable stakeholders capitalize on the developments in processing and marketing technologies.

A major breakthrough in IITA’s breeding program was the pyramiding of five new gene sources of CMD resistance identified from West African landraces of cassava, with the resistance genes of the earlier Tropical *Manihot* Selection (TMS) varieties, providing greater and more durable resistance. The ‘new generation’ of cassava germplasm developed combines enhanced CMD resistance with improved post harvest qualities, multiple pest/disease resistance, wide agro-ecological adaptation and greatly improved yield potential. The characteristics of the new genotypes also reflect the vision of an expanded future role of cassava in the food, feed and industrial applications.

In the case of Nigeria, over diverse CMD-resistant varieties have been selected from this stock for widespread deployment. In order to get these materials into farmers fields as quickly as possible, a novel fast-track varietal testing approach is proposed and piloted, in which new clones are rapidly multiplied on station, then taken straight for simultaneous multilocational evaluation on station and participatory evaluation in farmers’ fields, and followed by large-scale and sustainable multiplication and distribution of certified cassava planting materials to farmers in the major producing states in Nigeria.

Impact of the cassava mosaic disease management

The total benefits, using the Dynamic Research Evaluation for Management (DREAM) impact model version 3.0 of the International Food Policy Research Institute, for one of Uganda's CMD-resistant cassava multiplication project (ACDI/VOCA, Public Law 480 programs (PL480), a partnership project between the National Agricultural Research Organization (NARO, Uganda) and IITA, to combat the cassava mosaic disease pandemic in six districts [of Uganda](#) were approximately US\$36 million over four years (1998–2001) for an initial investment of US\$0.8 million. In another study (Bua 1998), the economic returns to investments for the widespread diffusion and adoption of improved varieties in improving household food security in a number of districts in Uganda through the participatory research and development efforts to control the cassava mosaic disease outbreak in the country was assessed. The internal rate of return (1990–1996) to the participatory interventions was estimated at 121%, suggesting that the investments have been profitable. A favorable benefit-cost ratio of c.7.2 with a net present value (NPV) showing net surplus by 1994 was attained. This high profitability to investment was attributed to the massive responses to the CMD effects, testing, and dissemination of improved varieties in collaboration with complementary organizations.

Due to the success of the efforts in Uganda, other projects with funding support from USAID, IFAD, Natural Resource International, Gatsby Charitable Foundation and Rockefeller Foundation are being implemented to mitigate the effects of CMD in selected countries in Central, East and Southern Africa.

Preemptive management of the virulent cassava mosaic disease in Nigeria

To address the critical threat of an outbreak of this disease in Nigeria, and in support of Nigeria's Presidential Cassava Initiative to revitalize Nigeria's agricultural economy, the Federal Government of Nigeria (FGN), Niger Delta Development Commission (NDDC), governments of the most vulnerable south-east and south-south states including Ondo State, Nigerian National Petroleum Corporation, private sector and others have proposed to support a \$17.1 million public-private partnership project. This project, known as the "Preemptive Management of the cassava Mosaic disease in Nigeria", and implemented through the International Institute of Tropical Agriculture (IITA) aims to mitigate the impact of the cassava mosaic disease and contribute to the development of the cassava sector in Nigeria. The project will address all constraints from production to consumption using the commodity chain approach. IITA and its partners will provide selected local communities with the means to address and guard against in a sustainable way, present and future CMD-associated production collapse of cassava by producing millions of high quality cassava planting materials of the new and durable CMD-resistant cultivars and deliver them to farmers. Higher cassava production/productivity will be promoted by facilitating the development efficient markets, linking producers/processors to agri-input and service delivery systems and financial institutions for credit, and by promoting value adding postharvest processing and storage technologies for competitive and viable commercial enterprises. Through this integrated commodity and market led approach, there is a significant potential to improve food security, increase rural incomes, and increase productivity of this critical crop. A total of \$4.1 million have been provided by FGN and NDDC so far, and the commitments of the state governments and others are at various stages of approval and disbursement.

2. Agronomic challenges

Although improved varieties with potential yield of more than 40 t/ha have been released for cultivation in Nigeria, the average on-farm yields are less than 12 t/ha. The low yields are attributed to poor agronomic practices, low soil fertility, and poor input delivery mechanisms (FMANR 2000). Despite the release of high yielding and pest and disease resistant varieties in Nigeria, many released varieties are yet to be multiplied on a large scale and made available to farmers. Shortage of planting materials is also compounded by farmers' inability to preserve planting materials. The lack of well-organized planting

material multiplication and distribution system in Nigeria is one of the major constraints to the adoption of improved cassava varieties. Making high quality planting material of the improved varieties available to farmers is one of the potential means of ensuring high adoption of the released cassava varieties. Production of planting materials is indispensable in the overall structure of research for conservation of variety purity and supply of high quality planting materials of preferred high yielding cultivars to stem multipliers and producers. The system of multiplication and distribution of planting material is often inefficient either due to non-existence of national seed production schemes or the lower priority on cassava. The supply of certified or high quality planting material is a factor for achieving high storage root yields. Production of large amounts and selection of high quality of planting materials of a vegetatively propagated crop like cassava is a slow process. However, this can be improved using rapid techniques and cutting sanitation.

Low soil fertility in most cassava growing areas is a major problem, as fallow periods have become shorter due to pressure on arable land resulting from increasing population. Commercialization of cassava production will certainly target the cultivation of higher yielding varieties. This will consequently have negative effect on the fertility of the soil unless soil amendments are available. For example, to obtain root yield of over 30 t/ha, 164 kg of Nitrogen, 31 kg of Phosphorus, 200 kg of Potassium, 80 kg of Calcium, 31 kg of Magnesium are mined from the soil at harvest (Asher *et al.* 1980). Applying soil amendments such as inorganic and organic fertilizers can ameliorate the problem of low soil fertility. These fertilizers could be made available through the private sector by linking this activity with the USAID/Nigeria project 'Developing Agro-Input Markets in Nigeria (DAIMINA)' implemented by the International Fertilizer Development Center. DAIMINA has had significant impact on its core states of Kano and Oyo, and could be extended to other states in southern and north-central Nigeria to support this activity.

3.Processing and storage

In fresh form, cassava roots are bulky and perishable. Processing reduces the bulkiness and extends the shelf life and therefore reduces the transportation cost, as well as adding value to the product. The present cassava processing methods are highly labor intensive and expensive. For example, manual processing require a minimum of 4 person-days to peel and wash, 23 person-days to chip one ton of fresh cassava roots which translates to approximately \$65/t of flour (Kormawa & Akoroda, 2003 in preparation) because appropriate processing technologies, machines and tools are not easily affordable and sometimes unavailable at the farm level. In contrast the cost of processing cassava into flour is approximately US\$16/t in other cassava producing countries, such as Colombia (B. Ospina⁵, personal communication) under mechanized processing.

Among other principal constraints to cassava processing are the absence of efficient dryers, peeling machines and pelletizers. Almost all the processes of cassava transformation require peeling of the roots at one stage or the other.

Perhaps the greatest constraint to cassava processing is drying which takes up to 4 days to complete. Drying is a key process for making virtually all cassava products. This is because the major cassava producing zones are also the relatively higher rainfall zones and have longer rain fall months. Solar radiation is relatively low, justifying the need to use dryers extensively for cassava commercialization in southern Nigeria. Although dryers using kerosene, charcoal and electricity exist, they are not used. Their economic advantages have not been widely demonstrated at farm levels. They are also expensive and not energy-use efficient. Flash dryers are the most appropriate machines for drying cassava in powdered form. There are a number of locally made flash dryers that can be used by small-to-medium scale enterprises. However they are also expensive. The development and promotion of efficient palletizing machines for making pellets either for poultry, ruminants, fish and for export is an engineering challenge as more

⁵ B. Ospina, International Center for Tropical Agriculture (CIAT), Cali, Colombia.

