



GUINEA AGRICULTURAL SECTOR ASSESSMENT (GASA)

FINAL REPORT

February 9, 2004

**Rural and Agricultural Incomes with a Sustainable Environment (RAISE)
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ACRONYMS AND ABBREVIATIONS

ACA	<i>Agence pour la Commercialization Agricole</i>
ADRA	Adventist Development and Relief Agency
AFD	<i>Agence Française du Développement</i>
AfDB	African Development Bank
AGOA	African Growth and Opportunity Act
CAFR	<i>Cellule d'Appui aux Femmes Rurales</i>
CAOPOA	Support Units for Farmers' Organizations
CFDT	<i>Compagnie Française du Développement Textile</i>
CGIAR	Consultative Group International Agriculture Research
CLUSA	Cooperative League of the USA
CRD	<i>Communauté Rurale de Développement</i>
DYNAFIV	<i>Projet d'Appui a la Dynamisation de Filières Vivrières</i>
EU	European Union
FAO	Food and Agriculture Organization
FG	Guinean franc
FIV	<i>Fonds d'Investissement Villageoises</i>
GASA	Guinea Agricultural Sector Assessment
GDP	gross domestic product
GOG	Government of Guinea
IFAD	International Fund for Agricultural Development
IRAG	<i>Institut de Recherche Agronomique de Guinée</i>
IRR	internal rate of return
LPDA	<i>Lettre de Politique de Développement Agricole</i>
LTC	Land Tenure Center
MAEF	<i>Ministère de l'Agriculture, de l'Élevage, et des Forêts</i>
MT	metric ton
NGO	nongovernment organization
NRM	natural resource management
OICI	Opportunities Industrialization Centers International
OPAs	<i>organisations professionnelles agricoles</i>
PACV	<i>Programme d'Appui Communauté Villiooise</i>
PCGeDA	<i>Plan Cadre Genre et Développement Agricole</i>
PEGRN	<i>Projet Elargi de Gestion Ressources Naturelles</i>
PNIR	<i>Programme Nationale des Infrastructures Rurales</i>
PPGF	<i>Projet Piscicole de Guinée Forestière</i>
PRSP	Poverty Reduction Strategy Paper

PVO	private voluntary organization
SNAPE	<i>Service National d'Aménagement des Points d'Eau</i>
SNPRV	<i>Service Nationale de Promotion Rurale et de Vulgarization</i>
SNSA	<i>Service National Statistics Agricole</i>
SOGEPAM	<i>Société Guinéenne d'Exportation des Produits Agricoles et Miniers</i>
SPCIA	<i>Société de Production et Commercialisation d'Entrants Agricole</i>
UK	United Kingdom
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WARDA	West African Rice Development Authority
WTO	World Trade Organization

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EXECUTIVE SUMMARY

The primary purposes of this assessment were to:

- ✓ Obtain up-to-date information related to the agricultural sector and assess the magnitude of its contribution to poverty reduction and economic growth in Guinea;
- ✓ Carry out an in-depth analysis of key agricultural sub-sectors to identify their constraints, opportunities, and potential interventions for development; and
- ✓ Identify a number of areas where and how possible future USAID interventions in agriculture in Guinea can most effectively contribute to Guinea's economic growth (especially through sustainable agricultural development, rational resource management, and enterprise development).

The Guinea Agricultural Sector Assessment (GASA) Team views the purposes stated above as a charge to provide a “blueprint” for restarting and reshaping sustainable agricultural productivity that is inextricably bound to poverty reduction targets in Guinea. USAID/Guinea will soon design its five-year country strategic plan (2006-2011) and the contents of this assessment should provide significant analysis and recommendations for consideration in developing the country strategic plan. Through the USAID/Guinea Mission leadership, the Assessment Team is confident that progressive efforts will be made to raise the profile of rural development programs through good governance and income generating activities that are targeted towards reaching Guinea's rural poor in a sustainable manner.

The Current Situation in Guinea

Guinea's agricultural sector growth is inextricably bound to macroeconomic progress in the country. During the past 10-year period (1992-2002), overall economic performance rose, but not high enough to spur increased investment in the productive sectors. Poor economic management is the primary reason for high inflation, increased indebtedness, and increased deficits in balance of payments. Despite some improvement in raising the economic bar in Guinea from the bottom of the United Nations Development Program (UNDP)'s 1984 standard index to 157 out of 174 countries in 2003, the vast majority of Guinea's poor still live in rural areas. Any future strategy designed to assist Guinea's agriculture sector must take a pro-poor approach by recognizing at least for the time being, activities funded by most donors will most likely receive only low to moderate investments and support from Guinea's central government. Guinea on one hand is fortunate to have a well-endowed natural resource base, and on the other hand is unfortunately in lacking effective production and marketing programs to fully exploit this vast potential. Guinea has a virtually “risk free” agricultural sector with its abundant rainfall and arable land suitable to a wide variety of agricultural production systems.

The agricultural policy framework (see *Lettre de Politique de Développement Agricole* [LPDA II]) for productive investment and the inventory of extendable, improved technologies appear to be well conceived, but the good governance procedures and administrative discipline required to implement these plans show no signs of improvement. In the early 1990s there was some encouraging momentum towards market integration in Guinea's agricultural sector, but by the late 1990s, habits of arbitrary interference with that market had reasserted themselves to the point of the present virtual stagnation. While Guinea's flagship agricultural export, bananas (38% of world market share at independence), died in the 1970s, pineapples continued as an important rural income source into the 1980s. In the early 1990s, cotton and coffee began coming back, but as of this assessment, exports of both of those commodities has for all practical purposes ceased altogether.

In spite of this low-to-moderate support for rural sector development, growth in the agriculture sector has still averaged over 4% during the past five-year period (1997-2002). Unfortunately, however, except for

the exceptional revival of “back door” potato and onion exports from the Fouta Djallon (to Senegal), this growth can almost entirely be attributed to the accelerating deforestation of hillside land (*les coteaux*) for rain-fed rice production. Thus, this marginal “growth,” while still outpacing population growth (2%), cannot be sustained. Both agricultural growth and food security in Guinea will, sooner rather than later, require a drastic land-use change wherein annual food crop production is brought down off of these eroding hillsides and into irrigated bottomlands and river plains. In addition to proving this assertion, this report attempts to lay the analytical groundwork for engineering this pattern of sustainable intensification of Guinea’s rice sector. Even if homegrown rice is barely half of Guinea’s calorie intake, for both geographic and historical reasons, food policy and agricultural development follow the fate of rice.

Sustainable Agricultural Production and Poverty Reduction

The new, agency-wide agricultural strategy seeks to link producers to markets, not only to encourage production increases, but also to improve rural incomes.

Strategic Theme : Expanding Global, Regional and Domestic Trade Opportunities and Improving the Capacity of Farmers and Rural Industries to Act on Them.

The GASA Team recommendations fall squarely in line with this market linkage priority. But market linkages, especially in Guinea, do not just evolve when constraining policies and practices are removed. These linkages require good commercial governance but they also have to be build upon:

- maintained infrastructure,
- sustainable land management incentives,
- adapted cropping technologies, and
- outside investors prepared to assure the requisite vertical integration.

Consequently, this report recommends long-term investments that will provide a continuous level of technical and institutional support towards sustainable agricultural production and commercial policy level development. Improved rural governance, favored by the decentralization advocated in Guinea’s Policy Reduction Strategy Paper (PRSP), can:

- foster commercial transparency,
- mobilize some of the recurrent costs for infrastructure maintenance,
- leverage the tenure security of land improvers, and
- legitimize the outreach initiatives of producer organizations.

But the PRSP leaves a big gap in Guinea’s current rural policy dialogue by neglecting those aspects of agricultural market outreach that cannot just happen from the “bottom up,” such as:

- access to appropriate, well-researched technical inputs;
- improved seeds, fertilizer, and crop protection alternatives;
- access to market and outside investor information; and
- legal protection for commercial transparency for both investor and export transactions.

As long as the current PRSP is used to guide donor decision making for the rural sector, agricultural intensification, and, therefore, rural poverty reduction will not be getting the requisite “top down” support. The PRSP document refers these agricultural policy questions to the agricultural development policy letter still in force, the LPDA II. But since the Government of Guinea (GOG) and the Bretton Woods institutions approved Guinea’s PRSP in 2002, donor coordination around the LPDA II has ceased. This GASA, therefore, endorses the request of the *Ministere de l’Agriculture, de l’Elevage, et des Forets*

(MAEF) that USAID join the French in leading the other donors back towards the articulation of an enforceable LPDA III.

The Enabling Environment and Key Assumptions

This LPDA III exercise, as implemented, will have to alter Guinea's rural poverty reduction policy agenda if Guinea is to meet the partnership requirements of the new, agency-wide agricultural strategy:

Ideal partners for USAID-supported agricultural development efforts will be those countries that have put in place policies that encourage greater agricultural productivity and sound environmental management, infrastructure that enables markets to work efficiently, research institutions that assure a flow of new and adapted technologies to producers, and education and information systems that support investments in human capital and put producers and agribusiness in touch with information they need to be effective market participants.

There is *no* geographical or geopolitical reason why Guinea could not or should not be induced to meet this USAID agricultural partnership criteria. It is thus important that USAID/Guinea and other donors in the agricultural sector work closely with the GOG and Guinea's agricultural producer associations to develop market-oriented production that can expeditiously be linked up to a global trade and investment network. The upcoming LPDA III consultations provide a fortuitous "learning-together" opportunity through which an adequate agricultural outreach agenda could be established.

The proposed agricultural policy reform dialogue in this LPDA III consultation cannot be one-sided. While the US has some tantalizing possibilities to offer through the African Growth and Opportunity Act (AGOA) framework, its recent trade and development decisions concerning cotton marketing, for example, also need to be brought to this LPDA III table. On the Guinea side, an example of an egregious policy failure is the recent establishment of an agricultural exporting monopoly, the *Société Guinéenne d'Exportation des Produits Agricoles et Miniers* (SOGEPA). SOGEPA now severely restricts competition in the marketing of small farmer's crops and therefore limits the impact of any effort to raise small farmer incomes.

Summary of GASA-proposed Program Orientations (the "Big Four")

1. Investments, based upon enforceable land tenure contracts and public lands co-management protocols, in natural resource management (NRM) and the sustainable intensification of agriculture;
2. Extension, through producer organizations, of improved cropping practices and farm-level support systems including local and regional market development;
3. Collaborative policy development (see LPDA III), market information, land-use monitoring, and project evaluation programs; and
4. Negotiation, and when appropriate, implementation of a risk-free agribusiness investment promotion agenda.

Targeted Interventions

Rice under Sustainable Production Systems

Guinea's current food security policy sets rice self-sufficiency (and even the promotion of eventual rice exports) as its objective. This priority, particularly when accompanied by hardly any investment in irrigation infrastructure, encourages an inefficient use of resources (hillside rice) in an open economy such as that of Guinea. Yet, rice self-reliance, particularly for the farm family, must still remain a foundation for the cash crop competitiveness of the farm enterprise. Therefore, rice production under

intensive (though not always high input) production systems must be developed. Currently, most rice (65%) is being produced in upland areas, contributing to environmental degradation as hillsides better adapted to tree crop production are eroded. The farmers' time, labor, and other resources are providing meager yields and are subjected to the vagaries of weather, birds, and other pests. At the same time, a number of sustainable rice production alternatives exist. High rice yields can be maintained on level bottomlands, while fragile hillside land can be better protected by perennial tree crops or managed grasslands. Such land-use alternative systems should be promoted. Farm families with land tenure access to only lower-value hillside land would have to be given equitable, long-term contracts to the improved bottomland. Another workable solution to move landless poor from marginal lands would be their equitable access to irrigated bottomlands through secure land tenure contracts.

Other Rural Infrastructure

This same quid pro quo should apply to the range of local infrastructure being made available to rural communities, or *Communautés Rurales de Développement* (CRDs), through the World Bank's flagship project in Guinea, *Programme d'Appui Communauté Villiogoise* (PACV). Funding preference under PACV should be given to sub-prefectures where rural communities are deliberating trying through long-term land tenure contracts to get poor farm families out of their slash-and-burn hillside rice survival system, down onto improved, irrigated bottomland. PACV is already a focus of rural poverty reduction efforts for several donors. By linking it to USAID's (and perhaps LPDA III's) land-use change agenda, even more donor money could be expected to rally around the process.

Aquaculture

Pond systems for tilapia and other species constructed in "*bas fonds*" (lowland), small-scale community systems as part of the overall strategy of intensifying production provides fresh fish to the ready markets in rural areas. Intensive production systems have proven profitable in the *Projet Piscicole de Guinée Forestière* (PPGF) pilot project. In addition to providing high-quality protein to the rural populations and income to producers from the fish sales, many ponds are adapted to intensive transplanted rice production with no other inputs and without compromising fish production and income from pond-side sales of fish. The PPGF model of offering assistance in developing aquaculture and limiting its assistance to communities willing to enter into contracts supporting aquaculture development should be followed in selecting communities in which to work.

Bas fonds Vegetable Crops

Market-oriented vegetable production has become a major source of income for small farmers (particularly women) in all parts of the country. Much of the production is carried out in *bas fonds* during the dry season. Focused on product sales, the revenues provide for family food security during months when food reserves are scarce or non-existent, allowing families to purchase much-needed food. The main vegetables grown include onions, potatoes, tomatoes, eggplant, fresh maize, and fresh peppers. Sales are oriented to the markets of Conakry and other cities and towns as well as to exports to Senegal (particularly the huge Dakar market), Guinea-Bissau, and the Gambia, and with the coming of peace, to Sierra Leone and Liberia as well. Investment in improving *bas fonds* with better fencing and improved water control will allow intensive dry-season vegetable production after a rainy season crop of rice and will make the use of the land in crop production possible year round, thus raising farm incomes.

Mango Production for Export

The Assessment Team noted that Guinea's comparative advantage in mango production is reduced by the lack of cold storage, the high cost of packing materials and sea container rates, and inefficiencies at the port. Guinea mangos are finding their way to Europe either directly from Guinea, or through Mali's

mango export system, with the assistance of the agricultural marketing association, *Agence pour la Commercialization Agricole (ACA)*.

Cashew Production

Commercial cashew production is occurring spontaneously as well as being promoted by various projects. Current programs involve a package of technology and farmer organization support with a component for small-scale processing operated at the village level. More importantly, cashews serve as an alternative activity to hillside rice cultivation and address gender dimensions in the agricultural sector by productive employment for women in cashew processing.

Small Farmer Oil Palm

Annual vegetable oil imports have averaged over 19,000 metric tons (MT) in recent years, and palm oil prices have risen dramatically in recent months. Exports to neighboring countries are thought to be about 9,000 MT per year at present while price differentials favor additional export sales. Small farmers account for 80% of oil palm production. Thus there is a tremendous potential for increasing small farmer incomes, improving nutrition, and enhancing food security through programs supporting the spontaneous increases in small farmer palm oil production already taking place.

Human Resource Development

Technical Training

Efforts must be made to strengthen local capacity for integrated management of agricultural and NRM operation. While there is considerable progress being made in the Enlarged Natural Resources Management Program funded by USAID/Guinea, more attention is needed for sustainable agricultural production constraints dealing with technology improvement through adaptive research, input technology and distribution, cooperative development (marketing), and infrastructure planning.

Support to Rural Organizations Management and Development Programs

The GASA Team was highly impressed with the quality of technical and policy leadership in a number of private voluntary organizations (PVOs) working in the rural sector. A program to build human and institutional capacity in rural areas will enhance the ability of groups to manage activities related to improvements in cultivation technology, adaptive research, market development, and information systems.

Long-term Training for Key GOG Positions

Monitoring and evaluation of poverty reduction economic data and indicators require specialized technical knowledge in a number of areas. USAID/Guinea should consider long-term support to the GOG Office of Planning and Programs to develop capacity to plan and assess the real impact of rural sector economic growth on poverty reduction. Planning capacity is also required to assist both government and private sector entities to evaluate investment options in the rural sector. Similar long-term support for a selected corps of professionals in an agricultural statistics unit is needed to provide a solid basis for agricultural planning and policy decisions.

Donor Coordination

The GASA Team was highly impressed by the interest displayed by donor representatives invited to participate in both entrance and exit briefings of the Assessment Team while in Guinea. There are some seemingly intractable positions taken by the GOG in the rural sector. We are highly optimistic that both technical and policy barriers may be reduced through a common agenda and monthly dialogues with

GOG spokespersons. We urge that the Food and Agriculture Organization (FAO), seconded by USAID/Guinea, serve as the secretariat for frequent donor meetings for sharing information, strategic planning, evaluations, and resolution of constraints/issues in the rural sector. In sum, the GOG and donors need to restart their partnerships to raise the profile of rural development programs as the key to economic performance and poverty reduction.

Current USAID/Guinea-funded Activities Worthy of Continued Support

Food Security DAPs

Current programs being implemented by Opportunities Industrialization Centers International (OICI), AFRICARE, and the Adventist Development and Relief Agency (ADRA) are providing valuable technical assistance in agricultural production, food preservation, and enterprise development in Guinea's food insecure areas.

Microfinance

PRIDE and the Cooperative League of the USA (CLUSA) programs should be continued and expanded to coordinate with private sector entities that provide marketing services to producers. The GASA Team found that microfinance programs currently operating in Guinea continue to be critical in increasing agricultural productivity and income generation which are key elements towards poverty alleviation.

Co-management of Natural Resources

The technical assistance programs managed by Winrock International should be continued and expanded to include an aggressive program that will provide alternatives for hillside rice production systems and extension of its co-management programs to other regions in Guinea. Co-management should be expanded from forestry to include water bodies and fisheries.

Activities of High Interest for the Government of Guinea

Investment in Irrigation

Guinea's irrigation potential is enormous and provides a medium to address upland degradation problems with hillside rice cultivation practices by moving marginal rice producers from hillsides to more fertile lands. Guinea irrigation land potential is estimated to be 364,000 hectares (ha), and of this amount, approximately 28,500 ha are fully developed and 52,778 ha are partially under managed systems. While current policies are to develop irrigated lands in favor of rice cultivation, there are other crops that may have greater comparative advantage due to the prevailing world market prices for rice that are more competitive from Asian producers. Focus should be on *bas fonds* systems and improving village-level plains systems, and not on the vast projects of the past.

The GASA Team recommends that USAID, in collaboration with other donors, finance/support an irrigation assessment that examines investment options (public, private), small- and medium-scale systems, and cropping systems. Land tenure and land access issues need to be settled by community contracts prior to investment in irrigation drainage systems to assure that small farmers benefit.

Investment in Rural Roads and Critical Points

Nearly 7,000 kilometers of rural roads were developed under the first *Programme Nationale des Infrastructures Rurales* (PNIR1), and most of these roads are still functional. However, efforts to sustain the rural road networks with organized maintenance programs by rural management councils have not been implemented. The GOG has identified 19 critical points (e.g., the need for bridges to replace ferry

transport across streams). Six bridges have been constructed so far while investment capital is being sought primarily through French and World Bank assistance programs.

There is also a need for assistance in geo-referencing technology to identify critical points as well as additional land suitable for irrigation. Should improvements be made in empowerment of village committees at the CRD level through a continuing PACV program, USAID and other donors could support additional investments that are predicated on infrastructure, enabling policies and governance that are key for rural groups to benefit more from their own active involvement in local affairs. The GASA Team recommends that USAID, in collaboration with other donors, support the development of a geo-referencing entity within the GOG to support multiple rural development programs.

Future Activities pending Favorable Policy and Infrastructure Developments

Ecological Tourism

At kilometer 36, just outside Conakry's city limit, one encounters with a beautiful landscape that would easily attract a host of world visitors if minimal tourist needs were met in Guinea. A large segment of Americans would be interested in the cultural setting, too, and Guinea could offer both cultural and ecological tourism.

Ecological and cultural tourism is not a far-fetched idea since Guinea's neighbors (Senegal, Gambia, and Mali) have such programs in the absence of the striking landscape that Guinea has to offer. The GASA Team strongly recommends that an ecotourism assessment be performed to evaluate options for public or private investment and economic benefits that will accrue to inhabitants of rural villages, tour operators, and the GOG.

Value-added Processing Industries

It is a commonly held fact that Guinea's fruits and vegetable produce are of high quality. To maximize earnings on agricultural produce, there are a number of value-added industries that could be easily managed by private sector entities provided that suitable policies existed to promote and protect agricultural sector investments (e.g., juice factories, concentrates, dried specialty fruits, cooking oils, and cosmetic products). There are some limiting factors that must be overcome to make such investments more viable, such as a reduction in transport costs, an improved energy system (electricity), management training, and market identification.

1.0 INTRODUCTION

The GASA Team was charged with carrying out an in-depth analysis of the agricultural situation in Guinea around the following objectives:

- to obtain up-to-date information related to the agricultural sector and assess the magnitude of its contribution to poverty reduction and economic growth in Guinea;
- to conduct an in-depth analysis of key agricultural sub-sectors to identify their constraints, opportunities, and potential intervention for development; and
- to identify a number of areas where and how possible future USAID interventions in agriculture in Guinea can most effectively contribute to Guinea's economic growth (especially through sustainable agricultural development, rational NRM, and enterprise development).