Nigerians are becoming increasingly aware of production of pellets for animal feeds. Thus, to make cassava competitive, both for the domestic and export markets, investments in cassava processing machines among others must be a prerequisite

4. Diversifying the use of cassava

Although there is a wide range of cassava products in Nigeria, these are mostly for direct human consumption. This is because the emphasis on promotion of cassava has been focused in the past for its use as food. The greatest constraint to cassava development in Nigeria is the inability to diversify the use of the crop as a basic raw material for industrial use. With changing focus from food to market diversification, like use of cassava in the livestock feed industry, textile, pharmaceutical, alcohol and beverages among others, there is need to explore these opportunities to diversify cassava markets. This requires private-public partnerships, with the private sector investing in market development and procuring needed machinery, while the public sector provides the needed policy environment and physical infrastructure. The market diversification will also require strengthening the presently weak link between industrial processors and producers of cassava products

5. Market and market constraints

A potential market for cassava is in the livestock feed industry. However, the use of cassava for livestock feed in Nigeria is not competitive at the moment. Only about 5% of the total cassava produced is used as feed indicating that the industry is under developed. The current demand for maize in the livestock industry is put at 4.3 million metric tons a year in Nigeria. It is unlikely that cassava will completely replace maize as the basic energy source in livestock feed. Cassava tubers are cheaper than maize in both rural and urban markets, but additional processing costs to chips and pellets are prohibitive due to high processing costs (Figure 5). Secondly, Nigeria has no comparative advantage in the export of cassava chips and pellets because of stiff competition from Thailand (which dominates the export market at the moment), underdeveloped structures for commercialization and favorable domestic prices for maize (Ezedinma *et al.* 2002; Nweke *et al.* 2002).

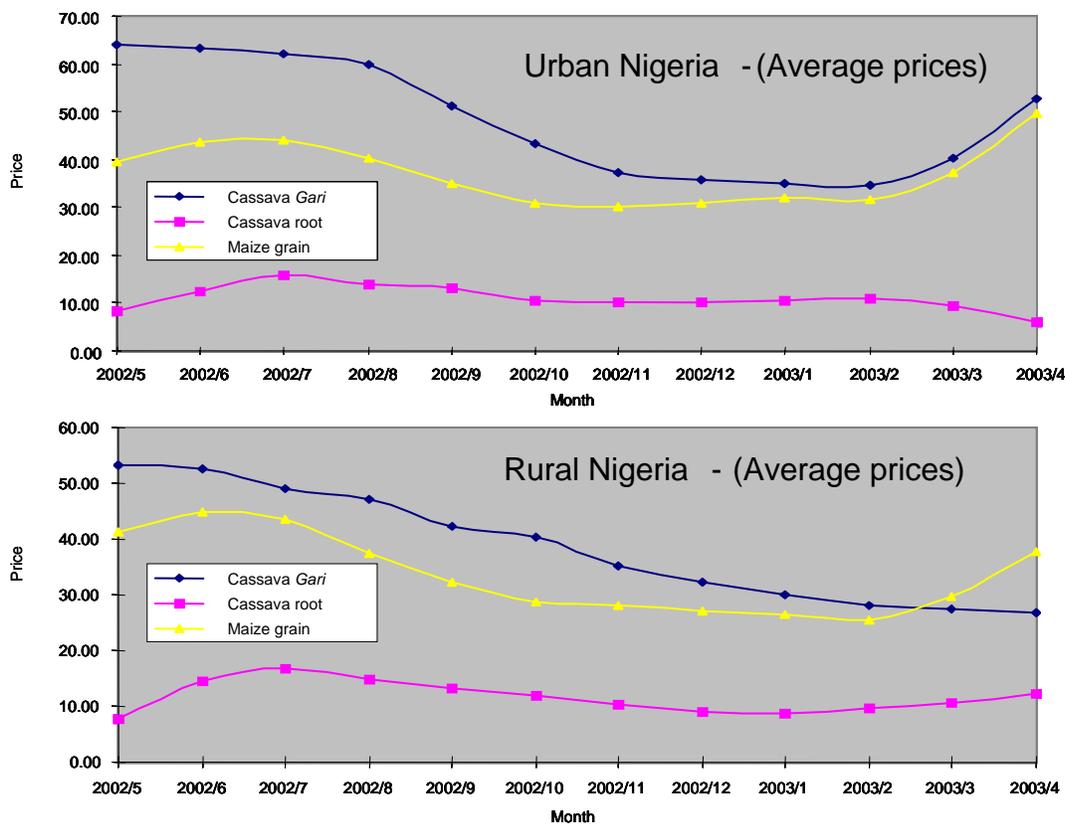


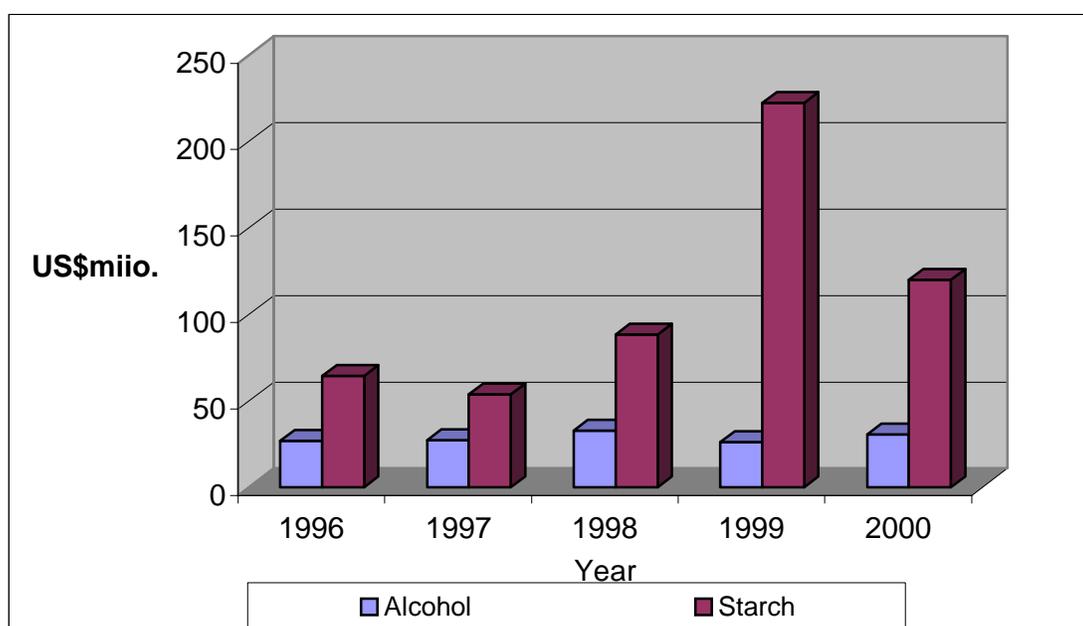
Figure 5 Cassava products and maize prices in urban and rural areas

The enterprises in which cassava is likely to make impact include processing cassava flour for bakery and confectionery, processing sweeteners such as fructose and glucose for foods and beverages, producing starch and adhesives (dextrin) from cassava for the paper, textile, wood and crude oil production, producing crude ethanol from cassava for hospitals, distilleries and pharmaceutical industries, and developing multiplication centers for the planting of materials of improved varieties to satisfy the unmet demand for improved high yielding varieties.

The industry with the most potential for providing a rapid market for cassava is the ethanol industry. Cassava is a very viable source for ethanol. Yield of alcohol per ton is much higher from cassava (150 liters/t of fresh root) than from sugar cane (48 liters/t) - a raw material source that had been used without much success in Nigeria (Bamikole 2002; 2003). A distillery using cassava to produce alcohol can operate year round because cassava is available year round. Nigeria currently imports about 90 million liters of alcohol annually and 80 million liters is used by the liquor industry alone. Substituting 80 million liters of imports with local cassava would require 500,000 t of dried cassava roots (or 2 million tons of fresh roots) valued at (today's prices) roughly 62 million dollars. Figure 6 shows the value of alcohol and starch imports to Nigeria, potential between 1996 and 2000. Development of these two industries as market for cassava in Nigeria would contribute significantly to rural economic growth. Interest in investments in the Nigerian ethanol industry is growing but emphasis on small-scale cassava based production units using cassava, as raw material will provide a rapid alternative market for the commodity. This will definitely increase employment and income for farmers, processors and agro industries along the value chain, thus diversifying the rural economy.

The use of cassava starch as an industrial raw material in Nigeria is low and the market structures are also under developed. In the early 1990s only about 700t of cassava starch was produced per annum because Nigerian cassava starch is considered to be of low quality by industries and none is exported (Nweke *et al.* 2002). Maize starch rather than cassava was preferred especially by the textile and confectionery industry. The harsh economic climate during the military era also led to the near collapse of the textile industry in Nigeria and so reduced the potential market for cassava starch. The positive steps taken by the present democratically elected government to revamp the textile industry will provide an incentive to develop the starch industry given a growing textile market.

The soft drinks industry imports all its syrup concentrate because cassava starch derivatives (hydrolysates e.g. glucose, sucrose, fructose, maltose, and syrup) are not currently developed in Nigeria. The current annual use of starch hydrolysates in the pharmaceutical industry is 1523t but 80% of the raw materials used by the pharmaceutical industry in Nigeria is imported because for now, it is easier, less risky and much less complicated to import than to manufacture locally (RMRDC, 1997). Again in the 1990s, 58,000t of adhesives, a major derivative of starch (dextrin) were used in the wood, cable, paper and printing, packaging and footwear industries in Nigeria. Unfortunately, all these were imported either as adhesives or as dextrin. Developing the starch industry for use as adhesives for these industries would put 60,000t of cassava into use for this industry alone in Nigeria (Nweke *et al.* 2002).



Source: Computed from UNSD-Comtrade, Website accessed June 2003

Figure 6 Value (Million US\$) of Alcohol and Starch Imports to Nigeria, 1996 to 2000

Access to markets

Marketing can be a problem for poor farmers who may not have resources to transport their commodities to the market, especially those living in villages with poor feeder roads. Typically, farmers transport cassava to the market on heads as head loads, on bicycles or in lorries. With poor market access, marketing of cassava can be particularly problematic because of its bulky nature, especially if it is not processed. Poor access also makes movement of goods and people difficult. This is more so during the rainy season when

many parts of the rural area are inaccessible. The roads linking the major towns are usually quite good. Though the farmer market access road network is better in Nigeria than in other countries, the rural feeder road networks are poorly developed and absent in some places. This has significant implications for marketing, cost of inputs, access to health facilities and other social services, and may therefore have adverse effects on production and rural standard of living.

Associated with these are problems of unreliable supply, uneven quality of products, low producer prices, and costly marketing structure, which affects its use for agricultural transformation. Other than these constraints, cassava has great potential once its unique characteristics are capitalized on as raw material for different end uses and product markets. Increasing the range and quality of consumer acceptable cassava-based products, its entry into the animal feed industry, and other industrial applications would raise the demand for cassava, provide the necessary incentive to improve production, expand trade and income generating capacity of cassava producers and processors.

Policy

There is no separate policy articulation for the development of agribusiness sector nor for the cassava subsector in Nigeria. Reference of the Nigerian agricultural policy to agribusiness development is stated in section 4.6 of the 1988 document for agricultural commodity processing. The objectives of that section of the agricultural policy are stated as follows:

- i. to widen the demand base for agricultural commodities and, hence, accelerate the rate of growth of the agricultural sector;
- ii. to preserve perishable agricultural commodities thereby reducing their level of waste and degree of seasonal price fluctuations; and
- iii. diversify employment opportunities in the rural areas through the establishment of rural-based, small-scale agricultural commodity processing industries.

Other than these broad statements, there is no specific articulated national policy that focuses on the development of cassava as an important sub-sector – especially in the areas of agricultural commodity quality standardization, storage, processing, packaging, packing, and marketing. At the moment, there are no such specific policies except for the presidential initiative on cassava.

4. Extension Delivery System to Farmers

The present extension delivery system in Nigeria is ineffective. The Agricultural Development Projects (ADP) are responsible for extension delivery at state levels. For most of the ADPs, the target ratio of EAs 1: 1,000 farmers could not be realized due to myriad of problems, ranging from under funding and unavailability of adequate and appropriate trained human capacity. This has had a negative impact on the effectiveness and coverage of the various cells/circles in a given locality.

Another fundamental problem with extension strategy is the irrelevant nature of some of the recommendations. Quite often, the technological options offered by extension do not fit into the farming system and the socio-economic conditions under which the rural people are operating. Broader range of new varieties that matches different ecologies and end-user requirements should be developed and released to farmers. In order to address this weakness, several different models are possible, including: 1. secondment of a limited number of ADP staff to assist in implementation of the activity; 2. linkage with NGOs, including Sasakawa Global 2000 which is implementing a very successful crop technology activity in northern Nigeria and is prepared to expand its operations; and 3. engagement of the private sector, including agro-input dealers through the IFDC DAIMINA project to facilitate extension of appropriate technical information. In addition, the activity will benefit from the on-going operations of a Farm Service Information Center located in Abia, funded under a USAID/IITA activity to promote market information to

the region through various media, including regular radio programming. This information center will be expanded to become an agribusiness resource center for agribusiness linkages, marketing information, training, technical information and outreach activities.

5. Lessons from USAID and IITA Activities

The proposed project is based on lessons learned through the implementation of various projects within Nigeria and elsewhere in Africa. In particular, the focus on the pre-emptive management of the CMD is based on experiences in Uganda, where the disease could be managed, but commercialization of the crop was undermined because marketing opportunities were not integrated into the disease management interventions. Lessons learned from the USAID/Nigeria funded pilot project, the Rural Sector Enhancement Project (RUSEP) show that promoting market and commercialization must be an essential component of production based activities. More importantly, access to inputs remains a critical constraint to improve productivity. Within the production to consumption chain, the promotion of value-added processing and storage improves rural incomes and investment in production and related activities. An important challenge to stimulating growth in cassava subsector is financial constraint. However, our experience in Nigeria shows that partnership with private financial institutions to provide credit to project beneficiaries is possible, if the project is thoroughly thought through and well implemented.

IITA has been working closely with the private sector to explore the processing and marketing potential for cassava through these activities. For example, IITA provided an analysis to Allied-Atlantic Distillers, Ltd., Ogun State, in preparation for the establishment of a plant this year that will process 70 tons per day of cassava flour (equivalent to 300 tons of cassava root) into crude alcohol⁶. Allied-Atlantic already has plant that converts crude alcohol into ethanol. The results of this analysis indicate that the needs of this one factory will require five cluster centers, involving 7,500 hectares of cultivated land by 7,000 - 8,000 farmers, who will benefit through net returns of \$1,000 per hectare per year. This does not reflect the employment and income generation from small to medium scale intermediate enterprises necessary to support the commodity chain, including chipping, drying and transporting the cassava products. Building on these experiences, a commodity chain⁷ approach is being proposed for the project cassava being the commodity of focus. Promotion of cassava as an engine for economic growth in rural areas in southern Nigeria, would require interventions to address constraints from production to consumption. Thus, the commodity chain approach provides the best approach.