This assessment validates findings and recommendations in two prior agricultural sector assessments financed by USAID/Guinea and performed by Stryker *et. al.* in 1989 and Erickson *et. al.* in 1997. In the years following the 1997 agricultural sector assessment, the Republic of Guinea met continuing challenges with insecurity on its borders with neighboring countries (Senegal, Guinea-Bissau, Sierra Leone, and Liberia). Guinea is considered the “last man standing” in the sub-region. Guinea's domestic economy since fiscal year 2000 stagnated due in part to the security situation in the sub-region, but most prominently due to economic mismanagement. Continuing problems in domestic governance led to the premature closure of several important rural development programs financed in great part by the international donor community. USAID-funded agricultural development programs during that same timeframe were limited principally to sustainable NRM programs as opposed to a traditional sustainable agricultural development tied to a market-driven economy. Other significant events occurred during this period that impelled Guinea and its donors to aggressively enhance agricultural sector productivity for economic growth and subsequent poverty reduction (e.g., World Trade Organization [WTO] Agreement, high-poverty country debt relief, Poverty Reduction Strategy).

Despite macroeconomic and security shortcomings, Guinea's agricultural sector has demonstrated a capacity for growth, although its non-enhanced growth averaged approximately 4% per year from 1999 to 2002. There are few countries of relative size to Guinea that can match its percentage of arable land to the total land mass and water resources on a per capita basis. More importantly, it has great potential for rapid economic growth in view of its mineral wealth, its excellent conditions for agriculture, and its location in West Africa that enhances its comparative advantage for trade to the outside world. Guinea's natural beauty has not been taken full advantage of in terms of revenues that could be generated from both ecological and cultural tourism. This assessment will examine principal income generating possibilities for further analysis when the policy and program environment is suitable for long-term investment opportunities.

In sum, Guinea's agricultural sector holds great promise for fueling economic growth and subsequent poverty reduction. It is the Assessment Team's belief that a new beginning between donors and the GOG is a worthwhile challenge that will clearly provide the impetus of “linking Guinea's agricultural producers to markets.” Market-driven agricultural production is Guinea's only hope for sustainable growth and poverty reduction.

Methodology

In addition to visiting every USAID economic growth project in the rural sector, the GASA Team reviewed at least one agricultural and/or NRM project from each of the other major donors. Furthermore, in order to break the administrative mold of project-based action, the team revisited seven out of the eight

sample villages studied by the Land Tenure Center (LTC) over a decade ago for USAID and the GOG. The LTC community surveys furnished a baseline against which current agricultural aspirations and frustrations as articulated in half-day meetings in each of these seven villages could be measured.

Along the way, 22 of Guinea's sub-prefectures were visited. Policy impacts, cropping combinations, and market integration were reviewed over the course of all of these visits. Both donor and host country policymakers and project managers were interviewed and solicited for elusive documentation wherever possible. The team sought feedback on their emerging recommendations from all parties in the villages and the administrative offices. Those recommendations call for a greater integration of environmental protection, forest co-management, agricultural resource management, and sustainable cropping systems into a comprehensive legal, institutional, and appropriate technology development framework for local participation in governing all four processes. Vertical linkages out, credit, roads, and cash crop marketing need to be fostered by national and regional enabling conditions reinforced by this local institutional involvement and stimulated by a phased and transparent protocol for promoting international agribusiness investment into this rural sector.

2.0 BACKGROUND AND CURRENT SITUATION

2.1 Guinea Economic Performance

Guinea possesses major mineral, hydropower, and agricultural resources, yet remains one of the poorest countries in the world, placing 157 out of 173 countries ranked by the UNDP. The country possesses over 30% of the world's bauxite reserves and is the second largest bauxite producer. The mining sector accounts for about three-quarters of exports. Regional conflicts have caused major economic disruptions. In addition to direct defense costs, the violence has led to a sharp decline in investor confidence. Long-run improvements in government fiscal arrangements, the trade environment, and anticorruption efforts are needed if Guinea is to move out of poverty.

Agriculture accounts for 24% of Guinea's gross domestic product (GDP), industry (including mining) is 38%, and services are 38%. The labor force is estimated to comprise three million persons, with 80% of those occupied in the agricultural sector. Exports include bauxite, alumina, gold, diamonds, coffee, fish, and other agricultural products. Belgium, the United States, Ireland, and Russia are the major export destinations. Imports include petroleum products, metals, machinery, transport equipment, textiles, grains, and other foodstuffs. The major sources of imported goods are France, the United States, Belgium, and Côte d'Ivoire.

There is no recent poverty profile of Guinea, but in 1994/1995, some 40% of the population lived in conditions of abject poverty (surviving on \$1 per day or less). Subsistence farmers are the worst off, comprising some 50% of the population, but 68% of the poor. The population in 2002 was 7.7 million. Infant mortality in 2000 was 105 per 1,000 live births; malnutrition affected one-third of children under age five; and with a population growth rate of 2.7% per year, the population was projected to double within 20 to 25 years.

A July 2000 survey concluded that 4.4% of pregnant women were HIV positive, although estimated infection rates were 7% in the Guinée Forestière (a war-ravaged region). The gender incidence of HIV has dramatically reversed: In 1989, only one woman was infected for every eight men; by 2001 two women were infected for every man.

There has been a recent fall in per capita gross national income according to the World Bank (Country Assistance Strategy, June 2003), from \$450 in 2000 to \$410 in 2002. Factors influencing this decline include depreciation of the Guinean franc (FG), a decrease of 42% in external assistance, and an increase in private transfers to foreigners (including capital flight) of 23%. A recent International Monetary Fund Mission (September 2003) projected that real GDP per capita would fall by 1% in 2003. It also cited a "galloping" inflation rate of 16.1% on an annualized basis, observed in June 2003, far in excess of targeted levels and provoked by expansion of the monetary base in the money supply to cover an expanding fiscal deficit. Continued fiscal deterioration was projected to have caused the global budget deficit to exceed the GOG's target by an estimated 1.2% of GDP in 2003.

After initial achievements in the transition to a market-oriented economy in the mid-1980s, Guinean progress in economic reform was "stop-and-go." Completion of IMF macroeconomic stabilization programs was problematic, and growth was uneven; dependence on external concessional donor flows intensified. During the 1990s, Guinea became a heavily indebted poor country (HIPC). Concern has risen within the donor community about poor governance and corruption. Illegal trade in precious minerals and gems also is a problem.

Several key indicators of Guinean macroeconomic performance and economic viability during the 1990s and early 2000s are presented in Table 1. They show that the period was characterized by per capita GDP growth rates that were insufficient to reduce poverty; persistent inadequate domestic fiscal resource mobilization and continued external imbalances; steadily rising external donor dependence; and the accumulation of an unsustainable debt burden, despite progressively softer external borrowing terms and substantial grant assistance, culminating in external debt forgiveness.

Poor fiscal performance has aggravated Guinea's continued dependence on foreign grants and concessional loans. Rationalization of the civil service and public expenditure reform continues to be a priority problem. The legal and institutional environment for private sector development remains poor. Persistent and grave external resource gaps; weak public expenditure control; an overstaffed, inefficient civil service; and an unsatisfactory and ineffective incentive framework to promote the development of the private sector have impeded sustainable economic growth.

A recent review of performance in the context of sequential World Bank structural adjustment loans to Guinea since 1990¹ concluded that both bank and borrower performance during the period were unsatisfactory. Guinea moved from the status of "low multilateral debtor" to "high multilateral debtor" in 1993. During the period 1987-2002, the World Bank's IDA disbursed approximately US\$1 billion to Guinea. Nevertheless, IDA's economic reporting and risk assessment practices did not identify the impending debt sustainability issue in a timely manner, and the country strategy presented to the board in 1997 did not highlight IDA's rising exposure or the likely need for IDA debt relief. In November 2000, the bank's board approved \$234 million of IDA debt relief to Guinea.

Table 1. Selected Macroeconomic Indicators, 1989-2002

	1989	1990	1991-1995	1996	1997	1998	1999	2000	2001	2002
Real Per Capita GDP										
1995 \$	527	534	538	572	585	598	605	603	607	N/A
Growth (%)	1.0	1.4	1.0	2.0	2.3	2.2	1.3	-0.3	0.7	N/A
Inflation (av. annual % change in CPI)	28.3	19.4	10.6	3.0	1.9	5.1	4.6	6.8	5.4	3.0
Overall budget balance (commitment basis) as % of GDP										
Including grants	-5.0	-5.2	-3.6	-3.0	-2.9	-0.7	-3.0	-3.2	-4.1	-5.9
Excluding grants	-8.7	-7.4	-8.8	-6.1	-5.9	-3.6	-5.4	-5.6	-7.2	-8.2
External current account balance as % of GDP										
Including official transfers and grants	-4.9	-5.6	-5.5	-4.4	-3.1	-2.6	-4.2	-2.9	-2.4	-6.1
Excluding official transfers and grants	-8.9	-9.5	-9.1	-7.3	-6.3	-6.0	-7.2	-6.5	-3.8	-7.5

Source: World Bank, OED, 10/31/03.

2.2 Guinea Government Objectives

Guinea's strategic objectives are intertwined within its PRSP that is designed to improve the living conditions and prospects of the population with an accent on addressing the needs of the poorest segment of the population. The PRSP has three broad pillars:

- fostering sustainable and equitable growth,

¹ The report was completed by the Bank's independent Operations Evaluation Department (OED), 10/31/03. See http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2003/11/12/000112742_20031112161913/Rendered/PDF/27166.pdf

- improving access and quality of basic social services, and
- strengthening governance and institutional and human capacity.

If Guinea is to succeed in poverty reduction, it must move rapidly to improve the investment climate that appears to be on the decline (oligarchy tendencies) due in part to issues of good governance. The World Bank cites the need for a stable macroeconomic and financial environment; improved access to basic infrastructures (specifically electricity, water, and transportation); and a strengthened institutional, legal, and regulatory environment.

The vast majority of donors consulted during our investigations agree that achieving Guinea's third objective (strengthening governance and human capacity) is *sine qua non* important for achieving the first two objectives. Strengthening governance at the "grassroots" level appears to be the crux of the issue centered on decentralized governance. The highly centralized and interventionist public sector heightens the governance challenge. For instance in November 2001, a referendum was approved by Guinea's electorate that was viewed as a complete reversal of earlier laws on decentralization and the roles of municipalities as the fundamental decision centers in local government. The notion of devolving aspects of planning, program management, and implementation closer to end-users was seemingly reversed by this legislation. The World Bank cited some progress in Conakry with improvements in allocation of local revenues between the government of Conakry and its municipalities that appear to be contributing to greater financial autonomy of the local municipalities. Similar financial management policies are required for Guinea's 33 prefectures managed by CRDs.

2.3 Donor Programs in Guinea

Nearly all donor-funded programs are linked to achieving objectives in Guinea's approved PRSP:

- The World Bank's** programs focus on policy dialog; structural reforms; privatization; administrative decentralization; capacity building; sector programs in the priority areas of health, education, rural development, road maintenance; and a program in anticorruption.
- The International Monetary Fund** is addressing poverty reduction by assisting the GOG to effectively address a macroeconomic quantitative target, which includes public debt supervision, tax administration, banking supervision, currency reforms, and microfinance. The IMF has assisted the GOG to establish benchmarks in areas of revenue and expenditure tracking management and money laundering. Guinea's HIPC agreement calls for strict tracing of expenditures, especially those target toward poverty reduction programs.
- The UNDP's** principal focus in Guinea is to implement programs to achieve the Millennium Development Goals that include an overarching goal of reducing poverty by half by 2015. Current programs in Guinea address democratic governance, poverty reduction, crisis prevention and recovery, energy and environment, and HIV/AIDS. The UNDP programs in Guinea are assisting the GOG to attract and use aid effectively, and they promote integration of information and communication technology for development into the work of democratic governance and poverty reduction. UNDP finances "*radio rural*" in several prefectures in Guinea. It is the only multilateral agency that promotes the protection of human rights and the empowerment of women.
- UNICEF's** program focuses on decentralization that favor access to basic social services for women and children. It also supports data collection and information on the situation of women and children in Guinea. In view of Guinea's recent problems with instability on its borders, UNICEF's country office in Conakry has developed a program capable of emergency response. UNICEF's core health program supports capacity development of national health workers managing malaria, acute respiratory infections, and diarrhea as part of the Integrated Management of Childhood Illnesses (MCI) initiative. They also are responsible for carrying out the national

immunization campaigns that are significant for the health of families in rural areas. UNICEF implements water, environment, and sanitation programs that encourage participation of communities in monitoring and managing water points, which are key elements in rural development.

- e. **The FAO** focuses principally on food security as part of its worldwide agreement to cut hunger by 50% in 2015. Financial resources invested are directed towards strengthening rural farmer organizations, water management and sustainable natural resources management. The FAO uses its multilateral agreement with the GOG to implement projects funded by other donors in the agriculture sector (e.g., vegetable cropping systems, fisheries, cooperative development, statistical studies, and analyses).
- f. **French Cooperation (Agence Française du Développement [AFD])**'s active development portfolio in Guinea exceeds \$199 million and covers a wide range of development activities ranging from the classical rural development programs, urban development, infrastructure development (roads, hydroelectric, water), finance, budget support and microfinance. The agricultural sector's share of the total investment is approximately \$85 million and focuses on rice production, livestock production, microfinance, rural governance, rural organization development, rural water systems, and artisan fisheries. AFD's microfinance programs, intensive rice production projects, artisan fisheries activities and rural organization development programs have achieved measurable success in Guinea.

Other donors involved in the agricultural sector are International Food for Agricultural Development (IFAD), Islamic Development Bank, the European Union, Japanese International Cooperation Agency, German KFW, and the Canadian International Development Agency.

2.4 Lessons from the Past

The most notable description of Guinea's past performance has been uneven or erratic. Guinea has benefited from four structural adjustment agreements. Examination of the results of each agreement shows the most notable progress achieved during the 1990s in nearly all of its sectors, but the most notable improvements are in water and electricity. There were also notable investments in both the social and productive sectors during this period. While social investments have been retained at growing levels, investments in the productive sectors have declined in part because of a poor investment climate due to some extent to mismanagement of macroeconomic structural adjustment programs.

Guinea's political environment, governance, and regional stability appeared to decline during the late 1990s after a multiparty system was set in place in 1991. The multi-party presidential election 1993 held much promise for the Second Republic, however, the initial election was judged by international observers as flawed. Subsequent elections in 1998 and most recently in December 2003 have gone without significant participation of the opposition. One positive feature occurred in 1994 when Guinea's government permitted an independent press in spite of continuing restrictive policies that keep radio and television under the control of the central government. There were also other apparent negatives associated with the imprisonment of one of the opposition leaders and the national referendum in 2002 to amend the constitution that eliminated term limits and age restrictions for the sitting president.

There has been some improvement in the priorities and qualities of public expenditures but there is clearly much more room for improvement. The data examined demonstrated allocations in the priority sectors education and health is on the increase from 1997 to 2002. The same grade cannot be attributed to Guinea's progress under the enhanced High-poverty Country Initiative Agreement that should have seen more investments in the productive sectors. In May 2003, principal donor representatives sent a formal letter to the Minister of Economy and Finance noted their concerns that Guinea's agreement for debt reduction especially financial and budget procedures were not being implemented in a transparent

environment. They admonished the GOG to engage mandatory national institutions in transparent financial management (e.g., National Assembly, Supreme Court, and State Financial Inspection Unit).

Guinea clearly needs a new start with its bilateral and multilateral development partners. They are concerned with the 2002 referendum and parliamentary elections, transparency in local governance, corruption, and most importantly “backsliding” on appropriate policies that will increase trade and development, the primary engine for poverty reduction.

3.0 ANALYSIS OF AGRICULTURE SECTOR STATISTICS (1992-2002)

3.1 Crops

The Assessment Team was fortunate to receive the most recent raw data distributed during the initial debriefings on Guinea's agricultural census exercise completed in June 2003. We understand that concerns were expressed about the accuracy of surveys conducted (estimation of sampling error) and whether data reported in some key crops reflect the true level of production. There was a consensus of opinion by GOG officials at the debriefing that regional results are credible to the prefecture level. SNSA claims that the national error was estimated to be 5% and regional error to be 10%. The sampling error on these data appears to be good, but at small levels (prefectures and below), error is higher. Therefore, our analysis on the evolution of crops will refer to information in national-level and regional tables (Tables 4, 5, and 6).

During the past seven-year period, crop production increased gradually each year (Table 4). Cotton production increased nearly eightfold and mango production increased threefold. Production increases in several crops (sorghum/millet, peanuts, yams/taro, potatoes, oranges, and cocoa) doubled during the same period.

Some verbal reports noted that cotton production following privatization of the industry has sharply declined, though decreased production levels are not substantiated by current data. In that regard, the Assessment Team noted that the *Service National Statistique Agricole* (SNSA) is severely underfunded to carry out its necessary tasks, as are other Ministry of Agriculture line agencies. The Assessment Team strongly recommends long-term assistance to SNSA to strengthen capacity for improved data collection and to establish and maintain a data system that could contribute to more accurate results needed by the *Bureau Central des Etudes et de la Planification Agricole*. The *Bureau* is expected to play a larger role under the upcoming LPDA III on establishing and monitoring of poverty reduction indicators.

3.2 Livestock

Livestock production in Guinea is the source of income for the livelihoods of approximately 5% of the active rural population. Livestock production contributes to roughly 10% of the GDP. It is a subsector that has clearly evolved since 1987 after the first restructuring of the national service to provide greater service to herders through technical interventions (vaccination programs, improved marketing). In 1996, as part of a new policy of under LPDA II, the subsector was reorganized to:

- restructure services on a regional basis as opposed to a traditional set of activities carried out nationally,
- create a livestock producer organizations around economic production themes, and
- establish private sector inputs and delivery systems.

The Assessment Team received mixed reviews on the impact of these changes in the every day lives of herders and their families. In the Fouta Djallon (Moyenne Guinée), herders often complained of insecurity and the lack of private veterinary coverage within the countryside of Moyenne Guinée. They acknowledged the fact that certain private veterinary services could be available if herders would transport sick animals to the urban sites. They noted the difficulty in transporting sick animals to urban areas for treatment. In urban or peri-urban areas, private veterinary services are available and the cost of these services and pharmaceuticals are high relative to the market value of livestock products in the market place. Factor costs for livestock production must be reasonable enough for herders to afford and they contribute to productivity increases that will serve regional and international markets. Significant growth has been recorded among all livestock and poultry groups since restructuring the industry.

Table 2: Livestock Sector Statistics

	1996	2003	% Increase
Cattle	2,317,000	2,984,000	29
Small Ruminants	1,427,000	1,948,000	37
Swine	48,000	58,000	21
Poultry (village)	9,958,000	12,566,000	26
Poultry (commercial)	137,600	715,000	419

Source: Rural Sector Expense Survey, August 2003

A large share of the increases in production as noted above is due to privatization of the subsector. From the Assessment Team's investigations, it is quite clear that the livestock sector benefits from relatively little intervention from the government. There are over 11,800 auxiliary agents working in the livestock subsector and five private sector operators have been issued licenses to improve livestock inputs. Over 42 private veterinary shops service the sector, 13 new slaughter houses are operating, and three additional livestock markets and 10 butcher shops have been added for urban markets. The most significant accomplishments tie producers and commercial operators with world markets was the establishment of a guarantee fund (FG 100 million) to pay for imported veterinary inputs by the European Union (EU). Vaccine sales, medications, and feed additives offer numerous Global Development Alliance (GDA) opportunities for American private sector entities in Guinea. The Assessment Team strongly recommends a subsector analysis to examine commercial feed production and sales that could channel surplus grains and other agricultural by products into sustainable livestock feed industry. For example, increased market demand for corn production would benefit subsistence farmers in Guinea's high-poverty zones (Dingueraye, Siguiiri, and Mandiana).

3.3 Market Quantities

In Table 6, the total value of crops produced and sold in Guinea during the past seven-year period are listed. In 2000, market statistics show that rice is by far the preferred or basic agricultural product in Guinea and accounts for nearly half of all revenues received for all crops sold that year. Cassava and peanuts were the second and third crops in terms of value while pineapples, bananas, and coffee (exportable crops) were in the fourth, fifth, and sixth places in revenues generated. Table 5 shows the prices returned to producers over the five-year period 1995-2000. It is significant to note that mango production yielded the highest return per unit (200%) over the five-year period while the returns to coffee production decreased by 17%. It is clear from these accounts that for agricultural produce not subject to marketing through the port of Conakry, returns to producers are higher than those products marketed through cartels operating at the port (e.g., SOGEPAM).