6. The Cassava Project within USAID and SPDC Strategic Development Framework and IITA's Mission

The proposed project falls within the USAID Nigeria proposed Strategic Objective 12 "Improved Livelihoods in Selected Areas". Cassava provides a unique candidate commodity with high economic returns to investment and potential to contribute immensely to the USAID goal to encourage economic growth and agricultural development. The study of the assessment of Nigeria's Agricultural Policy (ANAP) indicated that estimated gross returns for cassava development exceed \$500 million per year (IITA *et al.* 2003). Cassava is the most widely cultivated commodity in rural areas in Nigeria. Thus, the promotion of cassava particularly in areas relating to production, processing, and marketing, and utilization will certainly contribute to enhancing and diversifying the rural economy.

Cassava is also a major food for Nigerians, thus its promotion also support the Presidential Initiative to End Hunger in Africa (IEHA), which is designed to boost agricultural productivity and trade in Africa. The

⁶ Allied-Atlantic Distillers, Ltd. Assessment. IITA. (confidential).

⁷ A commodity chain encompasses a comprehensive set of activities required to bring a product from a concept stage to marketing and consumption of end products (Gereffi 1999).

IEHA targets will include 1. increased productivity; 2. increase in rural income; and 3. increased food availability.

The SPDC operational zone is located within the Niger Delta region of Nigeria. Cassava is also the major staple crop produced and traded in various forms in this region. It was in recognition of this that SPDC joined forces with IITA to implement the most successful technology transfer program in Nigeria in the 1980's. Evidence (Tshiunza *et al.* 2001) suggests that greater impact is achieved through such public private partnerships.

However, the SPDC has grown and learned over the years that a sustainable strategy would be required to break the cycle of poverty, eliminate unemployment and dependency syndrome, as well as the militancy and political conflict in the Niger Delta. Informed by these realities the new focus of the company on a sustainable community interface management strategy is aimed at improving family and community welfare, reducing the level of poverty, and enhancing local productivity. Again these company objectives translate to employment, productivity, and income for the people in the Niger Delta. The fastest vehicle for achieving this strategy is to use what the Niger Delta communities have (namely cassava) to improve themselves. The SPDC therefore intends to attain its strategic objective within a public private partnership built over the years with IITA through the enterprise development and commercialization of the cassava sub sector for the benefit of the communities in the Niger Delta region of Nigeria.

This project will also support IITA's mission to increase food production in tropical Africa, and ultimately to raise the productivity and income of small-scale farmers in an ecologically sustainable way, in partnership with national and international stakeholders.

7. Project Goal

Diversify and strengthen rural economy in selected geo-political zones using cassava as the engine for growth.

8. Project Purpose

Increase economic opportunities through sustainable and competitive cassava production, marketing and agro-enterprise development in selected communities of the South-South, South-East and North Central (Middle Belt) states of Nigeria.

9. Project Objectives

1. To mitigate the impact of Cassava Mosaic Disease and prevent its spread throughout Nigeria and West Africa through diversification, participatory evaluation, multiplication and distribution of CMD-resistant germplasm to farmers.
2. To increase cassava productivity through the generation, promotion and adoption of demand driven, sustainable and competitive cassava production and IPM technologies such as improved germplasm, soil amendments, integrated pest management options and other proven 'best bet' practices.
3. To develop and expand post-harvest processing and storage, and marketing outlets for cassava products to increase incomes and improve livelihoods in rural areas.

For all the desired objectives, strengthening human and institutional capacity of producers, processors, commodity traders, fabricators etc to produce, process and market cassava efficiently as well as increasing private sector investment in production, processing, storage and marketing, will be fundamental tasks.

10. Project Implementation Strategy with Activities in Achieving Project Results

Result 1: Impact of the cassava mosaic disease (CMD) reduced

Activities

- 1.1 Evaluate new CMD-resistant varieties through expanded on-farm testing as well as demonstration plots in different states and with a range of stakeholders and farmers.
- 1.2 Establish and maintain a strategic reserves of diverse CMD-resistant varieties for food, feed and agro-industrial uses through the use of extension network and private sector multiplication and dissemination of the improved CMD-resistant varieties.
- 1.3 Provide technical assistance and training to producers associations, extension agents and NGO staff (training of trainers) in rapid multiplication techniques and nursery management.

In order to reduce the impact of the CMD, farmers need access to improved, CMD-resistant varieties. IITA has already screened the best-adapted cassava varieties and have also begun dissemination on a limited scale. Under this activity, these new CMD-resistant germplasm be tested widely in the target states through participatory multilocational and expanded on-farm testing as well as demonstration plots in different states and with a range of stakeholders and farmers. The superior multiple disease-resistant cassava varieties will be promoted in large-scale demonstration plots in farmers fields. The demonstrations will utilize farmer and consumer participatory approaches to supplement the information collected at research stations to identify truly superior varieties. The ‘mother-baby’ demonstration approach will allow for wider exposure of superior cultivars to farmers at low cost. This approach has been used to test and disseminate crop varieties and resource management technologies in southern Africa and involves complementary sets of demonstrations grown by researchers and farmers in farming communities. For each researcher designed ‘mother’ demonstration there are 6-12 ‘baby’ trials within walking or cycling distance. The ‘mother’ trial evaluates a set of promising cassava cultivars under different management conditions and is located in the center of a farming community and managed by an extension officer or member of an NGO. These “mothers” will act as community-level technology transfer centers ‘Baby’ demonstrations contain four (or fewer) of the cultivars in the mother trial and are sown and managed by farmers.

CEDP will maintain the flow of new CMD-resistant germplasm and facilitate the establishment of strategic stocks of CMD resistant varieties in Nigeria. IITA and collaborating partners will conduct expanded on-farm testing of new varieties from IITA with end-user participation so as to make a diverse range of new CMD-resistant varieties available to farmers in the quickest possible time, in targeted communities. Assessments will be made of quality characteristics for specific end uses. These will include consideration of cyanogenic potential, starch yield and quality, dry matter content, pasting properties, cooking characteristics and the suitability of varieties for the dominant food and product preparations within the country. This should provide farmers with opportunities to access a wide diversity of germplasm combining multiple pest-disease resistance with preferred food, feed and industrial quality characteristics in the shortest possible time. Primarily the national research programs, NGOs, extension services and farmer groups will undertake these activities.

The lack of well-organized planting material multiplication and distribution system in Nigeria is one of the major constraints to the adoption of improved cassava varieties in the country. Making high quality planting material of the improved disease resistant varieties available to farmers is one of the potential means of ensuring high adoption of the released cassava varieties. Production of planting materials is indispensable for conservation of variety purity and supply of high quality planting materials of preferred high yielding cultivars to stem multipliers and producers. The system of multiplication and distribution of

planting material is often inefficient either due to non-existence of national seed production schemes or the lower priority on cassava. The supply of certified or high quality planting material is a factor for achieving high storage root yields. Production of large quantities and selection of high quality planting materials of a vegetatively propagated crop like cassava is a slow process. However, this can be improved using rapid techniques and cutting sanitation. **To complement this effort, training for improved practices for selection, handling, production, and distribution of cassava planting material will be intensified. This will be done through a consultant to be hired periodically on a short-term basis.**

This project will build on existing initiatives established through the IFAD-RTEP project, and will use the three-tier approach to multiplication that has been used so successfully in other parts of Africa. The approach involves primary multiplication (station based and typically > 10 ha), secondary multiplication (Local government-based and typically > 2 ha) and tertiary multiplication (at the farmer's level and typically <1 ha). Rapid multiplication techniques will be practiced at primary sites where irrigation is feasible. The more numerous local government based secondary sites will use conventional multiplication methods, and like the primary sites, will be managed by project partners. These partners will be encouraged and helped to evolve the planting material schemes for continuous supply to farmers. Farmers, farmer groups, private sector and NGOs will manage tertiary sites. Multiplication sites will be sited at strategic locations and in areas most severely affected by CMD for easy access to planting materials. At the farm level, a community-based private sector driven approach to sustaining multiplication and distribution of planting materials of the new cassava varieties will be encouraged.

In addition, since the inception of the project in July 2004, more Nigerian farmers participate in commercial cassava production and processing especially after the Federal Government's policy on the 10% inclusion of cassava flour in bread making. This has contributed to an increase in demand for improved cassava varieties. Therefore, more multiplication and demonstration centers will be set up in Abia, Akwa Ibom, and Cross River States (USAID core States). Three more LGAs will be included in each of these States.

Result 2: Productivity of cassava increased through the generation, promotion and adoption of demand driven, competitive and sustainable cassava production and IPM technologies.

Activities

- 2.1 Facilitate farmers/producers groups' access to inputs, credit, improved varieties, information and technologies (fertilizer, agro-chemicals, tractor services, appropriated machines, etc) to support competitive and sustainable cassava production.
- 2.2 Identify and provide technical assistance and training to producers associations, extension agents and the private sector to facilitate farmers' adoption of improved technology packages and their access to credit and other inputs.

Sustainable integrated pest management and best-option production technologies will be tested and adapted to manage the most important cassava plant protection and production problems under farmer-managed conditions. Key components to the sustainable approach to cassava production development will include the deployment of high yielding disease-resistant varieties, phytosanitation, cultural practices and sustainable soil fertility management. These will be integrated and tested with farmers using participatory methods.

The project also recognizes the importance of facilitating development and strengthening of effective producers' associations as well as facilitating the development of the private agri-input businesses that will

provide farmers/producers groups with access to inputs to support competitive and sustainable cassava production. The project will facilitate and stimulate access to inputs, credit, improved varieties, information and technologies (fertilizer, agro-chemicals, tractor services, appropriated machines, etc) by working closely with the private sector to drive this development, and provision of technical assistance and training.

Result 3: Post-harvest processing and storage, and marketing outlets for cassava products developed and expanded

Activities

- 3.1 Identify processing and marketing needs/opportunities and promote post-harvest technologies (processing and storage) to reduce crop losses, drudgery and improve the quality of marketable cassava products for defined markets (domestic and export) and trade.
- 3.2 Facilitate the development and strengthening of effective small and medium scale postharvest groups' and enterprises' and facilitate their access to inputs, credit, information (market identification, product development, storage and enterprise development) and other improved technologies and links to appropriate domestic and export markets.
- 3.3 Develop an active market information acquisition and dissemination system for use by stakeholders in the cassava commodity chain to make informed decisions.
- 3.4 Stimulate and promote advocacy (through participatory mechanisms) for strategic policies to enhance cassava competitiveness, commercialization and trade.

Improved processing, storage and packaging technologies will contribute to increased cassava root availability, reliability and quality, thus stabilizing prices and facilitating trade. In spurring rural industrial development and raising the incomes of rural communities, cassava starch can be used directly in different ways as a raw material for further processing. High quality cassava flour and chips can be produced and fed into rural and urban-based industries for use by the food processing industry. The foliage and other plant parts, which are sources of protein, vitamins and minerals could reduce the cost of animal feed and increase the access of consumers to animal protein. There is a need to identify models for bulking and grading at the community level that can assure regular supply to potential large users in urban areas and reduce transport costs. Linking small-scale cassava farmers and processors to existing, improved, or new growth markets will establish the capability and capacity to integrate research and development activities on cassava production, processing, and marketing to capture the market potential for the crop. This will enable cassava products to be developed as widely traded commodities that contribute to the economic growth. This project will demonstrate and promote a range of post-harvest technologies at community in order to facilitate the development of cassava-based agro-enterprises.

Processing using low-cost machinery and processes for producing high quality intermediate products under small-scale rural conditions would be encouraged on-farm or as near the farm as possible to reduce transportation costs. Storage and packaging technologies to extend product shelf life will contribute to increasing reliability of supply, stabilize prices and facilitate trade. Particular attention will be paid to immediate processing of harvested storage roots into chips or flour to extend their shelf life. The flour/chips may be converted to secondary products before sale thus providing farmers an opportunity to retain a greater share of the value-added to the commodity or sold to middlemen for bulking and supply directly to factories at locations with established cassava based industrial units. Pilot processing centers at the community level will be established and these will open new market opportunities to the farmers if linked to a market. Linkages will be established with other research and development institutions to transfer suitable processing technologies. Smallholder farmers and/or farmer co-operatives at project locations will

be given assistance through training in testing and adopting recommended technologies for primary processing in collaboration with partner development institutions.

Under the previous USAID/SPDC funding of CEDP, only 1 small processing center (Umuekechi type) was planned for each of the 6 core States within 5 years. There is currently an increase in demand for processing centers. In order to meet these new requests our target of establishing 300 plants in 5 years needs to be increased. An additional 18-30 micro processing facilities will be installed in the Abia, Akwa Ibom and Cross River States (6-10 per State) in addition to the processing centers already planned. A micro-processing center comprises of a shed and equipment (1 grater, 2 pressers, 1 sifter, and 3 tray fryers). The Technoserve/EfDI study has shown that a large-scale cassava factory may be more profitable in the long run, but only involves a small number of farmers. In order to meet our ambitious project targets, we feel that it is appropriate to use additional funds for activities from which a high number of farmers can quickly benefit. In view of the Technoserve/EfDI study, the additional impact with regard to improved livelihoods of farmers is expected to be higher if the funds are used for small-scale processing centers.

Cassava has often been described as a “woman’s crop”, however, detailed study by the Collaborative Study of Cassava in Africa (COSCA) in six African countries found that the categorization of cassava as a “woman’s crop” is misleading. The study showed that the proportion of the household cassava field area owned by women in Nigeria was 11. By contrast, the proportion of fields owned by men was 81, while joint ownership by both men and women accounted for the balance of percentages (Nweke and Enete 1999, Nweke *et al.* 2002).

In terms of labor allocation for cassava production, both men and women are engaged in different cassava production tasks. Men typically work on land clearing, plowing, and planting, while women perform weeding, harvesting, transporting, and processing tasks. However, as cassava transformation advances to the stage of cash crop, men contribute more labor to cassava production, while women assume increasing responsibilities in cassava production and processing tasks. Although women are mainly involved in cassava processing, fewer women owned cassava-processing machines than men. However, they have easy access to processing machines.

Women also play an important role in cassava processing. COSCA study showed that in 76% of the villages selected in six African countries, processing was carried out by women. In Nigeria, where cassava processing has been mechanized men carry out mostly the grating and pressing tasks. In cassava processing, women manually peel and wash cassava, men grate and press the cassava, while women toast the mash to make granulated products. Women also play a major role in cassava marketing. Fresh cassava root sales are mostly done by women mostly in the fields.

The CEDP adopts a holistic approach by introducing improved cassava varieties and processing technologies that will improve the economic returns of cassava production and processing. Thus, specific activities aimed at the introduction and promotion of labor saving devices for cassava processing. The resulting impact of the introduction of post harvest labor saving devices will reduce drudgery on women. The CEDP will particularly target women, who play important roles in cassava processing and marketing. In implementing activities that target women, specialized local NGOs that focus on women and commercialization will be engaged as partners to ensure gender mainstreaming. Also, the CEDP will engage the services of a local gender specialist as visiting scientist to particularly work with women NGOs to mainstream gender issues in this project.