3.4 Inputs

Outside of the livestock subsector, there are no reliable or sustainable source(s) of farm inputs in Guinea. The Assessment Team has highlighted in other areas of this report the demand for chemical fertilizers, pesticides, equipment, and other laborsaving tools that will contribute towards greater agricultural production in an environmentally stable fashion. Concurrent training and informational programs must be instituted with increased importation of chemicals that facilitate training for farmers and commercial operators on the appropriate use of inputs such that export produce is not constrained by inappropriate or excessive uses of inputs. Very few of the modern inputs used in the rural sector in Guinea are manufactured in Guinea. A sustainable system of input supply and service must be woven into the commercial marketplace through regional markets that serve as a bridge to international markets such as Senegal, Mali, and Liberia. The next level of development would be linkages directly to the international markets. In the upcoming discussions in LPDA III, input supply and services should be a priority for

policy support from the GOG. LPDA III must place a premium on removal of barriers to entry/exits of inputs in the market place. A renewed commitment is needed to promote input supply and services would contribute to the overall goal of improved trade regimes with emphasis on policy liberalization that clearly link producers to markets.

3.5 Geology, Land Use, and Meteorology

Guinea is by far ahead of most of its neighbors in mineral resources. Exploitation of mineral resources have not always channeled investment capital to rural sector development activities and the bulk of future investments will most likely depend on generated income in the rural sector. The GASA Team noted ongoing rice contracts between ALCOA (a bauxite mining conglomerate) and local producers. Local procurement of certain agricultural products increases marketing options for small-scale producers. The development of iron ore mining industry by Rio Tinto would likely promote local market linkages and sustainable rural sector performance. Land-use issues must be resolved in a fashion that increases land holdings, agricultural productivity increases, increased incomes, and poverty reduction in the rural sector. A new land code was adopted in March 1992 and subsequent laws have been enacted to move to community-based tenure systems that respond to expanding markets conditions and demographic pressures. It is incumbent upon the GOG to devolve to local-level land commissions within the CRDs the authority to interpret the national code and monitor land tenure contracts. Management of the natural resource base is key to economic growth including incorporation at some point in Guinea's economic programs, ecological tourism. There are simply no shortcomings with meteorological conditions in Guinea. In Table 3, the lowest rainfall recorded is 1,200 mm/year in Moyenne Guinée. That rainfall level represents the median or highest level of rainfall in almost of Guinea's northern neighbors and several countries in central and east Africa. Guinea has virtually a "risk free" agricultural sector when rainfall is considered as the major limiting constraint to increased productivity.

Table 3. Rural Sector Statistics

Region	Density hab/km ²	Area Km ²	Rainfall (mm)	Cultivable Land (ha)
Guinee Maritime	21	44,300	2,000-4,000	217,000
Moyenne Guinee	25	55,500	1,250-2,000	2,000,000
Haute Guinee	17	96,700	1,300-1,700	328,000
Guinee Forestiere	19	49,400	1,700-2,500	191,000

Table 4. Evolution of Agricultural Production from 1994 to 2002 (in MT)

Products	1995 ^(U)	1996 ^(e)	1997 ^(U)	1998 ^(e)	1999 ^(e)	2000 ^(e)		2001 ^(e)	2002 ^(e)
						Before flooding	Afrer flooding		
Rice (o)	630,511	673,070	715,649	763,955	815,522	870,570	739,341	789,247	842,521
Maize (o)	79,275	82,335	85,393	88,690	92,113	95,669	95,441	99,126	102,952
Fonio (o)	103,026	106,941	110,860	115,073	119,445	123,985	123,364	128,053	132,919
Millet/Sorghum (e)	12,518	13,916	15,469	16,802	18,043	19,376	19,376	20,807	23,994
Peanuts (o)	132,081	145,091	158,076	173,682	190,790	209,582	205,780	226,050	248,316
Cassava (o)	601300	666,721	775,600	811,869	900,200	998,142	925,447	1,026,136	1,137,779
Sweet potatoes/Taro (e)	42,000	45,108	48,445	57,255	63,484	70,391	70,391	78,050	95,958
Yams (e)	21,600	23,198	25,000	29,444	32,648	36,200	36,200	40,139	49,351
Potatoes (o)	2,000	2,100	2,235	2,320	2,415	2,514	2,514	2,800	3800
Bananas/Plantains (e)	115,500	122,440	131,020	141,500	150,000	159,011	112,898	119,679	134,489
Mangoes (e)	55,000	76,450	75,000	84,720	95,699	108,100	108,100	122,110	155,812
Oranges (e)	17,000	18,258	19,600	21,246	23,158	25,242	25,242	27,514	32,688
Pineapple (e)	63,034	65,000	67,000	71,858	77,068	82,655	82,655	88,648	101,968
Coffee (e)	24,585	24,535	25,000	26,450	28,513	30,737	21,823	23,525	27,338
Cocoa (e)	6,950	8,000	9,375	10,960	12,801	14,948	10,613	12,395	16,906
Cotton (o)	10,738	14,582	24,700	30,200	36,800	44,482	44,482	53,768	78,559
Palm Oil (e)	41,180	43,660	46,280	49,057	52,000	55,120	39,135	41,483	46,612

Table 5. Evolution in Producer Prices from 1995 to 2000 (in thousands of Guinea Francs per ton)

Products	1995	1996	1997	1998	1999	2000
Rice	310	291	330	342	320	330
Maize	182	239	280	220	288	295
Fonio	382	352	350	310	300	300
Millet / Sorghum	161	180	180	205	258	270
Peanuts	200	212	250	257	280	300
Cassava	109	70	100	140	127	135
Sweet Potatoes / Taro	150	150	175	150	130	140
Yams	300	300	350	273	290	310
Potatoes	340	350	360	400	450	475
Bananas/ plantain	200	220	250	280	260	280
Mangoes	50	60	70	80	100	125
Oranges	75	75	80	100	120	125
Pineapple	150	175	200	230	250	255
Coffee	2,400	1,800	1,800	2,000	2,100	2,100
Cocoa	490	500	520	530	550	550
Cotton	320	350	370	370	380	380
Palm Oil	320	350	380	390	400	400

Table 6. Evolution in the Value of Agricultural Production from 1995 to 2000 (in millions of Guinea Francs)

Products	1995	1996	1997	1998	1999	2000 A.I.	2000 Inc.
Rice	195,458	195,864	236,164	261,273	260,967	287,288	243,983
Maize	14,428	19,678	23,910	19,512	26,528	28,222	28,155
Fonio	39,356	37,643	38,801	35,673	35,834	37,196	37,009
Millet / Sorghum	2,015	2,505	2,784	3,444	4,655	5,232	5,232
Peanuts	26,416	30,759	39,519	44,636	53,421	62,875	61,734
Cassava	65,542	46,671	77,560	113,662	114,325	134,749	124,935
Sweet Potatoes / Taro	6,300	6,766	8,478	8,588	8,253	9,855	9,855
Yams	6,480	6,960	8,750	8,038	9,468	11,222	11,222
Potatoes	680	735	805	928	1,087	1,194	1,194
Bananas / plantain	23,100	26,937	32,755	39,620	39,000	44,523	31,611
Mangoes	2,750	4,587	5,250	6,778	9,570	13,513	13,513
Oranges	1,275	1,369	1,568	2,125	2,779	3,155	3,155
Pineapple	9,455	11,375	13,400	16,527	19,267	21,077	21,077
Coffee	59,004	44,163	45,000	52,900	59,878	64,548	45,829
Cocoa	3,406	4,000	4,875	5,809	7,040	8,222	5,837
Cotton	3,436	5,104	9,139	11,174	13,984	16,903	16,903
Palm Oil	13,178	15,281	17,586	19,132	20,800	22,048	15,654
TOTAL	472,279	460,396	566,345	649,819	686,856	771,822	676,898

4.0 IMPORTANCE OF AGRICULTURAL DEVELOPMENT TO GUINEA'S POVERTY REDUCTION STRATEGY

4.1 Guinea's Poverty is 90% Rural

At the risk of parroting too much of the analysis just completed by F. Bioche *et. al.* (*A.I. et Développement SCRL*, June 2003) for the EU and French Cooperation, we still need to begin this sector review with a comparable query: with all but 10% of Guinea's extreme poor in the rural sector, how can the PRSP's "Strategic Framework for Development of the Rural Sector" (January 2002:74) not mention agriculture?

The strategy has two main aims: more involvement and responsibilities for producers, civil society organizations, and local governments in identifying, implementing, and monitoring development actions; and in enhancing and improving the quality and efficiency of government services.

Presumably taking its cue from this kind of language, the Ministry of Finance (MEF, September 2003:15-16), posits only four (#'s 20-23) of its 62 "first order" poverty reduction indicators anywhere near to the agricultural sector, and only two of these purport to capture any cropping changes:

- 20.) value-added in agricultural production,
- 21.) value-added in fisheries production (N.B. many fewer beneficiaries),
- 22.) value-added in livestock production, and
- 23.) agricultural exports.

The environment, on the other hand, gets almost as many indicators, even though its immediate consequences for any rural income growth can only be more remote:

- 25.) "proportion" of forest zones,
- 26.) biodiversity protection surface area, and
- 27.) number of natural springs conserved.

Among the 62 "second order," or backup, indicators, the cropping sector fares somewhat better (MEF 2003: 18):

- 17.) percent of households producing cash crops,
- 18.) percent of households purchasing agricultural inputs (improved seeds, fertilizer),
- 19.) number of farmers joining organizations ("*encadrements*"),
- 20.) vaccine coverage of livestock,
- 21.) number of hectares of improved bottomlands or river plains, and
- 22.) number of fishing ports built and equipped.

At this level of backup indicators, the environment indicators become more relevant, even if they are reduced to two:

- 23.) number of village-level NRM committees operating, and
- 24.) percent of population cooking with charcol and wood.

Thus, with less than 10% of its indicators tracking agriculture, the PRSP monitoring team will measure the contribution towards national poverty reduction of a third of the Guinean economy and the revenue source for over two thirds of the income earned by three quarters of its households.

This imbalance of emphasis can be traced to the PRSP itself, where safer, more “participatory” (less controversial) institutional targets are emphasized. Passing over agriculture at this level of generality, the PRSP’s rural strategy (2002: 74) focuses in on two rural cross-sector concerns:

- working conditions and income opportunities for women, and
- HIV/AIDS.

With regard to the first, we are reminded in that three quarters of these working rural women produce two thirds of Guinea’s homegrown food with severely limited access to land, inputs, and credit. Nevertheless, these women’s particular concerns are subsumed into the decentralized and male-dominated “civil society” and agricultural service organizations featured among the “key issues,” in the PRSP’s prioritized (coequal with livestock, fishing, and infrastructure) “Crop Farming Subsector” (2002: 76):

1. Rational management of land resources with the close involvement of CRDs;
2. Emergence of a more professional class of private operators to import, distribute, and market products, seeds, and farming tools;
3. Institutionalization of the Support Units for Farmers’ Organizations (CAOPOAs) through sustained financing (sic) for extension and capacity building; and
4. Enhanced role for agronomic research (on appropriate technology, etc.), also through sustained financing (sic).

As this list was being prepared for Guinea’s PRSP (2002), the World Bank terminated its projects covering all but the first of these four “key” issues. And even there, less than a fifth of the PACV funds being channeled through these CRDs (itself only 10% of total PACV dispersal to date) goes directly towards agriculture or natural resources management. USAID also remains in this first issue area, but judiciously works, for the most part, below the CRD level. Perhaps this is why USAID’s ambitious land (“natural resources”) management portfolio is not acknowledged in the PRSP annexes. With respect to the next two “key issues,” French Cooperation supports food output traders and producers through the *Projet d’Appui a la Dynamisation de Filières Vivrières* (DYNAFIV, previously *Programme d’Appui a la Sécurité Alimentaire*) and CAOPOA projects respectively. The Canadians (*Programme d’Appui aux Populations Paysannes*, MG and CECI) and IFAD (PRAADEL, PAPE-BGN) also provide institutional development, more than technical, help to the producer organizations. Now that SCPIA is trying to make ends meet without (very much) donor support, input traders are on their own, unless a CAOPOA, PRAADEL, or PRADEV (CLUSA) association (groupement) obtains financing for an advance order.

As for the fourth “key issue,” expect for some pinch-hitting from the *Centre de Coopération Internationale en le Recherche Agronomique pour le Développement*, Winrock (PEG and *Projet Elargi de Gestion Ressources Naturelles* [PEGRN]) and Sasakawa Global 2000, as links to international agricultural research continue to atrophy. Of the five West African Rice Development Authority (WARDA) varieties that are being adapted to Guinean conditions through some, also atrophying, CGIAR linkages, four were exclusively targeted at rainfed, upland hillside (slash-and-burn) farming conditions (Bayo and Conde 2000:10). Only one (WAB 450 IPB 28 HB) was considered worth testing in bottomlands as an off season crop. However, even with fertilizer it did not outperform the North Korean alternative (CK 73). To the extent that superior new rice varieties are being extended into sustainable intensification target areas, bottomlands, flood plains, and mangrove swamps, most are derived from an ongoing North Korean rice breeding initiative (at IRAG/Kilissi) dating back to the first republic.

It would be too much to say that North Korea, itself more food insecure than even Guinea, is the only “donor” concerned with Guinea’s sustainable food security. But to the extent that sustainable rice production is seen as the food security foundation for sustainable rural income growth, and, therefore, poverty reduction, in Guinea, the rest of the donor cupboard is looking very bare. The French are justly proud of PDRI/Guinée Maritime’s productivity strides with 16,000 ha of low-input mangrove swamp rice. But their PGM3 is more focused on producer organizational objectives, particularly in the fisheries subsector, than even PGM2. Yields on the Arab Fund’s BGSud’s Kabak island mangrove perimeter are not far behind PDRI’s. But this very success is both generating frustration with the slow pace of “*amenagements*” for unimproved mangrove perimeters (more than 70,000 ha worth) in less well-connected coastal villages, and serving as a pretext for the neighboring EU/AFD PGM 3 activity to shift third phase emphasis away from rice towards local organizational development.

More than twice as much sustainable, irrigable, rice production potential remains untapped in Guinea’s unimproved inland *bas fonds* (bottomlands) and river basin plains. Despite an engaging FAO strategy (SNPI 1999) for developing micro-irrigation systems (SPPI), only a scattering of nongovernment organizations (NGOs), including USAID’s three PL480 Title II partners (OIC, AfriCare, and ARDA) are still tinkering with barely 2% of this unmet potential of 120,000 improveable hectares. Another 3% of Guinea’s irrigable *bas fonds* are eligible for improvements from the AfDB’s PRADER and IFAD’s PPDHG in Haute Guinée and the EU’s PDAGF in the forest region. Otherwise, Guinea’s sustainable rice production subsector will have to wait until enough of PACV II’s CRDs choose bottomland irrigation improvements out of their local infrastructure development options.

These approximately 200,000 ha of sustainable, irrigated or irrigable, swamp, bottomland, and river plain rice production space are crucial for the future of Guinea for three reasons:

- **Food Security:** We would hope that Guinea can be persuaded to follow many of its neighbors in rearticulating its Food Security Strategy, and therefore its FAO-led special program for same (PSSA), away from “food (rice) self-sufficiency” towards “food (rice) self-reliance.” Such self-reliance would still require, for arbitrage purposes, domestic rice production to increase so as to always match imports, however eternally more competitive those rice imports may remain. Even with imports continually underselling local production in even the remotest corners of the country, this arbitrage balance with local production is necessary of both household- and national-level flexibility, as long as environmental sustainability is not being irreparably damaged in the process.
- **Natural Resources Management:** Two-thirds of Guinea’s rice, half a million MT of paddy, is still grown under forest-destroying, landscape-burning, global-warming, and erosion-facilitating rain-fed conditions primarily on Guinea’s fragile hillside lands. If Guinea is going to conserve its own and West Africa’s water resources and realize its considerable comparative economic advantage for forest and agro-forestry products, it will have to wean itself, however gradually, from this practice of slash-and-burn agriculture for upland rice. This is a tall but unavoidable order that will be addressed at several junctures in this report. For now, remember that much of this upland rice can be physically (and, it will be argued, economically and sociologically) grown, in perpetuity, under some form of swamp, riverine, or bottomland irrigation regime. The economically and ecologically sound development of this sort of rice production alternative to hillside devastation must be part of any comprehensive NRM approach in Guinea.
- **Rural Income Growth:** Here we return to the poverty reduction (PRSP) focus of Guinea’s current development dialogue with the international community. With so many of its poorest citizens in the rural sector, Guinea cannot meet its PRSP contract with that international community without rural income growth. Most of that requisite income growth will not come

from rice. It will only come from higher-value agricultural tradeables, sold in national, regional, and international markets. Unlike Dutch disease-ridden mining, these agricultural tradeables, with some backward linkages from value-added processing (World Bank 1997:7), are Guinea's only immediate link (manufacturing is not yet an option) to export-driven growth, the only kind of economic growth that has ever worked in the underdeveloped tropics. Yet, however much physical comparative advantage Guinea may have for some of those agricultural tradeables (particularly irrigated garden, forests, and agro-forestry), its rural farmers can produce them more competitively if they are at the same time growing instead of purchasing (as a "wage good") their own food (rice). This is why some food self-reliance is necessary for small farmer agricultural systems to compete in export markets. If those small farmers have to buy too much of their, wage good, food with their export earnings, local food prices will rise to the point that their export production enterprise will cease to be competitive.

Of course, the abstract institutional development emphasis of the PRSP need not necessarily handicap progress towards this desirable shift from upland rice to micro-irrigation improvements and the rebirth of export-oriented agriculture in Guinea. However, as the currently predominant negotiated text between Guinea and its donors, this PRSP's reign coincides with a whole new generation of projects with equally abstract institutional objectives. These new projects are carefully designed to meet worthy organizational development objectives. Some, like USAID's PRADEV/CLUSA with its "associative enterprise" emphasis, are having instructive rural income growth impacts.

Unfortunately, these decentralized institutional development initiatives have replaced, in some cases abruptly, a generation of terminated and unrenewed projects with more precise agriculture policy reform and quantitative output objectives (e.g., the World Bank's PNSA and PNVA support to IRAG and *Service Nationale de Promotion Rurale et de Vulgarization* [SNPRV]; its *Projet Cadre de Promotion des Exportations Agricoles* and USAID's *Fondation pour l'Investissement et la Commercialisation Agricole* export enterprise promotion attempts; French efforts to restart coffee, cocoa [RC2], and cotton [CFDT]); and the EU's agricultural aspirations for the poorest parts of Haute Guinée [PDDD]). On the cash-cropping side, only the AFD-underwritten oil palm and rubber latex (*hevea*) parastatal in the N'Zerekore forest region, SOGUIPAH, is still standing. Some regional agricultural projects supported by UNDP (ODRIKouroussa, PAGuekedou) and IFAD (PAPE-BGNord and PDRSigui) have survived by shifting away from measurable production support towards more easily defended organizational development objectives. Only the French AFD, with the swamp rice and aquaculture emphases in PDAG-Forestière, are building on their own successes and those of the Arab Fund's (*Kabak*) mangrove rice to give any quantitative measure, such as yield per hectare, to crop-related poverty reduction indicators cited above.

A mid-cycle evaluation of poverty reduction (PRSP implementation) in Guinea, using the MAEF's 124 indicators (only six of which measure cropping performance; see the beginning of Section 4.1), and based on a just-completed household budget survey (GTZ), is scheduled to begin in the summer of 2004. It will show if the PRSP's new, institutional development emphasis can trigger growth and reduce poverty in Guinea more effectively than did the old production support and commercial linkage approach. In the meantime, however, we can safely say that this new PRSP agenda has been allowed to camouflage a retreat from prior policy commitments, at least with regard to the agricultural sector, on both sides of the table.

4.1.1 Donor Government Commitments

A retreat from the promised (OECD/DAC 2001) "policy coherence," between these collaborative poverty reduction objectives and unfair trading competition underwritten by agricultural subsidies at home, is underway. With respect to cotton, long before Cancun, the US has been cast as the most policy "incoherent," although Guinea's cotton subsector has just collapsed primarily on account of internal

incoherences. In a country like Guinea awash with unsubsidized Thai and Chinese rice, Japan's rice policy incoherence (see its KR2 initiative) is less heavily criticised. Unfair competition from Europe's milk, vegetable (onion), and wheat (see substitution effect) subsidies is still seen as causing the most damage to Guinea's agricultural outlook. While Guinea is considered to have received fair high-poverty country consideration, neither the US's AGOA nor the EU's STABEX and monetary facilities (e.g., UEMOA) are seen as having been designed with countries like Guinea in mind. Guinea's army confronted a more macabre form of donor government policy incoherence when rebels from Sierra Leone and Liberia attacked Guinean refugee camps with some arms manufactured in Organization for Economic Cooperation and Development member countries. The legacy of conflict diamond purchases in those Organization for Economic Cooperation and Development countries can also be seen as a form of policy incoherence.

4.1.2 Guinea Government Commitments

The policy failures have been better, though not perfectly, documented (e.g., *Comite national de lutte contre la corruption...Rapport de mission*: May-June 2003). Suffice it to say that of its three carefully negotiated, pre-PRSP agricultural strategies, only the most recent, Food Security (May 2003), is still given any attention (cf. DNAFIV) outside of the PRSP monitoring framework. Unfortunately, alas, this strategy is the most misguided of the three. As we have seen, its often explicit, and always implicit, upland rice emphasis undermines the sustainability of not only the other two strategies but of the PRSP objectives themselves. Under cover of PRSP abstractions, the other two are being increasingly ignored in any event:

- LPDA II's (September 1997) call for complete agricultural market liberalisation, *de jure* and *de facto*, has been drowned out by ministerial reorganisations to fit the PRSP priorities and, therefore, a lack of pretext or context within which donors could refocus GOG decision-maker attention on these prior commitments (Bioche *et. al.* 2003: 20-21); and
- Thus, the National Action Plan for Soil Fertility Management (PANGeFS, Mai 2001) has yet to open up fertilizer distribution. But then again, aside from DNEF's tripartite NRM portfolio (KFW's PGRR, the EU's AGIR, and USAID's PEGRN), no current projects come close to actualizing any of its recommendations. And only PEGRN in this NRM portfolio has even looked at fertilizer appropriateness and availability questions (McGahuey 2003).

Almost everyone in Guinea—from decision maker and donor to farmer—can accurately diagnose the causes—from road degradation to commercial collusion—of the current congestion of agricultural input and output markets, but with the LPDA II no longer on the table, and PANGeFS still on the shelf, nothing is being done about these bottlenecks.

Meanwhile, everyone in the reorganized government and the donor community is working on the institutional development agenda underpinning the PRSP. But we have seen that without agricultural growth, even though the PRSP passes over that sector in virtual silence, its objectives cannot be met.

4.2 Once and Future Strategies

For these reasons, then, a closer examination of the LPDA II (1997) commitments, how they atrophied, and how USAID might contribute towards getting them back on track, is in order. The LPDA II goals remained unchanged from those of LPDA I:

- Food security supporting increases in crop and livestock production,
- Increased agricultural exports, and
- Sustainable and biodiversity protecting NRM.

But in LPDA II new means are invoked: private sector actors and agricultural modernization. As LPDA II was being written in 1996, Guinea's overall economy had stalled out more than its agriculture sector. This decline is attributed to falling bauxite prices on the world market, but in casting this changing ratio as a series of "opportunities" for the rural sector, LPDA II implicitly offers a more penetrating diagnosis:

1. Rural growth can reduce Guinea's vulnerability to the mining subsector.
2. Crop diversification trends, if further supported, particularly in the more vulnerable (poorer) regions, would put Guinea's food security objectives in reach.
3. Agricultural export growth always coincides with food import decline, thus support for cash crop production also constitutes support for this food security policy as well.
4. The current dynamism of agricultural enterprise, in spite of sparse financial or juridical backing, can be expected to grow exponentially once these institutional constraints are addressed.
5. Concurrently, this private sector dynamism suggests that the state no longer needs to engage in production or marketing actions.
6. Improved inputs, seeds, fertilizer, phytosanitary products, and mecanization need to be encouraged.
7. The (partially spontaneous) growth of beneficiary associations, *organisations professionnelles agricoles* (OPAs), can both improve and replace public sector delivery of agricultural services.
8. Food self-sufficiency and employment generation can bring down the appalling proportion of rural Guineans living in poverty: 52.5%.
9. All of the above should still allow for sustainable NRM and a protected environment.

Since LPDA II published this list, with the possible exception further OPA proliferation and some cosequent crop diversification, none of these trend-based opportunities have been realized. But at least when LPDA II governed the donor/Guinean dialogue, numbers 1-3 and 5-6 were on the top of that agenda. In the current PRSP dialogue, explicit policy analysis links to only numbers 4 and 7 can be found.

Perhaps because these LPDA II objectives were so general and ambitious that they were unable to be obtained. The LPDA II document itself does not offer a realistic or affordable strategy for prioritizing or meeting these objectives. This does not mean, however, that the wrong objectives were being set. Most of them involve coherent cooperation with other branches of the GOG beyond the MAEF. Yet no GOG commitment for such inter-Ministerial cooperation was programmed, leveraged, or obtained. But before this policy disconnect could be explicitly addressed between the GOG and its donors, the new PRSP framework commanded the attention of most of the relevant decision makers. Nevertheless, the LPDA II perspective remains, in large measure, valid. For all of its strategic inadequacies, its analytical outlook, with one glaring exception, should be retained.

LPDA II, like LPDA I before it and the 2003 National Food Security Strategy after it, still gives too much credence to rural and even national food self-sufficiency as fundamental to its food security objective. Unlike these other documents, LPDA II places a healthy emphasis upon export agriculture and farmer-financing opportunities for the extension of irrigated agriculture. But, like the others, it still closes its national food balance books with an expansion of low input, rainfed hillside rice cultivation (from 308,000 ha to 562,000 ha). Even though rice imports have become even cheaper and more reliable since LPDA I, LPDA II still does not sufficiently trust either the reliability of that market or its own projections of export-driven rural income growth to face the hillside rice conundrum. That dead end can be summed up as follows: it is more expensive to sustainably intensify—which can only be achieved with full terracing—rainfed, hillside rice production. The alternative is to combine an expansion of swamp (*bas fonds*), plain, and mangrove irrigation with sustainable forest gardens with income-earning tree crops. Under LPDA II, more hillside rice would lead to more bush fires and soil erosion. Not only would the topsoil future of these rainfed farms be compromised, without that topsoil any future options of planting

soil-conserving perennial (tree) crops on these hillsides would be foregone. Finally, that eroding topsoil would damage and thus raise the cost of irrigation improvements downstream. So, while calling for a second look at LPDA II overall, the Assessment Team notes that the LPDA II's food security objective and its NRM one are contradictory. The Assessment Team's recommendations will point out a way for reconciling this discrepancy.

Even though, or perhaps because, this LPDA II agenda has atrophied, the MAEF's BCPEA is elaborating terms of reference for a LPDA III exercise to commence, coincidentally, shortly after this summer's (mid-2004) PRSP implementation mid-cycle evaluation. Hopefully, these terms of reference will draw upon BCPEA's excellent *Programme d'Appui a la Securite Alimentaire* filiere studies (rice, palm oil, maize, fonio, peanuts, manioc, potatoes, and onions) already put to good use by the *Projet Cadre de Promotion des Exportations Agricoles* final report (Gergely, Grouitch and Lugros 2001). USAID should jump into these LPDA III deliberations with both feet.

4.3 Re-engaging Policy Dialogue, from Project Means to Performance Ends

Learning our lessons from this LPDA II to PRSP disconnect, we should focus the future agenda on more tangible performance targets. Institutional support may be in many, or even most, cases the best route towards rural income growth in Guinea, but it should not be set up as an end in itself, like the PRSP and too many of the projects that have flowed from it. Governance, decentralization, participation, and organizational development are means to an end, not ends in themselves. Tangible ends that should be pursued are:

- **In the food security domain:** Rice production increases, through economically and ecologically sustainable water management improvements, at the same time as hillside rice hectareage is permanently converted to tree crops and/or sustainable forest management. Fortunately, thanks in large part to the preparatory work of USAID and DNEF, the land tenure underpinnings of this proposed shift could be managed. The soil fertility and water resource conservation impacts of this land-use transformation will facilitate its cash cropping analog. (See Section 6.0)
- **As an engine of rural income growth:** An increased volume of higher-value export crop production and value-added processing, whether for regional (fruit juice, bananas, potatoes, and onions) or international (pineapples, cocoa, shea butter, and cashew) markets.

In addition to reducing rural poverty, both of these quantifiable targets, to the extent that they are sustainable, will engender progress towards Guinea's NRM objectives and contribute towards such international environmental public goods as biodiversity protection, brushfire mitigation (CO² reduction), and carbon sequestration (CO² removal). This does not mean that these quantifiable targets can be met without at least some of the progress in institutional decentralization and capacity building forecasted in the PRSP. But no amount of institutional progress will reduce poverty unless these quantifiable benchmarks are deliberately sought and obtained.

Many donors are increasingly hanging their contribution towards PRSP implementation on the local institutional development process being structured by the World Bank-funded PACV. PACV has just received a midterm review (World Bank 2003) with a view towards a transition into a second phase, absorbing the only other major World Bank-funded project still in operation, PNIR, along the way. UNDP undertook a midterm review of their *Programme de Développement Local en Guinee* shortly thereafter (Sylla *et. al.* 2003) with a view to folding that effort into PACV2 as well. French and Canadian aid are already contributing towards PACV1.

PACV2 will not begin unless elections for new, sub-prefecture level CRDs are held (before the end of 2004). It has been 10 years since the current commissioners had to stand for an election. Replacements

have been appointed by the administration in between. This degree of central control has seriously impeded the implementation of PACV1 and, therefore, PRSP intent. The assumption is that this last thread connecting Guinea to its PRSP, and through it to debt support from the Bretton Woods institutions, will not be broken. CRD elections are provided for in the GOG 2004 budget.

Under PACV, in the name of the PRSP, an elaboration schedule of local consultations has been developed:

- *Diagnostic Participatif*
- *Plan de Développement Locale*
- *Plan Annuel d'Investissement*

These participatory planning processes are prerequisites for designating the use by the CRD of *Fonds d'Investissement Villageoises* (FIV) for social and market infrastructure (PNIR roadwork will be folded in here under PACV2), and *Fonds Locaux* for productive infrastructure (e.g., irrigation) and revenue-generating activities (Guichet « C ») as well as for advisory services and action research (Guichet « D »). Groupements within the CRD sub-prefecture can apply directly for *Fonds Locaux* resources to prepare (Guichet « D ») and implement (Guichet « C ») an acceptable revenue-generating activity. For PACV2, a Guichet « E » of the *Fonds Locaux* for producer organization development around agricultural production activities is being anticipated. This structure, for all its current transparency shortcomings, offers some important advantages to a USAID agricultural strategy for Guinea:

- It includes an increasing number of the other major donors (and their money).
- It is moving beyond the provision of public goods, always tricky in Guinea, to supporting income-generating possibilities for smaller groupements and producer organizations.
- *Plan Annuel d'Investissement* links between the CRDs' disposition of FIV and *Fonds Locaux* funds and participatory planning (*Diagnostic Participatif* to *Plan de Développement Locale*) are being clarified and enforced for greater transparency and "contractuality."
- If enough donors join forces within this PACV structure, its claim of decentralizing resources allocation decisions to a local level might ring less hollow.

Guinean agriculture cannot sustainably intensify until the necessary land-use changes are worked out at a very local level (see Section 6.0). Those land-use changes still will not happen unless investments in the productivity of that land (e.g., irrigation and soil fertility management) are made. Those investments should not be made unless the *Plan de Développement Locale* includes a sustainable land-use plan (utilizing wherever necessary the land tenure security "contract mechanism," see Section 6.0). If this sort of planning-to-funding linkage is enforced, then all multi-donor PACV money would be leveraging land-use change at the same time as it was purchasing local infrastructure and crediting local enterprise.

If sustainability planning is made part of the *Diagnostic Participatif-to-Plan de Développement Locale-to-Fonds Locaux* funding link under PACV2, the genuine decentralization called for in the PRSP will receive its economic, and therefore political, reward. But that economic reward will not last unless output markets for agricultural produce from these improved lands are found at national, regional, and international levels. USAID needs another form of leverage to ensure that such market outreach is not sabotaged. Democratic transparency, roads, and market information are the first steps. But ultimately, for a landscape with as much potential as Guinea's, foreign investment has to be brought in and protected. When faced with better governance of the host countryside, USAID has many instruments at its disposal with which to attract and protect such private investment (e.g., AGOA, OPIC, and DCA). In the meantime, the mid-2004 agribusiness outreach exercise of the Corporate Council for Africa would be a good place to start.

5.0 ANALYSIS OF ENABLING ENVIRONMENT FOR AGRICULTURAL DEVELOPMENT

5.1 Overall Policy Environment and Institutional Capacity

Guinea's LPDA I, adopted in 1992, and the subsequent LPDA II, adopted in 1998, established strategic orientations and actions to be implemented within the rural sector. Key features of both policy documents are:

- food security,
- production for exportation, and
- rational and durable utilization of natural resources (soil, water, forests) and biodiversity.

Some weaknesses were identified with LPDA I concerning an absence of priority setting among activities implemented, unclear directives for development of the private sector, little assurance in sustaining investments in the agricultural sector, and no strategy for capacity development. LPDA II focused and concentrated on institutional restructuring that reorganized the extension service, privatized veterinary services, and facilitated the development of rural groups. In recent years, LPDA II thinking and approaches have been broadened to include greater emphasis on food security, water management, intensified production, increased support for the private sector, protection for the environment, and diversification of agricultural production. The most identifiable flaw in LPDA II is in the policy environment that places emphasis on a national food security policy centered on self-sufficiency in rice production. This policy is not consistent with WTO objectives of a more efficient world marketplace and investments at a time when rice on the world's markets can be purchased at cheaper prices than Guinea's cost of production. There are some cultural positives with locally produced rice and it behooves the government to adopt a strategy of rice production under sustainable production systems. Over 65% of rice produced in Guinea is on the hillsides that are severely degraded and present severe downstream problems in neighboring countries. Guinea simply cannot justify long-term investments in this crop with marginal cropping conditions if returns to investment are below regional and international standards. It is significant to note here that LPDA II and a proposed successor LPDA III (terms of reference prepared for a new policy to coincide with PRSP through 2015) must be closely associated with the objectives of the PRSP. Planning and implementation of LPDA III and the PRSP must be linked to concrete measures that can be evaluated to demonstrate progress towards poverty alleviation. In sum, Guinea's macroeconomic strategy must be closely tied to microeconomic production in rural areas. The GOG must do its part to promote and enhance production. It must exploit domestic comparative advantage with long-term domestic investments. For donors, pending reliable policies and internal government support, Guinea needs assured financial support to maintain operations of key programs (e.g., agricultural research and statistics, rural engineering, and rural governance).

Guinea's institutional capacity in support of viable agricultural sector investments has taken a turn for the worse since a reasonable buildup in the mid- to late 1990s. One of the World Bank's flagship projects (National Agricultural Services Program) that provided sector support was terminated in 2000 due to non-compliance with lending conditions. Closure of this project meant very little resources committed to agricultural research stations, extension services, and capacity building. There were rumors that significant numbers of the Ministry of Agriculture's official staff were not paid on a regular basis. A number of deficiencies were highlighted in a recent evaluation of public expenditure funded by the World Bank (cf. rural sector expenditure review):

- Merging functions between agricultural and extension personnel;

- Non-classification of functions and conditions of service commensurate with duties of agricultural agents;
- Lack of properly trained scientific personnel;
- Insufficient management systems for personnel, finance, and operating resources;
- Absence of an agronomic research plan and lack of liaison between researchers and extension agents;
- Absence of data that shows the impact of agricultural extension programs;
- Insufficient interest in establishing sound agricultural sector statistics;
- Insufficient collaboration between agricultural ministry's line agencies (*Direction Nationale de Genie Rural*, SNPRV) in irrigation perimeter development; and
- Absence of a plan to address recurrent costs in rural road maintenance and the absence of a maintenance plan for infrastructures developed in the rural sector.

5.2 Regulatory Framework

Guinea's regulatory framework towards promotion of increased agricultural production is in a severe state of disrepair. In the past five year period, the GOG has approved new policies that are clearly oligarchic in nature (Arrete 98-05/MPSPIC/SGG/97) to channel agricultural sector produce to international markets. While the issue of product quality is addressed in each of the new export regulations, limits of trading to a few "buyers" is not the ideal practice to institute efficient market relationships. Donor efforts must be brought in line to assist the GOG to improve macro trade and sector policies, strengthen public sector institutions that serve the private sector, and involve active participation of private sector businesses, domestic and international research institutes, civil society organizations, and NGOs in dialogues to resolve constraints and issues within the sector. In sum, the GOG should seek to establish an enabling environment that improves operating conditions for agricultural producers and marketers as opposed to policies and programs that constrain their access to the market place.

5.3 Agricultural Credit and Microfinance

Agricultural credit is essential towards meeting capital requirements of small scale producers, traders, and exporters to make production system work and fuel economic growth that will eventually result in reduction of poverty in rural areas. The microfinance experience in Guinea is mixed similarly to most activities dealing with governance, financial management, and policy. However, there are currently more documented successes than failures in microfinance systems in Guinea. Organizations that appear to be having a high degree of success with direct rural financing or loan intermediation are *Credit Rurale* financed by French Cooperation, PRIDE financed by USAID/Guinea, and credit programs operated under the auspices of IFAD. The documented failures during the past decade are *Credit Mutuel* and credit facilities offered under the auspices of the Agricultural Marketing and Investment Program (AMIP) and the *Projet Cadre de Promotion des Exportations Agricoles*. AMIP and *Projet Cadre de Promotion des Exportations Agricoles* were funds established to promote commercial and export marketing of agricultural produce. The earliest experience with agricultural credit and microfinance in Guinea dates back to 14 years with French investment in *Credit Rurale*. *Credit Rurale* currently has an active loan portfolio of FG 13 billion. PRIDE started a combination loan and training programs in Guinea 1991 and the program now operates a loan portfolio of FG three billion.

The vast majority of credit extended to farmers in Guinea is through microfinance systems, while there are some instances where certain individuals have access to credit through preferential lending practices (e.g., "crony capitalism"). Microcredit is extended primarily to groups as solidarity groups. This system relies on social pressure. If a member does not pay, other members pay in his/her place. Solidarity groups vary from five to 10 and in some cases up to 25 members. Overall the experience using such groups has been good with loan repayment rates upwards of 95%.

Commercial banks in Guinea, as a practice, still do not have interest or experience in agriculture sector lending for long-term development. One banker noted that the economy in Guinea is commerce-based; that excludes production either industrial or agricultural. Most banks are not set up to handle small, individual farmer loans and prefer larger transactions. CLUSA's programs are addressing this need by training community-based organizations around revenue-generating activities and preparing these organizations to prepare loan requests with commercial lending institutions. Another banker informed the Assessment Team that, "if banks are to become seriously involved in agricultural sector lending, there must be more respect for commercial law." Commercial banks have had difficulty in collecting on defaults even when the courts rule in their favor.

The issue at hand in the rural financial sector is a requirement for improved financial governance through Guinea's existing commercial laws. It is our belief that Guinea's existing commercial laws, are adequate to meet the needs of private sector finance and business organizations if the laws are enforced.

5.4 Grades and Standards (Public/Private)

Public grades and standards to improve export marketing from Guinea's agricultural sector exist only for cocoa and coffee (GOG Arrete 98-05/MPSPIC/SGG/97). This legislation was designed to improve the quality of these products for export through the port of Conakry. Despite concerns for quality production, there appears to be inadequate diffusion of cocoa and coffee quality standards at the producer level. Guinea's coffee and coffee products are not sold widely on the world's markets due to its low quality relative to imports from other regions of the world. Guinea's coffee variety (Robusta) also limits its market share to markets in Europe, the Middle East, and Asia. Arabica coffee is the preferred variety in most coffee markets.

5.5 Transport

Guinea's transportation sector has recorded higher growth than most sectors during the past five-year period. One report noted that the sector grew nearly 5.8% in 2001 and nearly 6% in 2002. It was also reported that investment by Guinean government in transportation has totaled nearly \$350 million since the mid-1980s.

It was evident that rural development should be one of the GOG's top priorities to promote greater commercialization of agricultural produce to raise incomes and alleviate poverty. PNIR2 will attempt to address these priorities pending policy adherence on structural adjustment targets that will release funding by the Bretton Woods Institutions.

5.6 Communications

Guinea's telecommunication system was partially privatized during the mid-1990s. From documents reviewed, the majority of private investment in the industry comes from Malaysian investors who have tolerated government interference more so than private sector investors in the electricity and water sectors. Telephone calls within and exterior to Guinea are unreliable, while demand is high for both services, especially from Internet subscribers. Additional cellular service was announced for outlying regions in November 2003 but not implemented prior to the departure of the Assessment Team in mid-December 2003. There are three known cell phone providers operating in the country. However, it was reported that these companies are generally over-subscribed (the Assessment Team experienced firsthand problems with Internet hookups in regional centers). The Assessment Team was also informed about a new tax that would be levied on private sector companies (cellular phone providers) but as of mid-December 2003 they saw no evidence of the new fee.

5.7 Roads

PNIR1 attempted to address the critical need for linking markets and agricultural production zones. During PNIR1, over 7,000 kilometers of rural roads were improved to link up to critical national roads. Some were also rehabilitated during that time. While quality of roads constructed were evaluated to be sound and in key strategic zones, maintenance of the roads has fallen short of expectations. Village committees for maintenance were organized but never funded effective maintenance programs. The lack of operating maintenance systems is still an open policy question for sustainable agricultural production and market development.

PNIR2's (currently suspended along with other World Bank financial instruments) objective is to rehabilitate nearly 17,000 kilometers of rural roads and community tracks, and it will revisit establishment of village management and maintenance systems as proposed in PNIR1. The PNIR2 environmental assessment report noted that the program will not create new roads or track but will instead focus attention towards rehabilitation of existing roads and tracks. The program, once fully funded, is expected to run for twelve years. Targets have been established to rehabilitate 1,400 kilometers of roads/tracks per year. Overall program objectives are:

- to establish efficient management and road maintenance systems parallel with road rehabilitation;
- to decentralize road infrastructure programming to communities;
- to limit infrastructure planning in relation to technical and financial capacity of management entities;
- to develop intermediate means of transportation;
- to establish a priority development of creating accessible conditions tied to CRD program support; and
- to establish a planning, management and maintenance system in conformance with the rules and regulations governing the establishment, organization and functions of decentralized territorial collectives or CRDs.