The primary objective of this activity is to undertake comprehensive cassava sub-sector analyses of the value chain. This will involve the mapping of the commodity from cultivation through use as food, raw material production for industry to processing and marketing. This will include through costing of all inputs, investments and sales

A commodity sub-sector is understood as a vertical slice in the commodity flow from input supply through to consumption showing all stages and agents. It shows the links between producers and consumers through the processes of buying, storing, transporting, processing and selling the commodity.

Data collection will be conducted in three stages: first, wherever available, published data would be used to establish the structure, conduct and performance of the cassava sub-sector. Secondly, a rapid appraisal survey will be conducted using focused group interviews and key informants to obtain information on trading patterns, transportation facilities, processing potential and marketing systems in selected villages and urban areas. Interviews will cover all stakeholders, including farmers, village leaders, and community organizations such as women's groups, extension agents, traders, processors, credit lenders, NGOs, marketing agents and agro-business entrepreneurs.

The report from this survey will be mainly the description of the commodity value chain, the intervening agents, the major constraints and opportunities in Nigeria (and the sub-region). Results from this analysis will be used to pick out those links in the chain where an investment could achieve considerable financial gains for a large group of producers. It will also help to further refine the CEDP implementation strategy for integrating the small holder producers into the local market economy and possibly the sub-regional market'

In integrating women when linking industrial processors with production of cassava products, women cassava farmers or traders will be organized into groups or associations to ensure collective negotiation and marketing of products. It is these groups that will be linked with industrial processor. The CEDP builds on our experience in working with farmers' groups through out Nigeria. Our experience show that this "bulking" of products reduce assembling costs for "commodity brokers" or industrial processors, and reduces transportation cost on the side of the producers thus, encourages beneficial linkage between the smallscale producers and the brokers.

However, while we plan to organize women cassava producers and traders into groups at community, state and federal level, the structure of the groups/association will be determined based on information generated from community and partner analysis and information from the gender disaggregated. Where the culture of CEDP target community permits and does not disadvantage women when organized into mixed groups (with men), such will also be organized if it is required to meet bulking (volume) targets of brokers. However, the nature of grouping into "women", "men" or mixed will be determined by the CEDP participating women themselves. A gender specialist on the team will ensure that gender issues are mainstreamed in all CEDP activities.

There is a need to improve access to financing for cassava producers, processors as well as agricultural input suppliers if CEDP is to have rapid impact. Our experience with the RUSEP project and similar projects in Eastern Africa (FoodNet), suggests that it is more effective to work with existing financial institutions or input providers (as the case may be) and to build workable mechanisms where possible. In linking small and medium scale enterprises to financial institutions, we will identify local private sector partners, and NGOs for strengthening CEDP clients' access to credit. This approach has worked perfectly with the Union Bank Plc., Nigeria providing credit to RUSEP farmers in Nigeria. **Current experiences in CEDP suggest that the vision of setting up viable micro and small processing centers in the SS and SE of Nigeria may not be realized rapidly because some of the newly established centers could not run to the desired capacity because of lack of starting capital. Through a sub-contract a microfinance component will be developed to support the development of profitable enterprises which will generate more employment opportunities and income for the rural poor. The best approach of running such a sub contractual activity will be developed in collaboration with financial institutions and other potential partners such as NNF, STEP etc.**

The development objective of this activity is to provide market information service (MIS) and market intelligence on cassava, and other agricultural commodities; inputs, nation wide for use by stakeholders (producers, processors, researchers, input dealers, product marketers and end-users) in the cassava commodity chain to enable them make informed decisions that will enhance cassava productivity, incomes and trade. Although market information is an important component in trading, this service is hardly functioning in Nigeria. Consequently, farmers and many traders are left with little information for negotiation. This leads to both parties taking risks in trading and the cost of this risk is often born most heavily by the producers, who accept low prices and consumers who must pay high prices. This also serves as a disincentive to investment. The CEDP will work with other national and regional agencies to develop an efficient MIS. This will involve collecting price and market data, and processing and dissemination of information to both domestic clients and international market clients. The CEDP will partner with both domestic and regional MIS, where necessary, to strengthen capacity in the collection and delivery of basic MIS data from producers, traders, policy makers and others associated with the cassava commodity chain.

IITA is cognizant that women traders would require customized information, thus this will become central to the design and implementation of MIS. With this in mind, the first activity in developing the MIS will be to assess the information needs that will help women traders to better negotiate and trade cassava products. Also, we will assess existing MIS, their targets, and coverage. This will ensure that we avoid duplication of efforts. Lessons from the existing MIS and information gathered on market information needs specific to women traders will be used to develop customized market information targeting women traders.

In developing the customized market information, the CEDP implementing team will work closely with women traders groups/associations, especially in the formulating the type of market information required, form in which information should be packaged and disseminated, frequency of information delivery and mode of dissemination etc. In addition to the customized information, women traders will be trained in the use of the information to better enhance their trading and negotiating capacity.

At the implementation level, we propose to work closely with cassava growers/processors associations, brokers, and the industrial processors in targeting women cassava traders so that they are not disadvantaged in the process of commercialization. The CEDP will also liaise with NGOs and other groups promoting the interest of women traders or associations to explore synergies for the benefit of women cassava farmers and traders in the CEDP states. **PMC approved 8 State Managers to coordinate activities in the 11 CEDP States. However, only 7 new vehicles were ordered, out of which two were supposed to be used by the coordination office. Three vehicles inherited from RUSEP were also allocated to the State Managers. Two of these RUSEP vehicles are fairly used and would not adequately meet the requirements of the State Managers who would be traveling extensively on rugged roads for the next 5 years. Therefore, there is need to purchase two more 4x4 vehicles in replacement of two of the RUSEP vehicles.**

The momentum and enthusiasm in implementing the CEDP agenda especially in the USAID States will be accelerated. CEDP in collaboration with other stakeholders will contribute to increased awareness through the production of more flyers, posters, TV programs and interviews, and the organization of one major exhibition involving participants from Thailand, Brazil, China, Malaysia in the USAID States, etc.

Monitoring and evaluation

Activities

1. Collect detailed baseline information in project target states
2. Monitor and evaluate impact of project activities on rural incomes and employments, including factors responsible for adoption of cassava production, processing and marketing technologies

Prior to CEDP implementation, a team of key scientists in collaboration with other CEDP partners will carry out a needs assessment in the target geopolitical zones to identify target communities (producers), processes, middlemen, fabricators, and other key stakeholders, using criteria set in the CEDP focus (market access, supporting services, high probability of success, etc). Once potential players have been identified, they will become an integral part of the CEDP implementation process. Planning workshops will be convened to define administrative and technical roles of each partner, specify end user needs, and agree on the contractual obligations of each partner.

A needs assessment will be implemented to identify major constraints and opportunities for commercializing cassava in the targeted communities. Teams comprising of an agronomist, agricultural economist, a food technologist, enterprise development specialist, and an agricultural engineer) will undertake a needs assessment of the cassava sub sector in target zones (SS, SE and NC) over a period of six months. Using formal questionnaires and informal interviews, the team will collect information on the vertical perspective of the cassava industry, domestic and international competitors, coordination between firms and linkages, points of leverage (e.g. credit availability, national policy, processing technology, improved varieties etc), stakeholder commitment especially local organizations and markets. The three-person team will write and present a report of the field survey to CEDP management team and stakeholders. The report will reflect the size of the different cassava markets, its growth prospects, product flows, quality and standards, industrial and non industrial uses, and the characteristics of the target groups and beneficiaries namely farmers, processors, small and medium scale entrepreneurs, agro industries and investment climate. Using information obtained from the needs assessment, performance and monitoring indicators will be developed which will be later used to evaluate the impact of the CEDP on the intended beneficiaries and the rural economy. These indicators will support the IEHA framework as well as the emerging USAID/Nigeria Mission SO12 Results Framework.