The role(s) of the CRDs are of utmost importance for future development programs in rural communities.

5.8 Storage

Adequate storage in the rural sector is necessary to safeguard production and to reduce food insecure populations. Adequate storage is also necessary to protect fragile agricultural produce from the field to commercial markets. On-farm storage technologies are improving with the assistance of several micro level projects in Guinea's high-poverty zones. AFRICARE and ADRA in Haute Guinée introduced improved grain storage bins fabricated locally with appropriate technology that protect grains from vermin and insect, thereby reducing post harvest losses. We recommend that this level of appropriate technology be widely extended throughout high poverty or food insecure zones where populations are increasing their cereal production with improvement in farm-level technology.

In the public sector Guinea's current storage capacity is approximately 100,000 MT. The bulk of the estimated tonnage is believed to be reserved for cereals (principally rice), and the remaining tonnage is reserved for an assortment of products (e.g. coffee and cocoa). There is insufficient cold storage in Guinea to safeguard the quality of fresh produce. Inadequate cold storage is the first limiting factor for exporting a host of high-value crops to Europe and neighboring countries.

The GASA Team strongly recommends donor dialogs with GOG officials to improve the investment climate such that Guinea can take advantage of its comparative advantage in fresh produce for export (e.g., pineapples and mangoes).

5.9 Electricity

Guinea's electrical situation is at a crisis. Electrical energy is such short supply that the second and third largest cities in the country are without power during daylight hours. Some of Conakry's communes have been without electrical power for upwards of 20 hours a day. Lack of readily available energy severely constrains investment in value-added industries in the rural sector that depend upon viable and reliable sources of energy. In the early 1990s Guinea undertook public sector reforms and privatized the electrical energy sector. These reforms laid the groundwork for achieving donor financing for the Garafiri Dam completed in 1999. Since that time problems have risen with turbines purchased and other problems due mainly to ineffective personnel and management procedures. It is doubtful in the Garafiri Dam's total megawatt output will ever meet Guinea's short-term requirements. In recent months, private sector electric companies have left the country reportedly due to both corruption and government interference. The Assessment Team could not obtain a copy of the anticorruption study funded by the World Bank to substantiate the allegations.

5.10 Water Supply System

Potable water systems are critical to improving the livelihood of rural inhabitants and poverty reduction through intensification of cropping systems in fertile land basins. Water systems for urban centers were privatized along with urban electrical systems in the mid-1990s. A similar fate has been reported on private sector water companies. All have departed Guinea because of corruption and government interference. Again, the Assessment Team was not privy to the anticorruption report to verify these allegations.

On a per capita basis, Guinea citizens have as much as three times more water through rainfall than their West African neighbors. In the rural sector, Guinea's national service for water well development, *Service National d'Aménagement des Points d'Eau* (SNAPE), has a sole mandate to respond to the increasing demand for potable water. The service was restructured under the aegis of LPDA II to be more economy-minded and reduce permanent staff. SNAPE use a system of contractors to assist in water well development, engineering, and prospective activities. Harnessing water resources for increased agricultural production must become a greater priority in discussions in setting the agenda for LPDA III.

Table 7: Irrigable Potential of Guinea

Types of Irrigation	In hectares
1. Small and medium plains behind coastal mangrove stands	50,000
2. Small and medium river plains	20,000
3. Vegetable Gardens	2,000
4. Plains for vegetable production	10,000
5. Bas-fonds for two rice crops a year	22,000
6. Bas-fonds with rainy season rice and dry season vegetables	20,000
7. Large plains for rice production near the sea	150,000
8. Large plains for alluvial fluvial rice production	90,000
TOTAL	364,000

Table 8: Guinea Country Data

Environmental strategy/action plan prepared in 1994	Country Data	Group Data	
		Sub-Saharan Africa	Low-income nations
Population (millions)	7.6	674	2,506
Urban population (% of total)	28.0	32.3	30.8
GDP (\$ billions)	3	316	1,082
GNI per capita, Atlas method (\$)	410	460	430
Agriculture			
Land area (1,000 km ²)	246	23,603	33,031
Agricultural land (% of land area)	50	42	..
Irrigated land (% of crop land)	6.4	4.3	25.2
Fertilizer consumption (100 grams/ha arable land)	36	127	663
Food production index (1989-91 = 100)	159	126	128
Population density, rural (people/km ² arable land)	607	359	510
Forests			
Forest area (1,000 km ²)	69	6,436	9,131
Forest area (% of total land and area)	28.2	27.3	27.1
Annual deforestation (% change, 1990-2000)	0.5	0.8	0.8
Biodiversity			
Mammal species, total known	190	..	..
Mammal species, threatened	12	..	..
Bird species, total known	409	..	..
Bird species, threatened	10	..	..
Nationally protected area (% of land area)	0.7	9.9	9.2
Energy			
GDP per unit of energy use (PPP\$/kg oil equiv)	..	2.9	4.0
Commercial energy use per capita (kg oil equiv)	..	669	569
Energy imports net (% commercial energy use)	..	-62	-9
Electric power consumption per capita (kWh)	..	432	352
Share of electricity generated by coal (%)	..	69.8	45.0
Emissions and pollution			
CO ₂ emissions per unit of GDP (kg/PPP\$GDP)	0.1	0.4	0.5
CO ₂ emissions per capita (mt)	0.2	0.8	1.0
Consumption of CFCs (ODP metric tons)	38	5,842	20,096
Particulate matter (pop-weighted average-ug/m ³)	69	54	64
Passenger cars (per 1,000 people)	..	..	9
Water and sanitation			
Freshwater resources per capita (m ³)	30.479	8,306	6,559
Freshwater withdrawal			
total (% total water resources)	0.3	..	..
agriculture (% total freshwater withdrawal)	87	85	90
Access to an improved water source (% total pop)	48	58	76
rural (% rural pop)	36	46	70
urban (% urban pop)	72	83	90
Access to sanitation (% total pop)	58	53	44
rural (% rural pop)	41	45	31
urban (% urban pop)	94	76	72

Environmental strategy/action plan prepared in 1994	Country Data	Group Data	
		Sub-Saharan Africa	Low-income nations
Under-5 mortality rate (per 1,000 live births)	169	171	121
National accounting aggregates - 2001			
Gross national savings (%GN)	21.0	15.0	22.1
Consumption of fixed capital (%GNI)	8.2	10.4	8.8
Education expenditure (% GNI)	2.0	4.7	2.8
Energy depletion (% GNI)	0.0	7.9	6.6
Mineral depletion (% GNI)	4.1	0.5	0.4
Net forest depletion (% GNI)	1.9	0.7	0.3
CO ₂ damage (% GNI)	0.3	1.1	1.6
Particulate emission damage (% GNI)	0.6	0.4	0.6
Adjusted net savings (% GNI)	7.9	-1.3	6.6

Source: World Bank

5.11 Agricultural Research and Technology Development

Agricultural research and technology development in the agricultural sector is the responsibility of the Ministry of Agriculture and Livestock. Agronomic research activities are under the tutelage of the *Institut de Recherche Agronomique de Guinée* (IRAG). IRAG operates four regional centers: Foulaya for Guinée Maritime, Bareng for Moyenne Guinée, Sereidou for Guinée Forestière, and Bordo for Haute Guinée. IRAG also operates two specialized centers at Kilissi in Kindia (rice, corn, peanuts, and seed technology) and Koba in the Boffa prefecture that addresses research needs in mangrove rice production. A major livestock research center (with some prior USAID assistance) is located at Faranah and a breeding station for N'Dama cattle located at Boke.

Guinea's agronomic, livestock, and irrigation complex employs a research staff comprised of more than 200 researchers, technicians, and administrative personnel.

Guinea holds agreements in agricultural research and technology development with the principal International Agricultural Research Centers, WARDA, SASSAKAWA Global 2000, CORAF, CIRAD, IRD-CNRA in Côte d'Ivoire, and ISRA in Senegal. The bulk of Guinea's agricultural research and technology development is through adaptive research protocols. Most of the research undertaken is demand-driven in nature and it generally responds to constraints determined by farmers.

Since closure of the World Bank's agricultural support program, primary constraints towards improving research to address farmers' needs are due to a lack of investment funding by the central government. For example, IRAG's programmed funding for 2003 under the World Bank program was estimated at \$2.18 million and local funds at \$197,480, or roughly 9% of the total budget. Numerous reports to the assessment team noted that it is doubtful if the 9% allocated in the government's budget is disbursed to the research centers. Since suspension of the World Bank program, Guinea's research and extension agencies have been operating at or below 10% capacity. The funding gap for research and technology development is partially addressed through donor-funded projects as well as assistance through a host of rural sector PVOs.

5.12 Human Resource Development

Insufficient human capital continues to thwart Guinea's objective towards increasing agricultural production. While exact data was not available on the number of unfilled positions within existing agencies, the World Bank-funded expenditure survey noted that at the institutional level, there is a weak

capacity for planning, programming, budgeting, monitoring, and evaluation in every category of rural development programs. This survey also confirmed the low level of statistics available to strategic planners and implementation officers and weak efforts to promote the private sector and policies that favor improved agricultural productivity and marketing. The report recommended that Guinean ministry officials redirect budget resources that will be targeted towards reinforced institutional and human capacity development for agricultural program administration, policy formulation, strategic planning, and program development.

5.13 Information Technology

Almost all of the administrators for Guinea's agricultural services visited during this assessment cited severe deficiencies in information technology and their inability to generate accurate data to meet the demands of farmers, private sector operators, agricultural sector planners, and implementation agents of technical programs. The expenditure survey financed by the World Bank recommended that the GOG increase expenditures for capital equipment and expertise to establish reliable databases, especially in support of agricultural investment opportunities. Improved information technologies will also assist Ministry of Agriculture officials in macroeconomic analyses, make improvements in monitoring and evaluation of the subsectors, improve microfinance management, and develop simulation models for agricultural sector policy programs.

5.14 Market Information

Market information for producers, buyers, and sellers of agricultural produce in Guinea is not consistently available or available in a timely manner. Prices paid for farm produce are announced on weekly radio broadcasts through the "radio rural" system but most data is not current given the difficulty in collecting prices at the farm and local markets and subsequent transmission of the data through existing communication channels. Officials at the ACA noted their plans to increase personnel in the field for data collection, improve data processing techniques, acquire information technologies, and lobby for more frequent transmission of price information to all agricultural production zones. ACA needs assistance to improve their coverage of production zones as well as the means to process and disseminate market information in a timely manner. The Assessment Team was advised that the local chamber of agriculture would also undertake the development of marketing information systems for the benefit of producers. Greater efforts must be undertaken by the GOG, with assistance from donors where appropriate, to improve market information with an overall objective of strengthening agricultural produce markets throughout Guinea.

5.15 Land Tenure

The issues in land tenure and poverty reduction are inextricably bound. Worldwide evidence shows a strong correlation with intensification of agricultural production and land tenure. Simply put, farmers see the value of investing in the land if they are provided a level of security to assure reaping the benefits from their investments in the land. The GOG has provided enabling legislation for the rural sector with the enactment in 1992 Land Tenure Code (L/0/92/019). Subsequent enactments of laws relating to forestry codes (L/99/013/AN), protection of plants and animals (L/97/038/AN), and a special decree that focuses on land tenure in rural areas (D/2001/037/PRG/SGG) are structured to improve the livelihoods of rural inhabitants if implemented accordingly to the intents and purposes of the law. The GOG has adopted a land tenure and security components under the PNIR2 in favor of poverty reduction with objectives of improving the access and conditions for sustainable exploitation with security or tenure rights. The underlying features of this new legislation are contributions to and maintaining social peace, improvement in exploitation conditions that lead to sustainable development of land resources, improvement in access condition to land of poor social groups, and local capacity development. A system of contract tenure practices is operational in Moyenne Guinée. These programs were planned and directed through the

auspices of the USAID/Guinea-funded Enlarged Natural Resources Management Project. USAID/Guinea should strongly consider expanding the contract mechanism to other areas of Guinea in light of national attention to land tenure under PNIR2. PNIR2 supports a stronger role of CRDs in management of land tenure programs. PNIR2 programmers believe that reinforcement of land tenure transaction capacities will be assured by:

- a system of model contract and cartographic documents (land management plan);
- within each CRD, an autonomous or independent village legal counselor; and
- strengthening of the CRDs with regard to capacity for registration, conservation, and updating contracts and interpretation of public laws regarding land tenure.

It is imperative that the PACV program be reinstated to perform a much-needed role of strengthening local governance in favor of CRDs in augmenting their capacity to manage equitable land redistribution programs, monitor tenure practices, and spearhead community investments towards poverty reduction.

5.16 Rural Organizations

Guinea has an impressive number of organizations operating in rural areas that are contributing significant resources and technical assistance for the benefit of farmers and farmers' organizations. Annex 2 lists the organizations that are officially registered with Guinea's national NGO liaison and coordinating office. The Assessment Team was highly impressed with the quality of technical and policy leadership in a number of PVOs working within the rural sector. There is a great deal of initiative and investment by these organizations to improve the welfare of farmers within the span of their management zones. It is important to assist these organizations to increase their access to and awareness of their rights and privileges under enacted laws and regulations. USAID/Guinea's S04 recognizes the importance of civil society's access to legal provisions that apply to organizational activities and the roles of individuals participating in selected activities. Donor organizations that finance rural sector development should consider active support to rural sector organizations that implement programs to build human and institutional capacity in rural areas. Such programs could enhance the ability of rural groups to manage activities related to improvement in cultivation technology, adaptive research, market development, and market information systems. Other worthy assistance programs would be regional farmer-to-farmer programs, regional farmers unions, and regional market/cross border trading arrangements. The focus of these programs would be on harmonization of politics, rules, and regulations among neighboring countries. We know that greater regional integration will provide Guinean producers with opportunities to export their products without government interference and less stringent or impeding standards. CLUSA and Winrock have already established formidable relationships with farmer organizations and PVOs. Expansion of these programs to other areas of Guinea is strongly recommended.

5.17 Input Supply and Delivery Systems

In 1998, as part of the reorganization of the Ministry of Agriculture, Guinea liberalized importation of veterinary medicines/supplies and certain agricultural inputs. The national soil fertility and inputs initiative (FAO) was well conceived but severely mismanaged by government and private sector officials with close ties to the ruling government elites. The enabling legislation removed government subsidies on fertilizers and other inputs. Taxation on inputs was reduced to exceed not more than 5% of the price paid by the farmer.

A number of technical recommendations were broached concerning soil fertility and the use of fertilizers:

- The Ministry of Agriculture agreed to conduct soil fertility test for soils for each crop grown with the use of fertilizers;

- The regulation requested research tests and analyses to be performed on yields and economic benefits after fertilizer application;
- Extension materials based on the experiments would provide farmers with optimal use of fertilizers;
- Research trials were also ordered to monitor soil biomass to insure optimal retention of fertilizers in various cropping situations. Fertilizers formulations would be tailored to meet soil fertility requirements; and
- Fertilizer procurement guidelines were established to render prices to farmers at the lowest cost possible by bulk transportation, packaging to complement transportation limitations due to road conditions and storage.

Subsequent to this new legislation, the Japanese International Cooperation Agency attempted to introduce fertilizers at the national level through private sector vendors through Guinea's Chamber of Agriculture in their bilateral Kennedy Round II project. The national soil fertility and inputs initiative (cf. FAO) was well conceived but severely mismanaged by government and private sector officials with close ties to the ruling government. The vast majority of Guinea's farm inputs (fertilizers, pesticides, and packaging materials) are exported from neighboring countries. Efforts are being made by one firm (SPECIA) to tailor inputs to specific crops (e.g., cashews).

5.18 Agricultural Business, Processing, and Value-added Enterprises

A list of agricultural businesses currently operating in Guinea can be found in Annex 6. It is a commonly held fact that Guinea's fruits and vegetable produce are of high quality and possess a relative high comparative advantage to similar agricultural produce in the region. If the Guinea agricultural sector is to maximize earnings on agricultural produce, there are a number of value-added industries that could easily be managed by private sector entities provided that suitable policies exist that promote and protect agricultural sector investments (e.g., juice factories, concentrates, dried specialty fruits, cooking oils, and cosmetic products). In addition to a coherent agricultural commercialization and promotion policy, there are a number of limited factors that must be over to make value-added investments more viable (e.g., reduction in transport costs, improved energy system, management training, and market identification).

There is a litany of failed value-added industries in Guinea that were due in part to one or more of the limiting factors stated above. Recent legislation to develop limited marketing cartels will undoubtedly discourage future investment in value-added enterprises.

6.0 ANALYSIS OF CROSSCUTTING ISSUES AFFECTING AGRICULTURAL PRODUCTIVITY AND ECONOMIC GROWTH

6.1 Natural Resources Management

All of West Africa and its donors have been talking about Guinea as their water tower (“chateau d’eau”) for several decades. The only major West African river system that does not receive over half of its water from Guinea is the Volta. The regularity of flow into the Niger, Senegal, and Gambia River basins depends upon the water storage capacity of Guinea’s landscape. As deforestation continues and Guinea’s expanding farming population slashes and burns more and more fragile hillside land (now 85% of all farmland), each of these rivers experience a faster flood, carrying precious topsoil silt away from Guinean agriculture, followed by dry season flows that dwindle to a trickle.

The agricultural opportunity cost of slash-and-burn subsistence farming on Guinea’s hillsides is not only felt from the topsoil loss from these hillsides themselves. The erratic water flow accompanying this violent erosion downstream compromises too much of the unrealized irrigation potential in these river bottoms. The energy opportunities being lost have probably hit the West African economy even harder. The downstream lakes behind two massive hydroelectric dams in Mali—Sotuba on a Niger tributary and Manantali on a Senegal tributary—are silting up more rapidly than anticipated. Estimates of the power-generating lives of both of these dams have been scaled back by a third (OMVS 2002) even though the hydroelectric career of one, Manantali, only began last year.

The archaeology of pre-colonial land-use trends (Fairhead and Leach 2000) shows that this concern for the irreversible impacts of rampant shifting cultivation is not new. Pre-colonial polities had common property practices such as sacred forests, which sought to restrain the land degradation impacts of survival. Fairhead and Leach (1996) argue that the village-based practice of savannah agriculture has historically added and protected more trees to such transitional West African ecologies than it has removed. Pockets of such agro-ecological stability spring up and grow wherever peace and economic security allow. Such stability, however, was and continues to be elusive. Population decline in the slave trading centuries (16th to 19th centuries) probably allowed many of these restraining agro-forestry practices to lapse.

Certainly those three centuries of disorientation left the way open for migratory pastoralists, mostly Fulani (Peulh), to move through and burn off the dangerous and expanding bushlands between the shrinking safety perimeters of dwindling settlements. In turn, these Fulani livestock thrived where there was more grass and less disease-vector harboring-forest. Furthermore, the uncertainty of slave raids favored the mobility of the livestock, as opposed to the sedentary crop, producer. Certainly, these livestock were more tradeable into the longer distance markets attached to the slave trade. Suret-Canale (1960/1964) attributes the rise of Fulani hegemonies across West Africa, in the wake of the declining slave trade (18th and 19th centuries), to their livestock’s compatibility with that long distance commerce’s appetite for live, and therefore less perishable and more transactable commodities.

Colonial rulers (Gov. Gen de l’AOF 1900:139) were quick to rue the Hobbesian dangers of this seeming land-use chaos of transhumant pastoralism and unbridled slash-and-burn agriculture. Fairhead and Leach (1996: chapter 8) show how this colonial “degradation discourse” became a self-serving orthodoxy even in the more stable Kissidougou enclave.

Elsewhere, vicious circles of degradation were seen as being compounded by every land-use change. For example, for a leading colonial geographer (Pelissier 1949:72), the sedentarization of the Fulani in the Fouta Djallon brought out the worst in both the pastoralist and the savannah agriculture adaptations:

There (in the Fouta Djallon) the lactophage nomad, of legendary sobriety, has not only sedentarized: he has at the same time developed a taste for the products of the earth; (thus settled) his inability to increase the yield from his herd obliges him to use them (towards political ends). If he has still not decided to farm himself to compensate for the increasing emancipation of his captive laborers, his wives, at least, have set an example to follow in practicing intensive (“Asiatic”) gardening on the “fabricated” soil (of the *tapade*).
[Translated by ARD from the French]

These remarkable and expanding *tapade* kitchen gardens are not the only example of rural women organizing for greater land-use sustainability. Landeck’s extension education dissertation (1991, MSU) shows how a participative sustainability dialogue could be developed with all statuses in Fouta Djallon society for each of their own land classification categories. Derman (1973), like the Land Tenure Center (1995) and Fairhead and Leach (1996) two decades later, shows how that dialogue cannot just be about the land categories themselves. Each social status group will have a perspective on how it can, or would like to, relate sustainably to each of type of land to which they might, or hope to, have access. Many of these status-group perspectives will be contradictory even where many of them will contain equal degrees of sustainability wisdom.

The LTC case study (1994) communities, seven out of eight of which were revisited (2003) by this GASA Team, showed how much of the logic behind these land classification systems is remarkably consistent across local languages throughout Guinea. Therefore, we propose to review land-use change aspirations, characteristic of each social status group, for the best studied of these local land-use categories, those of the Fouta Djallon (Landeck 1992, Diallo 1994, Barry 1998, Badie-Lavet 1998). This representative exercise should show us how a participatory land-use change dialogue can get beyond the “degradation discourse” inherited from the colonial period throughout Guinea.

In the Fouta Djallon the higher ground is divided between the *Hoore Fello* mountaintops, usually with their plateaux summits, and the *Fello (Falo)* slopes running down the lower *Bowal* plateaux flanks. These are the lower-value land categories where the practices of different status groups come into most conflict and cause the most damage, even though none of these groups intends to act out a “tragedy of the commons” and harm this upland landscape.

When the Guinean State began reestablishing forest reserves, having canceled the forest classification laws of the French colonial administration after independence (1959), the uninhabited *Hoore Fello* mountaintops were a popular choice. The surrounding *Fello* slopes, however, were less easily protected. Guinea’s poor farming majority—in the Fouta Djallon, the non-landowning ex-captive families—grow their upland rain-fed rice under slash-and-burn shifting cultivation regimes on these eroding hillsides. Livestock-wealthy landowners do not object to these slash-and-burn rotations as it keeps both their “rent” paying ex-captives fed and the fallow and dry season land open for their animals to graze. The ex-captive tenant farmers are perhaps less happy with these arrangements as those animals seldom distinguish between fallow and field as they graze (“divagate”) in the farming season. Even worse, for these tenant farmers are the restraints upon planting soil-conserving tree crops in the eroding, but still deep enough, soils of these *Fello* slopes. Under all operative customary and formal land tenure law, those trees would belong to the absentee landowner who would surely reoccupy the land once those trees began to bear fruit. The same disincentive can keep women from improving land “rented,” or even owned by their husband’s clan.

Building upon the LTC analyses, the Winrock PEGRN project (Fischer *et. al.* 1999) is beginning to neutralize these disincentives through the facilitation of a longer-term tenure “contract mechanism” between land owner and land improver that is now being upheld by local courts (Diallo 2003). This legal

bridge, combined with population pressure and the exodus of much male labor, has encouraged more and more women to settle *Fello* slopes, where a well or water source is available, and convert (or “*tapadize*”) slash-and-burn space into permanent kitchen gardens (“*n’dantapada*” or “*suntuure*”).

Moving downhill, we see how these *Fello* slopes plateau out into thin-soiled, “skeletal” *Bowal*. Rocky outcroppings and constant grass fires insure that this land is abandoned to the livestock all year long. Erosion can turn *Fello* slopes above and the flatter *Dantari* fonio fields down below into *Bowal*. Practitioners of the “degradation discourse” in the Fouta Djallon lament the “*bowalization*” of the upland landscape. But, in the rainy season, non-transhuming livestock stay healthiest on these denuded *Bowal* escarpments. Fires will continue to keep these *bowal* healthy until there are valuable trees on adjacent *Fello* (uphill) or *Dantari* (downhill) to protect from such fires, and there are theft-free stocking routes to drier areas as a healthy rainy season grazing alternative for these livestock.

Fulani livestock aspirations are not irrevocably inconsistent with the agro-forestry hopes of ex-captives for “rented” *Fello* or *Dantari* land, they just have to be realized at once, in concert, or not at all. Land-use planning dialogue between these different status groups is essential for such reciprocal realization, but outlet markets for both livestock and agro-forestry products also have to be functioning equally as well. USAID’s PEGRN project has resolutely taken upon itself, as guided by repeated evaluation recommendations (Hagen *et. al.* 1995, Eaton *et. al.* 2001, Scharr *et. al.* 2003), to combine local land-use dialogue with attention to output markets. Yet PEGRN was initially designed more for the former than the latter. PEGRN’s Winrock/Land O’ Lakes team, building on lessons from the producer organization movement (CIRAD 2001) and CLUSA (McGahuey 2003) and working with PRIDE finance, has done a credible job of encouraging market outreach for producer enterprises. But marketing efficiency also requires the sort of national policy and international linkage initiatives that most donors in Guinea have given up on.

Moving further downhill through the *Dantari* fonio flatlands, we enter the more valuable agricultural land area, the *Ley Bowal*. This is true home ground and therefore gets a more refined subcategory breakdown:

- *Hansanghere* where thicker soils are still interrupted (and held in place?) by intermittent rocks,
- *Woussore* where those rocks become mere pebbles, and
- *Hollande* where hillside depressions can catch water and, therefore support fruit trees and some rice.

These three subcategories of *Ley Bowal* will also be used to describe specific patches of *Fello* uplands if they are considered especially valuable and need to be more closely claimed as part of the *Ley Bowal* category of homelands. On such patches an ex-captive tenant may be expected to render more vigorous “rent” services, comparable to those offered for *Ley Bowal* land. Because of this stronger landowning claim, however, tenant farmers will shy away from planting trees on such *Ley Bowal*, even though its topsoil is deeper.

Finally, just before the potentially irrigated stream or swampland (*ayande/tyangol*), the rice, gardens, and fruit trees of the *dunkire* crowd out the fonio. Here, as in *Hollande* depressions, landowners will take an active role in planting fruit trees. This agro-forestry will intensify where water management infrastructure has been installed in the *ayande* bottomlands below. There are two reasons for this capitalization (“*embocagement*,” Badie-Lavet 1998: 183) of these lowest, *dunkire* slopes:

- These trees will help to regulate water flow into the irrigation infrastructure down below; and
- The rain-fed rice once grown upon and accelerating the erosion of the *dunkire* slope can now be reliably grown under the new water management regime in the *ayande bas fonds* below.

It is easy to appreciate the ecological and economic advantages of this reciprocal “*ayandeization*” (Barry 1998: 15) of annual cropping systems off of the slopes, *dunkire*, and above (now given over to agro-forestry “*bocage*”), and down into the improved water management infrastructure of the *ayande* bottomlands.

The sociological prerequisites of this transition are less obvious. Not just in the Fouta Djallon, but throughout Guinea, these bottomlands rarely “belong” to the families, or the social status groups (e.g., women) that are expected to farm them. But as these landowning families began to realize the income benefits of new agro-forestry on the *dunkire* slopes, and above, they will cede long-term access, on generous terms, to their tenant farmers in the irrigated *ayande* down below. To the extent that these landowning families bank their assets in livestock form, their animal husbandry will come into conflict with annual cropping on the rain-fed hillsides. If those staple cereals could be grown in a more concentrated form in irrigated bottomlands, the heavy labor of building hillside fences (a male chore) could be put into the lighter task of protecting agro-forestry seedlings and the greater returns from irrigation maintenance down below. If a few variables are changed, land tenure flexibility, irrigation investment, and markets for agro-forestry products, then a vicious degradation cycle can become a virtuous land reclamation one.

Land tenure politics and land classification semantics can both constrain or help to structure desirable land-use change. GOG/DNEF’s and USAID’s forest co-management approach (McLain 1994, DNEF 2000 and Catterson *et. al.* 2001) places a great deal of emphasis training for new organizational dynamics. But Christophersen and Bah (2001) caution that USAID’s assigned forest reserves may not have the economic potential to sustain these carefully orchestrated local organizational changes. They suggest that a simultaneous reorganization of land-use patterns in buffer zone agro-forestry might complete the needed benefit stream for the participating communities.

The EU is close to terminating its large forest co-management effort within the AGIR program to protect the Upper Niger and Gambia watersheds. The AGIR methodology sought to build upon indigenous land management and forest protection institutions, but in too many cases the appropriate, participatory dialogue could not be engineered between DNEF and those isolated communities. Higher levels of technical assistance have allowed for more fruitful dialogue around the PEGRN forests.

In Guinée Forestière, German (KFW) funding has placed two of West Africa’s last hardwood tropical forests under a sustainable use plan. Here the timber and non-timber benefits of this forest management may encourage more sustainable agricultural practices among the surrounding (“*riveraine*”) communities. In Nonah (one of the LTC 1994 case studies), for example, such forest income was invested in fishponds and had inspired the villagers to protect the forest from the depredations of refugees. In neither of these project examples, however, is equal attention being given to building, as Fairhead and Leach 1996 would recommend, upon the lifescape dimensions of the customary afforestation practices of these co-managing communities.

Does successful forest co-management have to be based upon agricultural sustainability? Keilbach, Duerr, Yansane and Diallo (2001) attempt a systematic quantitative review comparing gross margins between agriculture and forestry in Guinea’s four different regions:

1. In the Rice-Fonio-Fruit system of Guinée Maritime:
 - Annual crops offer a very negative (-355.2%) margin while perennial crops provide a very positive (228.6%) one;
 - The return on forest products is positive (64.8%) while that on livestock is the worst (-40%).
2. In the Fonio-Tapade-Livestock system of the Fouta Djallon:

- Annual crops give a gross margin of 26.5% while perennials only 10.3%;
 - Forest products are still positive (43.6%) and livestock offer their highest return (19.6%).
3. In the Rice-Tuber-Livestock system of Haute Guinée:
 - Annual crops command their highest gross margin (65.9%), while perennials get their lowest (8.6%);
 - The return to forest products is at its lowest (17.9%), but livestock remains positive (7.6%).
 4. In the Rice-Coffee-Livestock system of Forest Guinea:
 - Annual crops offer another negative (-100.9%) margin, while perennials a positive (116.5%) return;
 - Forest products are at their best (103.6%), of course, and livestock is negative (-19.3%).

Strong perennial agriculture correlates with good forest income. Where livestock returns are weak, the returns to annual crops are even weaker. Guinea's comparative advantage for forestry and agro-forestry should be clear from these estimates. In the Fouta Djallon, some of that advantage is consistent with an acceptable margin for livestock pursuits. The question to be explored is how to get more of Guinea's land and labor out of these poor margins for annual cropping, except in Haute Guinée, and into a more perennial agriculture?

This land-use change cannot begin until each community's rice, or fonio and sorghum, producing minimum is assured in a more reliable manner: usually through improved water management infrastructure. Such infrastructure is only feasible on plains and bottomlands owned by a minority of community citizens. Thus, some land-use arbitrage has to be introduced into the natural resources management plan of each community. Hillside farmers need to be given secure, contractual access to these bottomlands, or the GOG and the donors should not finance their irrigation improvements.

The details of this land-use arbitrage cannot be negotiated at as high a level as the sub-prefecture (CRD). The necessary land tenure contract mechanisms (cf. Fischer *et al.* 1999) have to be worked between specific farming households and organizations. Nevertheless, the remaining World Bank rural infrastructure projects (PNIR and PACV) are targeted upon CRD-level planning (LDPs). This need not be a problem if approval of any CRD irrigation-financing request is linked to a bundling of the sort of land-use arbitrage "contracts" at a more local, land management level.

Criteria for determining if those "contracts," as bundled at the CRD level, reflect an adequate and sustainable harmonization of the divergent agriculture and land-use interests of each community status group needs to be negotiated. This cannot be done until local knowledge about those social status groups, their particular agricultural aspirations, the land-use categories required for those aspirations, and the requisite market linkages is worked into the sustainable land-use plan to be operationalized by those "contracts." There is nothing in Guinea's National Soil Fertility Action Plan (MAEF 2001) that is inconsistent with this emphasis upon sustainable intensification (irrigation with inputs) and a decentralized approach to the involvement of producer organizations. That plan's recommended use of the negotiating agenda set up between the sub-prefecture CRDs and the World Bank's PACV funds (FIL and FIV) is also consistent with our recommendation. The technology transfer and input marketing emphasis in that plan is also welcome. But for sustainable land-use change to take root at the farm level, such broad brush objectives have to be combined with a deliberate methodology for working local knowledge and local aspirations into the final, legally binding land-use change arrangements.

Countless examples from across Africa have shown if the availability of infrastructure resources at a local level is linked to the elaboration of a participatory land-use change plan, then all concerned parties, communities, NGOs, and government services will take the time for an adequate stakeholder dialogue to unfold.

6.2 Gender Dimensions

Guinea has just completed its National Agricultural Census from which only a small set of very preliminary and very general findings have been made available. Two of those findings show that the economic empowerment of women has not significantly progressed in rural Guinea:

- The majority (51.6%) of Guinea's agricultural population is female and 62.6% of them list farming as their principal pursuit. Only another 9.4% are in school, while 20.6% of farm family males attend school instead of farming.
- Less than 6% of Guinea's 840,454 farms are managed by women as "*chef d'exploitation*." Over half of those female-headed farms have less than five workers, while only 21% of the male-headed exploitations are this small. Another 26% of male-headed farms have over 10 laborers bound to them.

This imbalance still does not capture two others weighing in on top of it:

- In addition to not managing 84% of the farms that most of them work on, these women spend seven additional hours a day on domestic chores: collecting over half the firewood and three-quarters of the water while doing all of the cooking.
- With the rural exodus of young males between the ages of 20 and 55, over half the agricultural workers left back in rural Guinea are women.

Templeman (FAO 2003) calls this the "feminization" of Guinea's agriculture. More and more young men are migrating out of the rural areas and out of the country looking for work, while over 30% of Guinea's GNP, agriculture, is being increasingly left to women. Yet these women are experiencing no recognized increase in authority over farm management or over agricultural land.

Women are thus isolated into the primary sector: agriculture. Even there, they are further isolated within agriculture, as their tentative access to male-owned land compromises both their land improvement options and any ability to command the other factors of production. These are not new findings, but as loudly and often as this gender imbalance is regretted, its recommended solution always seems to be sought, not where these women are, in agriculture, but elsewhere—in small enterprise and an improvement of health, education, and civic services for women. These non-agricultural efforts are reporting some important successes, although Guinean women's access to micro-credit, while improving past 20% of the total available, falls behind that level of participation enjoyed by their Malian and Senegalese neighbors. Nevertheless, neither the GOG nor the donors have even mentioned the need for a national strategy to empower women in their primary economic pursuit, agriculture.

Some interesting components of Guinea's rural development efforts, particularly the NGO-led programs (e.g., CLUSA, Africare, and OICI), have targeted certain promising agricultural activities of women. Some (CENAFOD and SARA) have led to the formation of successful groupings (producer organizations) of agricultural women. The PEGRN project is almost alone in Guinea in trying to address women's agricultural land tenure problem. Following the recommendations of Koenig *et. al.* 1993, PEGRN began to work on women's rights over, and appropriate inputs into, their own *tapades*. Now PEGRN is working out land tenure "contract mechanisms" for both landless males and women. These mechanisms are necessary because, even though women are not excluded from owning land under the Code Foncier of 1992 (Article 19), customary practice prevents it in most of rural Guinea. Nevertheless, fewer women are availing themselves of these and other PEGRN extension services than are male beneficiaries (Dembele and Dembele 2003).

With the support of the Sassakawa Global 2000 project the national extension service (SNPRV) opened up (1996) a *Cellule d'Appui aux Femmes Rurales* (CAFR) with links to the *Ministere des Affaires Sociales, de la Promotion Feminine et de l'Enfance*. CAFR is leading the development of a *Plan Cadre Genre et Développement Agricole* (PCGeDA) subtext linking LPDA II to Guinea's PCGeDA prepared after the 1995 Beijing UN Conference on Women. CAFR and Sassakawa Global 2000 together have helped some SNPRV equipment, credit, and other inputs to be targeted upon agricultural women and led the World Bank's agricultural export project (PCPEA) to support export chains for women's produce. Bank support to SNPRV and PCPEA has been terminated, and the PCGeDA, like its LPDA II parent document, has been superseded in donor discussions by the PRSP. The PRSP, as we have seen, barely mentions agriculture or women's role in it.

These oversights can be corrected as USAID joins the LPDA III analysis and dialogue.

6.3 Education

One of Guinea's biggest success stories of the last decade is in primary and secondary education. Enrollment has almost tripled from 310,064 students in 1990 to 790,497 in 2000. While 50% of these students were rural in 1990, only 47% of them are now. Nevertheless, there are now 213,775 more of them. The bad news is that too few public schools have teachers and those are only sporadically paid. Consequently, especially in more remote rural areas, private schools are springing up. With proof of CRD funds for teachers, the PACV will fund private as well as public schools, if that is the community's choice of infrastructure project. The percentage of students repeating year six is highest (60% on the average) in the poorest rural Prefectures: N'Zerekore, Faranah, Kankan, Kindia, and Labe.

Women's share in this educational gain was less encouraging, increasing to only 44.3% of the total by 2000. Most of this increase, of course, has come at the primary level. At the secondary level, the century ended with still less than 30% of classes female. Among the adult farming population only 20% of the women can read, compared to 44% of male farmers who are literate.

Agricultural education has become more confused as donor support to it and agricultural research has been withdrawn. Links to International Agricultural Research are also underdeveloped. On both scores a regional, multi-country knowledge management process is needed.

6.4 HIV/AIDS

Unfortunately, Guinea is catching up with its neighbors and has now reached 4.4% HIV prevalence. Elsewhere, this has been the jumping off point at which prevalence quickly doubles, and triples. Impressive AIDS awareness work, even in rural Guinea, may keep these percentages from going as quickly out of control as they have in other African countries. At present, Guinea's poorest regions, Fouta Djallon and Haute Guinée, still have fewer HIV cases. But as HIV prevalence moves up to the next level, poverty and infection can be expected to correlate more closely. In the meantime, more Muslim religious leaders in those poorer regions are alerting their congregations to the impending danger.

With neither a steady extension nor a rural market information system, Guinea's agricultural networks may not have too much of a contribution to make towards facilitating AIDS awareness diffusion. But the accelerating rural exodus of young males negates any contribution this economic isolation might make towards slowing down the spread of HIV to remoter rural enclaves.

On the farm, there is no good news to be had from this anticipated HIV onslaught. A rich literature on AIDS in rural Africa describes how coping strategies become struggling strategies as the HIV moves in. Best AIDS education practices for rural areas are well documented and appear to be as effectively applied as any other extension or adult education activity in rural Guinea.

Here, in this agricultural survey, we can only reiterate the well-known fact that HIV spreads more quickly among the malnourished. Thus, agricultural growth and market-driven crop diversification are going to slow down HIV as effectively as any other investment. The problem comes when AIDS, particularly as the HIV prevalence of women begins to catch up with that of men, begins to take adult labor out of the fields. This is when the practitioners of a low input, labor-intensive agriculture become more vulnerable to HIV than farmers living off of a land-intensive, irrigated farming system.

In this sense, then, the implementation of our recommended policy focus upon sustainable intensification of agriculture off of Guinea's eroding hillsides can play its part in restraining the spread of HIV.

6.5 Civil Conflict

We have recommended the elaboration of sustainable land-use harmonization plans, based on the land tenure "contract mechanism," at the farm community level as a precondition for PACV or other donor project funding of agricultural infrastructure (irrigation and/or farm-to-market roads) for that community. If they reduce erosion and increase agricultural productivity for these communities, these plans will have contributed towards prevention civil conflict in Guinea. Elsewhere in Africa (e.g., Rwanda), the intensity, if not always the precipitating cause, of rural violence has been attributed to land resource degradation.

On a larger scale, six of Guinea's seven neighbors (Mali excepted) have experienced some degree of civil war within the last five years. Consequently, in his sub-regional "Conflict Risk Assessment Report," Carment (2002, Carelton University) rates Guinea's risk (5.4) of civil conflict in the middle of this pack: just higher than Senegal's (5.3) and Gambia's (5.0), but considerably lower than Liberia's (6.4) and Sierra Leone's (7.2) rating. He sees Guinea's vulnerability compounded by "weak governance" and "low levels of human development."

Nevertheless, Guinea has avoided the sort of civil strife that is chronic to the sub-region. Will it remain the "last man standing?" A stronger agriculture and re-engagement with the Bretton Woods institutions would provide a better guarantee of stability. But to what extent can the current "stability" be attributed to the underlying potential of Guinea's fertile agricultural sector? In spite of all its recent commercial agricultural failures, over half of Guinea's half a million refugees have found some employment in local agriculture. There may be room for them in as Guinean agriculture sustainably intensifies (Bishop and Garnett 2000).

7.0 OPPORTUNITIES AND CHALLENGES FOR KEY AGRICULTURAL SUBSECTORS

7.1 Cotton

Subsector Overview

The international price of cotton will remain low as long as producers in the US are guaranteed a support price of 72 cents a pound while world market prices fluctuate in the 50-60 cents per pound range. The International Cotton Advisory Committee has estimated that the elimination of US subsidies would have the effect of raising average cotton prices by 11 cents per pound worldwide, equivalent to 15% to 25%, depending on the price of cotton at any given time. This massive subsidy (reported to be \$3.9 billion dollars for 2001-2002, more than the value of the cotton) is keeping US production high and insulated from world demand for cotton. Despite relatively low prices, some countries including Guinea can produce and make money-producing cotton provided crop production and ginning operations are carried out in an extremely efficient manner and marketing costs are kept to a bare minimum.