To tackle the dearth of information, more accurate baseline estimates of processed cassava products will be carried out in Abia, Akwa Ibom, and Cross River States where USAID is currently supporting cassava development activities. This data will be updated annually and will include cassava products such as flour, ethanol, gari, starch, livestock feed, etc. These studies will provide additional information in order to complement the baseline studies that have already been conducted. If need be, these studies could be subsequently extended to the remaining Niger Delta States, depending on the availability of funds.

Participatory project evaluation and monitoring will be carried out annually (including mid-term) by all stakeholders to assess results against a given set of performance indicators (to be developed after needs assessment), introduce interim adjustments and generate feedback for future planning. The CEDP co-coordinating office in collaboration with the CEDP management committee and all key partners will participate in the CEDP reviews. Monitoring and planning meetings will appraise technical and reports and progress made towards attainment of CEDP objectives. Monitoring and evaluation will include reviewing achievements, identifying constraints, establishing priorities for future activities, evaluating human and financial resources available and those required to effectively carryout the planned activities, and to identify training needs.

This activity will generate new knowledge on adoption pathways and critical events that promote and prevent the adoption of improved technologies. Studies will involves analysis of the current adoption status and document the history, trends, patterns, and prospects of technology adoption. Adoption studies will be also concerned with how far the introduction of an improved technology has been successful in meeting socio-economic objectives and how well improved agricultural technologies have satisfied the needs and priorities of households and other units in the target population. These studies will be done in closely linked to impact studies.

At the end of the CEDP, an impact specialist (to be subcontracted by the CEDP) will conduct a detailed impact assessment to document the impact of the CEDP on all key players in the cassava sub sector and on the rural economy. In addition to economic impact assessment, the social impact of the technology interventions involved in the CEDP on the lives of people, their welfare, gender relations and other social processes will be measured.

The final activity of the CEDP will be a national stakeholders end-of-project workshop involving project partners, policy makers and all those interested in the cassava sub sector. The workshop will review all achievements and recommend scaling up of success stories.

Finally, human and institutional capacity building in this project will be accorded high priority for all the objectives. The project will engage technical providers to address constraints identified by the project in a manner that *explicitly* builds local capacity. In particular, preference will be given to technical providers - both private and public - in the CEDP zones. Where necessary these providers will be backed up with relevant institutions such as specialized market, trade and processing companies and relevant technology providing centers. In instances where technical backstopping is provided by a sub-contractor from outside the country, the engagement arrangement will be done in such a way as to leave behind capacity and minimize dependency. For example, should some policy work be needed, a national university or institute could be engaged. If such a national institute will need help, IITA could engage the services of more competent international organization to assist them. In such instances, the terms of reference of the international organization will be so defined such that the capacity of the local institution will be enhanced.

Capacity building will extend to assisting small producers and agribusinesses to organize into relevant professional associations. Giving the CEDP target beneficiaries a voice is an effective way to get at transaction costs of all kinds, including getting appropriate policies adopted. The CEDP will seek to leverage its efforts with those of other interested parties – private sector (larger more established agribusiness firms, other donor projects to explore synergies for expanded impact.

In strengthening the capacity of women to position themselves to market and trade cassava, women cassava producers/traders groups/associations will be formed and strengthened in the CEDP target states. The CEDP will target capacity building of women in these groups to better position them market and trade cassava/and cassava products. Capacity building needs for women or their group leaders will be identified during the needs assessment. Again, the gender specialist in the team will pay particular attention to human capacity development needs for women cassava producers and traders. Once the capacity building needs have been identified, specialized trainings will be developed for women.

On a more practical level, it is envisioned that this will be done through local NGOs and CBOs with capacity to work with women, and the Women in Agriculture Program of the ADPs. Where capacity of these local NGOs and CBOs is weak to effectively train the women, IITA will engage other partners with such capacity to enhance the capacity of the local NGOs and CBOs to deliver the required trainings effectively. Through this approach, sustainability is guaranteed even after the end of the CEDP.

11. Project Operational States

Results from the from ANAP study (IITA *et al.* 2003) showed that cassava is the commodity having greatest comparative advantage for investment in the North Central, South South, South East, and South West Regions of Nigeria. Using the ANAP as a guide, the CEDP for the SPDC – USAID partnership will focus on selected communities of 11 states of the South-East and the South-South geopolitical zones including the Niger Delta region, an especially impoverished area of Nigeria. While all project activities will be carried out in core states of SPDC and USAID, which include Abia, Akwa Ibom, Bayelsa, Cross River, Delta, and Rivers States, some project activities will be carried out in the remaining states

(Anambra, Ebonyi, Edo, Enugu and Imo States). Specific project activities will initially focus on a select number of sites in order to develop cassava clusters based on the following criteria: current cassava production and production potential, land availability, presence of alternative crops, rural infrastructure, existing or proposed agro-industry, existing support schemes for cassava, leveraging of funds from State government/private sector. Possible local partners will be identified during needs assessments studies and project planning. It is anticipated that a total of about 300,000 farm` families will benefit from this program.

12. Budget

The CEDP seeks US\$ 11.7 million from the USAID, SPDC and IITA to support an integrated, 5-year activity to develop the cassava sector through a public-private partnership with key stakeholders. **See separate attachment for detailed budget and budget notes.**

13. CEDP Performance Monitoring Plan

The details are shown in annex 1 (**see separate attachment**).

14. Project Management, Monitoring, and Evaluation plan

The governance structure of CEDP is illustrated in Figure 9 below.

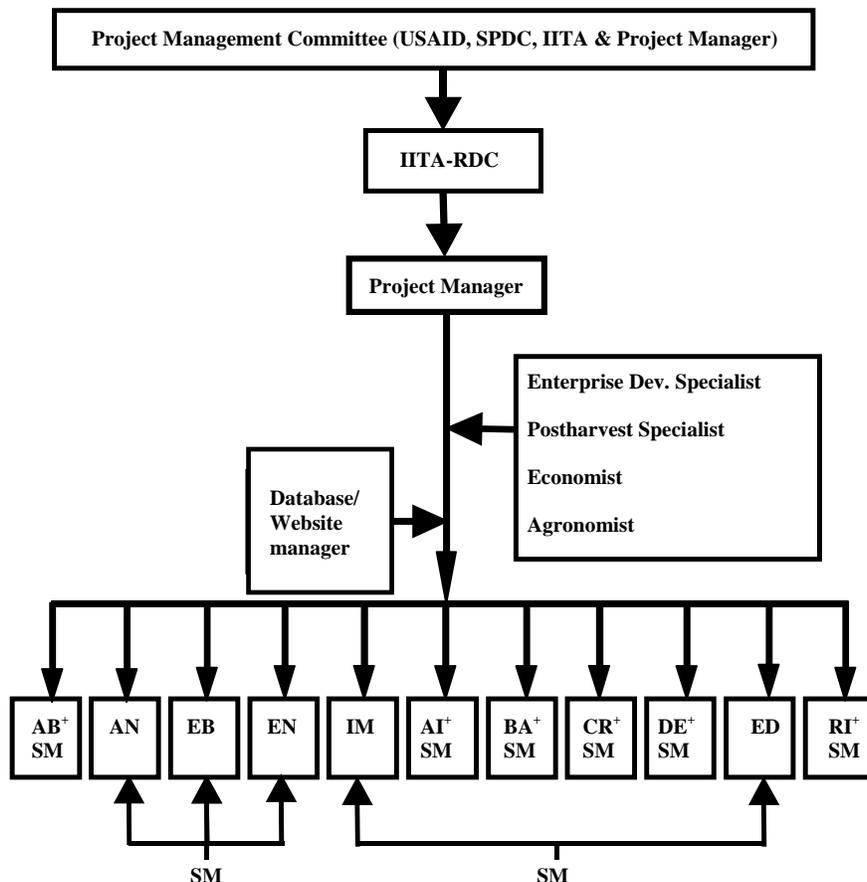


Figure 7 Project Governance Structure

States: AB = Abia; AI = Akwa Ibom; AN = Anambra; BA = Bayelsa; CR = Cross River; DE = Delta; EB = Ebonyi; ED = Edo; EN = Enugu; IM = Imo; and RI = Rivers.