Cotton is a relatively new industry in Guinea, having started in 1984 growing gradually until 1992/1993 when almost 20,000 MT of cotton was produced. After a three-year fall of production to a low point in 1995/1996 to less than 11,000 MT, production increased to a record of 37,500 in 1998/1999 at its peak. Official figures and those given by the company for production since privatization (which show production rising to 44,000 MT in 2000; 54,000 MT in 2001; and 78,000 MT in 2002) are not credible. In fact, production apparently fell subsequently to 25,700 in 1999/2000 and 23,300 in 2000/2001 after a flawed privatization. Due to problems in paying farmers for cotton last year, farmers are shifting into other crops and cotton planting is way down for the 2003/2004 season, and low production will follow, probably not much more than 10,000 MT for the season.

Cotton is grown Haute Guinée as well as Beyla prefecture in Guinée Forestière and Gaoual, Koundara and Mali prefectures in Moyenne Guinée. Until privatization, cotton was expanding from Kankan right down to the zone where the savanna and forest regions meet. At its peak, more than 40,000 farm families were involved in cotton production. Yields per hectare were the highest in West Africa: 1,400 kg per hectare, higher than the *Compagnie Malien du Développement Textile* obtained in Mali (1,000 kg/ha), or than yields in Chad (750 kg/ha), Cameroon (1,100 kg/ha), or neighboring Senegal (a little over 800 kg/ha). Ginning was also efficiently managed with a 42-43% ginning yield.

Cotton's expansion to all regions even marginally suited to its production responded to two needs of farm families: to cover family food subsistence needs and to provide a large, on-time-per-year cash infusion to the family budget at precisely the time when fund flows from other sources are at a low ebb. Farmers' decisions to grow cotton are not made based on the revenue it brings in (which is low relative to other crops), but rather on other considerations. Farmers make use of the credit provided for inputs for cotton to produce other main season crops (mainly food crops). Farmers are also influenced by the fact that payment in the past came promptly during the first quarter of the year (allowing them to do on-farm holding of main season crops while waiting for better prices later in the year).

Based on its 50 years of experience in neighbor countries, *Companie Francaise du Développement Textile* (CFDT) had developed a technical itinerary well suited to cotton production in Guinea and transmitted it effectively to farmers. Cotton requires a heavy use of inputs (principally 200 kg or so of fertilizer and four to six applications of insecticides). It also requires animal traction and large labor forces from farmers with large families (15+ members) if large areas are to be planted (five ha or more). Credit was available through the company for financing input purchases for both cotton and food crops and the acquisition of

oxen and plows. Thus the development of cotton contributed to the overall development of agriculture, spilling over into main season food crops where farmers made use of the know-how obtained in cotton production and some of the inputs (fertilizer) and capital (oxen, plows).

Constraints

Although cotton is often the dominant crop in areas with low rainfall, other crops can compete. Vegetable gardening is profitable in all areas, and depending on conditions in specific areas, yams, sweet potatoes, peanuts, maize, and sorghum are also competitive. Plains rice is also profitable in many areas, though its production is limited by tenure issues and land access. The cotton-producing area has a low population density and limited labor force. Furthermore, gold mining also competes with cotton for labor but at the same time provides cash to finance inputs and equipment purchases (especially oxen and plows).

Since the industry was privatized, payments to farmers have been very slow and even the company's collection of raw cotton (a bulky crop for which farmers have no storage facilities) after harvest, took up to nine months. Thus the main incentives for farmers to produce cotton ceased to exist. As a result, production in one cotton area village (Nourosoubba) studied by the Assessment Team dropped from 180 ha to 60 ha as farmers quickly shifted into peanuts, rice, and root crops. Events since privatization have led to the collapse of the regional cotton federation, which had been strong until that time, as a result of its failure to obtain favorable treatment for its members from the CGC. In a similar vein, the company is losing staff members who are seeking jobs elsewhere due to the failure of the company to pay salaries for months at a time.

Opportunities and Potential Interventions

The cotton industry around the world is highly competitive and is increasingly dominated by international cotton companies working in an integrated fashion in several countries. Since the company is not making a success of its operation, the GOG should force its owner to sell the company or to reopen tenders for its privatization in a transparent and above-board fashion, limiting offers to multinational concerns with a track record of successful management of cotton companies elsewhere and strong ties with the international market. Since cotton is an industrial crop, growth in farm level production is impossible without a strong industry.

As part of its policy dialogue with the GOG on privatization, USAID may want to question the choice of a local rather than an international company to operate an industry important to the development of the northern region of the country. Cotton farmers have gained experience in the effective use of farm chemicals. PVOs assisting farmers organizations in cotton regions can make effective transfer of this knowledge to other crops (vegetables, rice, maize) and piggy-back distribution of inputs for commercially grown food crops on the input distribution and loan recovery system developed for cotton. In addition to better cropping and NRM practices, US PVOs have requested permission to be allowed to encourage fertilizer use and to steer farmers facing disease or pest attacks to SNPRV to obtain advice on appropriate pesticides to combat these problems and on safe ways to use them; this request should be granted.

No specific support is recommended for cotton development on the part of USAID. However, development of the regions in which cotton has been king and the moving force in regional development, is hard to conceive of in the absence of a strong cotton industry and given the major spillover effects increasing cotton production has on food crops for farmers with large families. USAID should work in concert with and support the efforts of donor and companies that are better positioned to revive this crop, once the political will is found to do so. The revival of the crop will also require reopening of the lines of two-way communication between farmers represented by a strong producer organization and the new company.

In most countries in Africa, seed is obtained from ginning, usually after delinting. There would also be a role for IRAG to play in conjunction with the CGIAR system in improving the quality of seed farmers use in the revival of cotton production. Likewise, seed from expanded production would serve as one of the feed stocks for a growing livestock feed industry.

7.2 Rice

Subsector Overview

Rice is the staple product in the Guinean diet in most parts of the country and is preferred to other products when available. Rice is produced on approximately 500,000 ha and on 80% of all farms. The crop is grown under a variety of production systems. LPDA II proposed to increase the area in rice from about 460,000 ha at present to 715,000 ha in order to achieve self-sufficiency in rice by 2005 and significant exports by 2010. This figure calls for improvements in water-control and drainage on 40,000 ha. However, LPDA II proposed achieving most of the increase in production at the extensive margin by expanding crop area rather than by intensifying production. Most current production comes from upland rice grown on plains and hillsides, and substantially more hillside land would have to be put into production for the LPDA II targets to be achieved. Considerable agronomic research has gone into upland varieties such as Nerika. Despite all the interest in rice, the kind of economic analysis needed to show whether or not Guinea has a comparative advantage in rice production has not in fact been done.

Table 9. Rice Area Yield and Production from 1995 to 2002

Harvest Year	1995	1996	1997	1998	1999	2000	2001	2002
Area	438,000	459,000	480,000	503,000	526,000	476,000	498,000	522,000
Yield	1,44	1,47	1,49	1,52	1,55	1,55	1,58	1,61
Production (paddy)	630,000	673,000	716,000	764,000	815,000	739,000	789,000	842,000

Source: DYNAFIV November 2003 reproducing SNSA statistics

Production Systems

Rice is grown under four main production systems:

Rain-fed upland rice occupied 312,000 has in 1997 and is by far the most widespread production system for rice production. Yields are low, generally less than 1.0MT. This system accounted for 65% of the area dedicated to rice.

Swamp (*bas fonds*) rice is cultivated in small valley floors throughout the country, usually during the rainy season since water availability and the alternative offered by vegetables limit dry season production. Current yields are reported at around one MT per hectare though yields four times that high are possible. Only a small fraction of the *bas fonds* are improved to provide water-control, and not all those that have been improved are still in service. This system of production accounts for 9% of rice crop area.

Joint production of fish and rice is a new subsystem of the swamp rice production system described above. Rice is starting to be produced in some aquaculture ponds in Guinée Forestière, with rice yields of three MT per hectare being obtained now, without sacrificing fish yield. Two rice and fish crops per year are possible, for a total yield in rice of about six MT. Rice is transplanted in the mud after the pond has been drained from the previous fish harvest. No land preparation is required. Water is brought up slowly and even dwarf varieties keep growing at a rate which keeps the rice heads 20 cm over the water; weeds are submerged and never get a chance to start. The area covered by this system is miniscule at present but has the potential to expand rapidly since the system has been proven in neighboring Côte d'Ivoire and has been thoroughly adapted to conditions faced by farmers in the N'zerekore region as well. The cost of

structures for joint production of fish and rice are estimated to be in the \$1,000-1,500 per ha range, with significant economies of scales for *bas fonds* where larger ponds can be created.

Plains rice is produced under a variety of subsystems with varying degrees of water control and corresponding variations in investment cost and yield. Current yields are reported to be around 1.5 MT. Most plains rice production is in Haute Guinée on large extensions and in an area where consumption habits include tubers and grains other than rice; thus a high percentage of this production finds its way to the market. Improvements in and the expansion of many small farmer systems is feasible where these changes lead to larger numbers of farmers benefiting from the scheme and where revenues from rice production rise as a result of these changes. This system of production accounts for 9%.

Mangrove rice has been grown in Guinée Maritime since the fourteenth century. This highly productive system makes use of nutrients brought in by the sea, low labor inputs, transplanting and soil protection measures to keep the land from becoming saline, acidic, and incapable of further production. Yields averaging 1.6 MT per hectare are currently being achieved and yields of three to four MT are obtainable as farming techniques and control structures improve. Small-scale systems tailored to farmer needs and their ability to maintain the systems without requiring annual infusions of outside capital to keep the systems operational. The system accounts for 16% of total rice area.

Investments in Irrigation and Drainage

Past investments in irrigation and drainage systems have ranged from \$7,500-9,500 per hectare for large-scale projects for mangrove rice; most of these projects have failed dismally after a few years. Many of them are abandoned in a short time due to salinisation, mineralization, and lack of maintenance.

Investment costs necessary to improve water control in *bas fonds* run between \$250 and \$2,000 per hectare, depending on the degree of water-control to be achieved. Despite investments farmers and others have made to improve *bas fonds* for production, some of these *bas fonds* have later been abandoned due to poor management practices.

Imports

Rice imports have averaged close to 270,000 MT over the last nine years, falling to 200,000 MT between 1996 and 2000 and rising dramatically to over 300,000 MT in 2001 and 2002. In 1998, imports covered 28% of the rice market; they rose to an average of 33% of the market over the 2000-2002 period. At present most imports come from the Far East; but additional imports will be coming from Mali, which is soon to become a net exporter of rice.

Per Capita Domestic Consumption

Rice consumption varies considerably by region:

- 100 to 110 kg per person per year in Guinée Maritime,
- 100 to 120 kg in Guinée Forestière,
- 60 kg in Moyenne Guinée,
- 50 kg in Haute Guinée.

The inhabitants of Haute and Moyenne Guinée have a diet based on a wider variety of cereals and a strong component of roots and tubers (cassava and yams) especially in the Kankan region. Even in Guinée Maritime, plantains are beginning to become a more important source of carbohydrates in the diet.

Constraints

The LPDA II strategy is not based on careful economic analysis of current production and marketing conditions for in Guinea and neighboring countries. For Guinea to achieve self-sufficiency in rice by 2005 and the status of a major exporter of rice by 2010 would require it to expand rice area dramatically since increased production is posited on increased area rather than higher yields. Most research and extension activities focused in the past on upland varieties (especially Nerika). The abominable state of roads (main arteries as well as rural and feeder roads) increases the cost of domestically produced rice in major markets (particularly Conakry) and encourages imports especially in Conakry and other main cities. Only a small fraction of *bas fonds* suitable for production of rice has been improved with necessary leveling, access to water, and proper drainage. Rice is but one crop in an intensive system of year-round production including vegetables and other crops. The domestic political situation makes it impossible to maintain a consistent policy of protection for rice. As a result, rice production has stagnated and imports have grown dramatically in response to cheap rice available overseas, high prices for local rice, and the failure to provide tariff protection to rice. Rice coming from Mali will soon add to imports from the Far East and will become competitive in nearly all parts of Guinea; therefore rice production is constrained by competition from uncontrolled imports and the almost total lack of tariff protection.

Yields

Paddy rice yields are reported to have risen from an average of 1,363 for the 1991-1993 period to an estimated 1,540 for the 1998-2000 period (a 13% increase). Rice (dehusked) production averaged around 525,000. Very little fertilizer is currently used on rice; some herbicide use is starting. It is not clear what factors could justify a yield this high.

Statistics on Rice Production

Official statistics provided by SNSA show continued growth and expansion of production, except for the military incursions in 2000. These statistics do not agree with import figures which have risen dramatically. Therefore official figures overestimate areas and production, probably by about 10-20%. FAO has adjusted average yields downwards from official estimates to 1500 kg/ha; even this figure may be high as yields in hillside systems which account for most of the area and most of the production also appear to be declining as the years of fallow continue to fall. Increased use of inputs and other technological changes are not sufficiently large or important as to provide a basis for purported increases in yields in other systems. The reexport of rice to neighboring countries (which has been credited with swelling import statistics) appears to account for only about 7.6% of imports and is virtually unchanged as a fraction of imports compared with previous years.

Processing

Rice in Guinea is marketed as rice not paddy, making the hulling of rice a major task for producers wanting to sell their rice. Most of this work is done by women employing a mortar-and-pestle system on rice they have previously parboiled. Parboiling makes hulling easier and makes the rice more attractive to consumers. Turn-out with locally available hulling machines ranges from 65-70% (averaging 68% and reaching as high as 90% with mangrove rice). These machines cost approximately Euro 1,000 (FG 2.65 million). There is an explosion in the installation of hulling machines whose numbers have risen from 200 in 1996 to 1,000 in 2001. About 20% of the increase has been financed by *Crédit Rural de Guinée*, with support from DYNAFIV project, which has a marketing finance component. These machines contribute greatly to reducing women's work in hulling, freeing up their time to engage in other more productive activities. As a result of this expansion, the cost of hulling declined by FG 20 in one area where the number of machines rose dramatically, spurring increased competition. However, this savings was negated as local authorities slapped on illegal taxes, negating the savings the new technology was providing to women using the hullers. DYNAFIV is helping rice hullers to organize to defend their interests.

Need to Reform Official Rice Policy

Official policy promoting self-sufficiency and exports of rice is an impediment to appropriate development of the rice subsector. A first step in reforming rice policy would be the admission that rice production is stagnating, that official statistics on rice overstate production, and that the unquestioning pursuit of the political desiderata of achieving self-sufficiency in rice has been made without regard to cost or economic underpinnings. There is also a need to recognize the fact that to achieve this goal would require sacrificing the income which could have been achieved in producing those crops for which the country or regions of it are better suited and expanding rice production would entail environmental degradation of additional hillside land better suited to perennial tree crops and forest. There is also a need to perform economic analysis of rice production, just as for any other crop, and to decide on the merits of expensive investments in building new irrigation systems for rice production based on their merits in economic terms and on their contribution toward improving skewed income distribution, partially redressing the unequal distribution derived from past investment in large scale projects for a few elite beneficiaries.

Opportunities and Potential Interventions

Support for Policy Change in Rice

The assessment concludes that the policy of rice self-sufficiency (and even the promotion of eventual rice exports) was misguided and wasteful of resources in an open economy such as Guinea's. Thus, the major tenets of LPDA II need to be questioned and rejected. Guinea's adherence to WTO makes self-sufficiency in rice an unreasonable goal. To show its interest in a better-grounded food and agricultural policy, USAID should support consultants involved in preparing LPDA III. It should encourage the GOG to recognize the stagnation of rice production, to accept this fact, and to redirect its own investment and that of donors exclusively to investment in rice production where it is economically viable. The GOG also needs to recognize that this goal could be achieved only at high costs in lost income from more valuable and better adapted crops, and that this change in strategy will obviate many major investments in a low-value crop which can easily be imported commodity. It will also reduce the amount and severity of environmental degradation that would be associated with the proposed expansion of hillside rice. Rice production should remain a small farmer crop and donors should not finance any more vast unworkable schemes to pay for investments whose benefits accrue only to an elite. Guinea should focus on intensifying rice production in those areas of the country where it has a comparative advantage for rice production, supplying domestic demand of nearby cities and mines where doing so is profitable for the farmers involved, increasing production on the land best adapted to rice (*bas fonds*, joint fish-rice systems, mangrove systems, and some plains) and reforesting hillsides in diversified permanent crops with higher value of production per hectare. More profitable crops like peanuts are supplanting upland rice in some areas. Hillside rice is both economically profitable and should be encouraged only in those areas where it is environmentally acceptable. For example, in some areas of Guinée Forestière, slopes are not too steep; in other areas rice is one of the crops which small farmers can intercrop in newly planted orchards to cover the costs of establishment of perennial tree crops.

Support for *Bas fonds* Rice including Joint Fish-Rice Production

In conjunction with USAID's new strategy which is anticipated to include the use of fertilizer and the appropriate use of crop protection chemicals where advised by competent local experts, rice yields can be substantially improved in *bas fonds*. With improved water control and protection of the areas from animals and other pests, well-adapted varieties of lowland rice constitute one of the crops to crop rotation system producing two or three crops annually, one of which may be rice during the rainy season. Yields in excess of three metric tons of paddy per hectare are achievable following joint investments by farmers and partner institutions in water control, farmer organization and improved cropping practices. These practices probably will include the use of fertilizer and may also require the use of other farm chemicals

where their use is advisable. Good local markets exist which will pay farmers good returns to their use of inputs and practices. Farmers will be able to meet part of their on-farm consumption needs and sell their surplus rice in nearby markets where some consumers are willing to pay premium prices for locally produced rice, even where imported rice is available.

Support is needed to increase production at the intensive margin on *bas fonds* operated by small farmers. This will require support to farmer organizations to help them to improve and manage the *bas fonds* with limited outside resources.

Support for Aquaculture involving Joint Fish-Rice Production

An aquaculture support program which included joint production of rice would contribute greatly to increasing farmer interest in intensive production under low input systems. The French-sponsored PPGF project has adapted technology proven in over 15 years of experience in neighboring central and western Côte d'Ivoire and elsewhere in West Africa to conditions in Guinée Forestière. A contract-based approach is used involving groups of individuals interested in aquaculture in *bas fonds*, their community and local authorities, and the project. Areas within *bas fonds* which are well adapted to aquaculture production are carefully surveyed, a pond establishment plan is developed, and it is put into practice over a period of several years. Well-designed pond systems permit complete drainage of ponds and breeding fry and stocking unsold fish in service ponds. Farmers learn to sex fish with over 97% accuracy, stocking only the males to increase production. The system produces crops of tilapia and another species (along with police fish, to keep reproduction and the population of intruder fish down). Fish production of nearly one MT per hectare per year (in two harvests) has been achieved. Marketing of the fish takes place a short distance from the pond; thus, marketing costs are non-existent. Marketing presents no problem in an area with no other source of fresh fish because of bad roads and lack of electricity. Prices of FG 2,000-2,500 for all sizes of fish were the norm in 2003.

In most of the ponds fish are grown in a joint production system with rice. After the pond is drained (to harvest the fish), rice is transplanted in the mud, now fertilized with the manure and other fertilizer used for fish production, uneaten fish food, plus the dropping from the fish. No plowing or other land preparation whatsoever is necessary. Rice grows rapidly maintaining its head 20 cms above the water level which is raised gradually during the course of production. Weeds are eliminated by the rising water (no pesticides are used). Yields in excess of 2.5 MT of paddy per hectare have been achieved at each harvest (two harvests a year), for an annual production of five MT per hectare.

Pig production also fits in well with this system in an area like Guinée Forestière where Christians and animists predominate, and where the market for pork is good.

Investment costs are on the order of FG one million or more per hectare and are currently borne by initial participants, who tend to be retired civil servants or other members of the local elite. Because the system is highly profitable, means could be devised as part of USAID funding in support of aquaculture to allow small farmers to participate by credit finance of part of the construction costs.

Replacement of Hillside Rice Production with Viable Alternatives

Production on steeper hillsides should be discouraged and replaced where possible with permanent crops which produce on a sustainable basis while protecting the hillside from degradation; in some areas upland rice production during the development phase may be reasonable strategy to provide income to cover the costs of establishing perennial tree crops.

Support for Small-scale Mangrove Rice

Small farmer-managed mangrove production systems should be encouraged, since this is the most productive of all systems even with few or no inputs, and their stabilization reduces the need of farmers to

shift cultivation destroying new stands of mangroves in the process. For six hundred years, farmers in Guinée Maritime have been producing rice on small village perimeters taking advantage of tidal inflows bringing natural nutrients from the sea and alluvial flows of rivers, rainwater to leach out salt and minerals, and small water control structures to maintain water levels during the growing season. Imitation of village systems by the GOG projects on a vast scale with huge dikes and water control structures to exclude the sea on a permanent basis have failed due to their inappropriate scale, which is beyond the capacity of groups of small farmers to operate and maintain. The land is subject to rapid acidification, mineralization, and desertification. However, building on the experience of small-scale village systems, small projects have been established and are well documented. It has been shown that production with no inputs other than seed can be achieved with sustainable yields of three MT of paddy or above, year after year. Many small systems of this type can be established in areas of Guinée Maritime in close proximity to markets (mines and Conakry) well able to afford premium prices for a type of rice (*etuffé*). Nutrient needs are provided for by the sea; water control makes herbicides unnecessary in most cases. Sustained use of the same perimeters reduces the incentive for farmers to destroy more mangroves by slash-and-burn agriculture, reinforcing other USAID objectives to sustain natural resources and protect the fauna of coastal Guinea.