+ = Core State

SM = State Manager with stakeholders advisory committee/cassava enterprise association.

RDC = Research-for-Development Council of IITA

USAID = United States Agency for International Development

SPDC = Shell Petroleum Development Company

IITA = International Institute of Tropical Agriculture

Project Management Committee

A Project Management Committee (PMC), consisting of representatives of the three partners (USAID, SPDC and IITA) shall be established for the CEDP. The PMC shall meet annually to review progress and approve the subsequent annual plan and associated budget, engagement of certain categories of sub-implementing partners, and the management plan. The committee will meet additionally as needed. The PMC shall meet annually to review progress and approve the subsequent annual plan and associated budget, engagement of certain categories of sub-implementing partners, and the management plan. The committee will meet additionally as needed. IITA shall provide quarterly reports and financial statements to the partners.

The USAID CEDP Manager is Dr. Andrew Levin, USAID/Nigeria Agricultural Officer, or such person as may be designated in his/her absence. The USAID CEDP Manager will oversee USAID’s relationship with the IITA and SPDC with respect to the CEDP activities described in this project document. The SPDC CEDP Manager is Mr. Samuel Agili, SPDC Economic Empowerment Advisor, or such person as may be designated in his/her absence. The SPDC CEDP Manager will oversee SPDC’s relationship with the IITA and USAID with respect to the CEDP activities described in this project document.

CEDP will be implemented by IITA in line with the approved project implementation plan. The IITA CEDP Manager is Dr. Alfred Dixon, IITA Agronomist or such person as may be designated in his/her absence. The IITA CEDP Manager will oversee IITA’s relationship with USAID/ SPDC with respect to the CEDP activities. IITA shall appoint an internationally recruited staff (Project Manager) for the CEDP subject to approval by the other partners. The Project Manager shall manage the implementation of the CEDP activities as described in this project document, and shall be an ex-officio member and secretary of the PMC. Other project staff recruited in both the coordination office, and the state offices will assist the project manager in implementation of project activities. The implementation will additionally be guided by the following partner roles and accountabilities.

SPDC	USAID	IITA
Provide oversight on CEDP implementation.	Provide oversight on CEDP implementation.	Provide oversight on CEDP implementation.
Receive quarterly progress report and review presentation	Receive quarterly progress report and review presentation	Provide regular quarterly reports and updates on program performance
Will disburse funds according to the IITA-SPDC agreement	Will disburse funds according to the IITA-USAID agreement	Will requisition for funds according to the terms of the separate agreements.
Attend all project management committee, annual program planning and stakeholder meetings	Attend all project management committee, annual program planning and stakeholder meetings	Organize and attend all identified program meetings.
Support efforts to involve governments in the program	Facilitate the involvement of governments in the program.	Facilitate the involvement of governments in the program.
Support implementing partner’s efforts in stakeholder engagements	Support implementing partner’s efforts in stakeholder engagements	Facilitate the involvement of all other stakeholders including private sector, women’s groups, NDDC, NGOs, IFAD, Union and other commercial banks.
Make known as appropriate opportunities for integration with other SPDC-involved programs	Make known as appropriate opportunities for integration with other USAID programs	Design program to offer opportunity windows for integration of other programs in which the other partners are involved.

State Stakeholders Advisory Committee/Cassava Enterprise Association

At the onset of the project implementation, a stakeholders' meeting of target states will be held for sensitization of stakeholders of the project and for identifying effective collaborative partners for project implementation. During this meeting, a stakeholders Advisory Committee/Cassava Enterprise Association will be appointed from representatives of the Federal Ministry of Agriculture and Rural Development, state governments, national agricultural research system (NARS), producers' associations, private sector, NGOs, CBOs and donor representatives of the project. In essence, the state committees/associations will serve as advisory arm of the project including the monitoring and evaluation of project performance, and will normally meet once annually. The official membership of the state committees/associations will normally not exceed 7. The chairperson of the state committees/associations will be elected yearly among the members. The state coordinators will serve as secretary to the committees/associations.

Management of project funds

Project funds will be managed and accounted for by IITA. The project manager will be responsible for day-to-day management of operating and research funds. Funding in support of national activities will be disbursed directly to the participating collaborating institutions and will be made according to approved budget and in tranches following receipt of financial statements on expenses previously incurred. The preparation and submission of financial statements to the donors will be the responsibility of the IITA Budget and Finance staff. Reimbursement from donors will be requested in accordance with the Memorandum of Grant Conditions.

Project monitoring plan

Monitoring and evaluation will provide the means for assessing results against planned objectives introduce interim adjustments and generate feedback for future planning. The project will be monitored through the assessment of progress against targets and indicators provided. Assessments of progress will be made both on the basis of reports received from collaborators, and from visits made by IITA scientists and support staff as well as collaborating partners to sites of project activities. At the end of each quarter of the project, a cumulative measurement of the project's achievements will be set against the end of project target for each activity. This will provide a measure of the project's progress in completing the activities which, when fully accomplished, will lead to the attainment of project objectives.

Annual program review and planning meetings will also be instituted to appraise technical and financial reports and progress made towards attainment of project objectives.

Monitoring Progress and Measuring Impact

Monitoring and evaluation will provide the means for assessing results against planned objectives, introduce interim adjustments and generate feedback for future planning. As the project starts, and during the first year, an ongoing baseline diagnostic survey of cassava agroecosystems as well as the subsector analysis will establish a true and most precise status of the distribution and severity of various cassava biotic, agronomic, and socioeconomic constraints including marketing needs and opportunities in the project areas. In addition, the knowledge of the structure and performance of the subsector will guide project interventions.

Assessing impact of project interventions on trends of cassava production, processing, utilization, marketing, and trade is paramount to the success of the project. The potential impact of interventions measured by objectively verifiable indicators will be evaluated against baseline information. The draft set of indicators (see result framework (separate attachment) should therefore assist in identifying key data sets

required to provide the basis for evaluation of the project. They have to address such issues as changes in productivity and income, adoption rate, impact on resource-base, to mention but a few. Donors and IITA representatives, in conjunction with participating country officials, will assess project accomplishments by conducting a final evaluation.

The project will also employ the services of an external party, preferably an independent consultant to assess the impact of the project in its final year, and the pre- and end-of-project survey demonstrates positive impact on increased productivity, rural income, and food availability.

Project evaluation and audit

Development investors and IITA representatives, in conjunction with external resource persons will conduct the project evaluation. The review will assess project accomplishments to the extent practicable and assess the impact of the project. Projects financial audits will be conducted by IITA's Internal Auditor and/or as required by the development investors.

Reporting

The Project Manager through IITA will prepare quarterly and annual reports on technical matters for submission to the development investors. Sixty days prior to the completion of this project, the Project Manager will prepare a draft of the final report incorporating a review of project achievements, problems encountered, and recommendations for future activities with regard to specifically stated objectives. The Project Manager will also report through the Budget and Finance Department of IITA for financial matters, and through the Contracts and Grants Office of IITA for any other matter. These IITA units would then finalize the technical and financial reports for submission to the development investors. IITA shall submit to the development investors on a quarterly basis, financial reports of its expenditure and accruals through its Budget and Finance Department. The format for this reporting will be in accordance with the development investors' directive. All reports will be submitted by IITA to the development investors supporting the project.

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