Support for Private Sector Fertilizer Distribution System

Building on NRM systems which have already improved organic matter and soil structure, the use of chemical fertilizer (to which rice is one of the most responsive crops) should be encouraged so that production is concentrated on smaller areas and returns are higher to farmer investments in NRM technologies, materials, other inputs, and labor. Japan should be asked to stop its KR2 fertilizer donations, which distort the legitimate fertilizer market and have a corrupting influence on the Agricultural Chambers of Commerce. The development of private sector distribution of fertilizer and other farm chemicals is being delayed by the prolongation of this policy, which is out of step with present conditions in Guinea. As it is doing in other countries (such as Malawi), USAID should actively support the development of a network of private fertilizer dealers to make fertilizer available to small farmers for rice as well as for vegetable crops.

Support for Investments in Small Farmer Plains Irrigation Systems

Modest investments should be made to improve water-control for small farmer groups involved in plains rice production.

Support for Small-scale Rice Hulling Mills

Rice in Guinea is sold as rice, not as paddy. There is no major milling industry such as is found in most countries in Southeast Asia. Rice is hulled manually by pounding it mortar-and-pestle style; virtually all this work is done by women. As production rises on productive systems that USAID will be supporting, there will be a localized demand for small-scale husking machines to reduce the labor of women in pounding rice. Some US PVOs are already assisting individual small businessmen and women to plan these small operations and help them find ways of financing them. Support may also be needed for establishing small husking mills. DYNAFIV has discovered that group operation of these machines is usually unsuccessful and is not recommended. DYNAFIV's own program has been successful in promoting privately-owned hulling machine operations to get established; this program deserves additional support and encouragement to link with and provide its expertise to US PVOs promoting rice production as part of their work.

Dietary Modification Program Linked with Other SOs

Health and Nutrition and Education SOs should include components encouraging dietary change to make better use of plantains and the various tuber crops that are well adapted to large parts of Guinea in replacement of part of the dietary requirements for rice. School canteens and school gardens should contribute to this dietary behavior modification program by incorporating these products into the school

lunch program. Similarly, the focus of food security projects should change to more cash and commercially oriented production and to the incorporation of products well suited to local production and marketing conditions other than rice in the farming system.

7.3 Tuber Crops

7.3.1 Cassava

Subsector Overview

Cassava is second only to rice in the Guinean diet. While the root itself is low in protein, when eaten in combination with sauces made of fresh cassava leaves (as is often the case in Guinean cuisine), protein content is significantly enhanced. At average yields obtained in Guinea, cassava provides over three times the calories per hectare as does rice, more than twice those of maize, and more than five times the calories of a hectare of fonio. Cassava does better than other crops even in the face of adverse growing conditions and, on average, has yields that are significantly higher than alternative crops.

Table 10. Comparison of Average Yields of Various Crops

Crops	Cassava dried	Peanuts (hulled)	Dry maize	Rice (paddy)	Fonio paddy
Avg. yield (MT/ha)	3.13	0.81	1.29	1.31	0.86

Source: DYNAFIV

Gross revenues per hectare are also higher than for alternative crops, twice those of rice and cotton, and three time that of fonio. It should be mentioned that the comparison for these crops, including rice is for nationwide average yields; in the case of rice, this overestimates yields for non-irrigated land where cassava competes on favorable terms with upland rice whose yield is often less than one MT/ha.

Table 11. Comparison of Gross Revenue Based on Average Yields of Various Crops (1998)

Crops	Cassava	Peanuts	Maize	Rice (paddy)	Cotton	Fonio
Gross Revenue (FG/ha)	638,000	430,000	360,000	320,000	250,000	200,000

Source: DYNAFIV

Cassava is well adapted to all four regions of Guinea. It is tolerant of poor soils and drought. It is the most important of the root and tuber crops and plays an increasingly important role in food security. By 1998, production had reached over 775,000 MT produced on about 123,000 ha. Between 1992 and 1998, production rose by 82% while crop area more than doubled; thus, increases came from expansion of area planted rather than from higher yields.

Cassava is produced under three production systems: exterior fields, tirades (kitchen gardens), and *bas fonds*.

Exterior fields are located at some distance from the farmers' homes (cases). Cassava is cultivated on slopes and plains, in association with maize, rice, peanuts, and okra. It is either hilled or planted level with other crops. Cassava is often intercropped with immature fruit trees to generate some income during the development phase before fruit production begins. Cassava's position in the crop rotation varies from first in Haute Guinée to the last crop before fallow period in Guinée Forestière.

Tapades: Cassava is cultivated in parcels around houses in Basse and Moyenne Guinée on raised hills and is associated with other crops (sweet potatoes, vegetables, and taro). Tapades are used as a continuous production system with no fallow periods, being fertilized by household wastes and animal manure. Yields are low (two to four MT/ha).

Bas fonds are important as production areas for leaves as well as for fresh roots. Such parcels tend to be small (averaging 0.31 ha). Cassava is grown in a pure stand. Where fields are subject to inundation, cassava is planted at the end of the rains or after harvesting a crop of rice (as is also the case in Sierra Leone). Unlike cassava grown in the *tapades* for home consumption that grown in *bas fonds* is destined for the market.

Yields vary from four MT in the Boke region to eight MT in N'zerekore. Average yield nationally is 6.3 MT. Production from Kankan is sold as dried roots while that coming from N'zerekore is sold fresh. Both forms are sold to supply the major cities in Guinea as well as being exported to Mali, Senegal, and the Gambia. Additional production comes from the Basse Côte and Moyenne Guinée. Kindia produces dried cassava during the dry season for the Conakry market. Areas around Conakry (Forécariah, Coyah, and Dubreka) supply Conakry with both roots and leaves year-round. Cassava and cassava leaves are consumed in a variety of forms in Guinean cooking.

Small producers sell some cassava as the need arises since cassava stores well in the ground until harvested. Larger producers enter into arrangement with large and wholesale traders who have developed important trade links with neighboring countries (Mali, Senegal, Guinea-Bissau, and the Gambia). Sweet varieties of cassava dominate the market, with little bitter cassava entering the marketing chain.

Constraints

Production

Land tenure issues and access to land on which to produce cassava limits production in many parts of the country. Competition between producers and owners of free-ranging livestock also is the source of frequent conflicts.

Storage

Cassava root has a high water content (70%), which means transport costs are high for fresh cassava. It also means that for cassava meant to be preserved, some form of processing needs to start within 72 hours after it is harvested. The most common form of preserving cassava is by drying it. However, after three months dried cassava is highly vulnerable to insect attack, and all participants in the marketing chain from farmers, to traders at various levels, to final consumers are affected. A few people grind dried roots and then store cassava flour in hermetically sealed plastic bags, being able to store the product and keep it safe from damage by insects for many months. Farina and gari also store well but for the most part, gari (which is the major product) is imported from Sierra Leone.

Processing

The traditional processing method used by most women is to turn cassava into *attiéké* by a long process involving drying, grinding or pounding, and fermentation. However, knowledge on how to do this process correctly is not widespread. Another limiting factor is the availability of grinding mills which are scarce (one mill for each 7,000 people), especially in rural areas.

Opportunities and Potential Interventions

Both the domestic and regional markets for cassava are favorable. Promotion of cassava as a substitute for rice would speed up the ongoing substitution of cassava in its various forms for part of the rice consumed in the Guinean diet. Increases in the price of rice favor this substitution into cassava as an alternative

source of carbohydrates. On the production side, there is an opportunity to introduce short-cycle sweet varieties (less than eight months). Better fencing will be needed, especially for cassava produced for the market.

Women need training in how to produce good quality *attiéké*. Starch production may also be profitable given the number of women engaged in dyeing operations. Commercial uses of starch are also possible, though experience in other countries indicates that competition from other sources of starch is strong.

Improvements in roads and in the organization of marketing, particularly for fresh cassava, can contribute to expanding the size of the market for this product as more distant markets are reached with a quality product at a competitive price.

7.3.2 Sweet Potatoes and Taro

Subsector Overview

Sweet potatoes and taro are other crops that replace rice in the Guinean diet. In addition to the tuber, the leaves of sweet potatoes are consumed fresh in sauces. One advantage of sweet potato production is the fact that some of the leaves can be harvested and sold within two months after planting; this early contribution to cash flow makes the crop more attractive to producers. Sweet potatoes are short cycle crops reaching maturity within four months.

According to the figures given below, the production of sweet potatoes and taro has grown dramatically in recent years; however, as is the case for other crops which substitute for rice, doubts exist concerning the quality of the data. Sweet potato production is thought to have averaged about 20,000 MT per year until recently; yields average in the range of six to seven MT/ha. Taro production is said to be on the order of 30,000 MT. Much of the production of both sweet potatoes and taro is concentrated in Moyenne Guinée which is the first ranking region for the production of these crops. In Moyenne Guinée, little rice (either domestic or imported) is produced and products like sweet potatoes, taro, and cassava constitute the mainstay in the local diet, occupying the place taken by rice in other parts of Guinea.

In addition to the local market, exports of sweet potatoes are confirmed to be going to Senegal and the Gambia (via Koundara). Tiny amounts (less than one MT) were reported being exported to France in 2001. A small amount (300 kg) of dried sweet potato leaves was also reported in 2000.

Table 12. Production of Sweet Potatoes and Taro

Year	1995	1996	1997	1998	1999	2000	2001	2002
Prod. MT	42,000	45,108	48,445	57,255	63,484	70,391	78,050	95,958

Source: SNSA, December 2003

Constraints

While potatoes, if properly stored, can last for some months, sweet potatoes deteriorate rapidly after harvest. Under normal conditions they rarely can be stored for more than a week, and in the best of cases (and only rarely) they can be stored for a period as long as two months. Unlike cassava, no cost-efficient processing technology has been developed, while numerous technologies for processing and storing cassava exist and are widely practiced. Because they cannot be stored, any market glut has no outlet and therefore prices can fall drastically as a result of relatively small oversupply situations.

Opportunities and Potential Interventions

There may be some opportunity for exporting sweet potatoes and sweet potato leaves to Europe.

7.3.3 Yams

Subsector Overview

Yams are cultivated principally in Kankan and Mandiana in Haute Guinée, particularly in the southern part of the region) as well as in Sinko in Moyenne Guinée and Beyla in Guinée Forestière. Production for the local market was observed during fieldwork in the N'zerekore area. Yams are being taken up by farmers in the Kankan region in replacement of cotton who are rapidly abandoning cotton production. Yams are among the crops they are substituting into due to dissatisfaction with payment delays which have arisen since the *Compagnie Guinéenne du Coton* which was privatized three years ago.

Statistics indicate a dramatic increase in production in recent years. These increases are believable when confronted with other data indicating increased farmer interest in the crop.

Table 13. Production of Yams

Years	1995	1996	1997	1998	1999	2000	2001	2002
Prod MT	21,600	23,198	25,000	29,444	32,648	36,200	40,139	49,351

Source: SNSA, December 2003

Yams are being exported by land to Mali and Senegal and to Sierra Leone and Liberia as well. Official export figures for Conakry list two small container (20 MT in total) being exported in 1999 to Spain and a smaller amount to France in 2000. In 2001 and 2002, a few hundred kilos were exported to France and the US. Small amounts have also been sent to the UK. Additional exports through the port that are not labeled specifically as “yams” may also have occurred.

Farmers in Kankan have asked Bordo research station to produce planting materials and to provide them with advice on cropping practices.

Constraints

Yams require a high percentage of planting material to final crop (10%), unlike cassava, which is propagated by stem cuttings, or sweet potatoes, which are rooted from leaf cuttings. From a farmer's point of view, a high percentage of potential crop sales have to be sacrificed to provide seed for the following year's crop. Thus expansion of the crop is far more difficult and costly than for other root and tuber crops.

Yams also require a high labor input. In that respect, yams are similar to cotton.

Opportunities and Potential Interventions

With the coming of peace to Sierra Leone and Liberia, expanding exports to these countries is feasible. Farmers are asking for assistance, indicating that they feel the crop is profitable.

One potential intervention would be to do market studies of neighboring countries and perhaps in Europe and the United States to determine potential demand and customer requirements.

If the crop does show good potential, it would require some support in terms of market information in major markets in Guinea as well as in neighboring countries, crop area and production statistics, and periodic market outlook studies. Price reporting and proposed market volume reports done by ACA for domestic markets could be expanded to cover major foreign markets for yams and other products;

initially, the major markets of Dakar and perhaps Bamako could be targeted for this type of reporting.

Another intervention would be to work with research stations and top producers to make available a supply of good quality planting material to permit interested farmers to expand their crop areas to meet projected increases in demand.

Research may also be able to help in coming up with cropping practices (such as herbicides) which allow farmers to reduce labor inputs in a cost-effective way without endangering consumers.

Steps also need to be taken to minimize unnecessary delays in getting products to market. These include improvement in trunk roads, encouragement of authorities to reduce interference with the free transit of yams and other perishable products, and encouragement of expeditious handling of products at ports and border crossings.

7.4 Peanuts and Other Oilseeds

7.4.1 Peanuts

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.4.2 Sesame

Subsector Overview

Sesame is grown all over the world in the same areas as cotton. Its principal use is as cooking oil or for confectionary purposes. Two types are recognized (black and white) and a large number of varieties exist within these two types. Black varieties are used mainly for pressing for oil. White varieties are used for confectionary purposes. The principal market is the United States. Other major markets are Europe, the Middle East (Turkey, Lebanon), and Japan. The major enterprises dominating sesame production and marketing of sesame are located around the Caribbean basin (Texas, Mexico, Guatemala, and Venezuela).

In the West Africa region, sesame is produced in significant quantities in Senegal, Burkina Faso, and Mali. Sesame is also produced in the Gambia and neighboring Casamance as part of a Catholic Relief Services project. This project started at the wrong end of the chain, focusing initial efforts on agronomic concerns and production constraints; as a result farmers produced significant quantities of sesame but have had serious problems in marketing their production. An organization (NAWFA) has been set up to market sesame in the Gambia to brokers and traders in Senegal.

Constraints

A farmgate price \$300 per ton for sesame with a 50% oil content, less than 1% impurities and less than 1% free fatty acids was quoted in the Gambia for December 2003. Lower prices are paid in Mali, consistent with higher transportation cost to the port (Dakar), and a carry-over stock was still unsold in late December 2003. There is considerable price fluctuation in the market for sesame and occasional problems in finding a buyer at prices covering the cost production.

Opportunities and Potential Interventions

Establishing contacts with buyers, developing agreements with them, and then taking all necessary steps to preserve good relations are essential to the development of this crop. If a dependable market for sesame is assured, production constraints can be dealt with by the agronomic know-how that various PVOs throughout the country are already providing farmers' organizations for other crops. Selecting the right type of sesame (white) and a good performing variety is the key to market-oriented production. The fact that farmers now grow very little sesame and what little they grow is white may be a plus factor in the

establishment of sesame as an export crop since they can be expected to grow pure stands of white sesame using for the most part whatever seed is provided. Where farmers already grow the crop on a small scale, its development as a truly commercial crop is harder rather than easier. For example, Export Marketing Company in Mozambique reported problems with sesame grown under contract with farmers assisted by a US PVO, CLUSA (Mozambique), and harvested in 2003; farmers produced white sesame from seed provided them but topped up with sesame grown from their own (black) seed, providing a mixed product which did not meet contract specifications with Export Marketing Company and its contract with final buyers. Marketing the crop would depend on meeting quality and quantity specifications called for by the buyer(s). International prices fluctuate but white sesame always retains a positive price differential with respect to black sesame.

Any one of a number of marketing-oriented US PVOs (ACDIVOCA, CLUSA, Enterprise Works, or TechnoServe) could develop this crop. It would start by developing the marketing connection and then assisting farmers directly or training other PVOs in production, quality, and other issues needed to produce and market a product of high, uniform quality for the market connections which will by then have been established. Traders from the Gambia and Senegal have expressed interest in this product with production from Guinea increasing their volume and providing economies of scale in their operations. It is also possible that Lebanese traders in Guinea may have contacts of their own in the Near East, which is one of the major markets for sesame, and may also be able to market the product. Collaboration with similar programs funded by USAID in the Gambia and Mali are also possible.

Sesame farmers should be encouraged to diversify their production to include other commercial crops in case international prices fall and make further production of sesame unprofitable. Farmers would be ill-advised to specialize exclusively in sesame production for their source of cash income.

Although development of the crop requires a crop-based (*filière*) approach from the point of view of a donor agency like USAID and the operator selected to develop the product, from the point of view of the farmer, sesame should remain only one of a number of commercial crop alternatives and retained in the farm production plan only as long as it continues to contribute to overall farm enterprise goals.

Sesame should be sold as produced for the market and no attempt should be made to develop an oil production capability as was done in Mozambique after the war when no domestic oil industry existed. In Guinea the national oil market well-served by palm oil which is in frank expansion and whose development should be promoted both to serve domestic oil consumption needs as well as to meet export demand within the region and elsewhere.

7.5 Corn, Millet, and Sorghum

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.6 Oil Palm

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.7 Fruit and Tree Crops

7.7.1 Cashews

Subsector Overview

Cashew trees are found all over the world having originated from trees discovered by the Portuguese in Brazil in the 1500s and carried to their other colonies around the world (Goa in India, Mozambique, and Guinea-Bissau). However, cashews did not become important in international commerce until the 1920s.

While world production of raw cashews was only 500,000 MT in 1984, it has reached 1.6 million MT in 2001.

The main producer countries are India, Brazil, Tanzania, Indonesia, Mozambique, Nigeria, Sri Lanka, and recently Vietnam. In Africa, the major producers Tanzania, Côte d'Ivoire, Mozambique and Guinea-Bissau; Kenya also produces some cashews along the coast, and small amounts are also produced in northeastern Uganda for sale on the local market.

World Market for Cashews

International trade in cashews is in two levels and forms: raw cashews and cashew kernels. International demand for the finished product (cashew kernels) obtained by roasting and shelling raw cashew nuts, is concentrated in the United States, Holland, Japan, the United Kingdom, and the Middle East. India, Brazil, and Vietnam are main producers of raw nuts and all three have major industries which process their own production of raw cashews into kernels. India and Vietnam in most years also buy additional raw nuts in the international market to keep their processing industries fully employed when their own harvests are low or fall short of expectations and during the months before their harvests come in (March and April). Thus demand for raw cashew imports is affected, sometimes dramatically by production conditions, in these countries. Vietnam is the new entrant to the industry as both as a producer and as a buyer of raw cashews.

Producers

In Africa the major producers are Mozambique, Côte d'Ivoire, and Guinea-Bissau. Annual production in Côte d'Ivoire is on the order of 80,000 MT and 50,000 MT in Guinea-Bissau. Guinea's production is estimated at slightly more than 3,000 MT. Mozambique and Tanzania which dominated the world market in the 1960s have fallen to just under and just over 10% of world production. Vietnam, which had a production of only a few thousand tons at the beginning of the 1980s (only slightly more than Guinea's current production), is now the second producer in the world with 272,000 MT in 2001. Mozambique which had over 200,000 MT in the 1960s is now producing around 50,000 MT and now has only about 5% of the world market (down from 40%) as a result of policies which prohibited raw cashew exports to support an antiquated processing industry; value-added was actually negative in some processing factories as a result of low turn-out of whole nuts, poor technologies and inadequate organization of production. Nigeria has gained market share (now about 12%) in recent years.

Raw Cashew Exports

Raw nut exports average 150,000 MT a year between 1961 and 2000; exports have exceeded 200,000 MT every year between 1993 and 2000, and in 1999 exports reached 437,000. The average price in recent years has been around \$550 per MT. There is some volatility in the export market for raw cashews dependent largely on the state of the Indian harvest. Historically, Tanzania is the world's biggest exporter of raw nuts (44%) despite having a processing industry with the same unprofitable technology as that of the Mozambican industry but which it never put into operation. Guinée Bissau is next in terms of raw cashew exports (12%), followed by Côte d'Ivoire and Indonesia, each with 8%. Nigeria and Benin have 6% and 5%, respectively, of world exports. Even the Philippines, with annual production of 3,500 MT (slightly more than Guinea), exports nearly its entire product in raw form. Until recently, nearly all these raw cashew nut exports went to India.

Raw Cashew Imports

Over the 1961-2000 period, India accounted for three quarters of all raw cashew imports, although Vietnam has also come into the market in recent years. Total imports since 1990 were over 150,000 MT each year with the exceptions of 1997 and 1998 when imports fell to below 50,000 MT. The Former Soviet Union also imports on the order of 10,000 MT per year; in recent years Brazil has been importing

raw cashews nearly every year since 1994 with tonnages averaging 8,500 MT in the years where imports are registered. Canada also imports some raw cashews since 1994.

Cashew Kernels

The major market for cashew kernels is the North American market, which still accounts for more than half the market for cashew kernels (shelled cashews). Demand is increasing dramatically in China and Australia/New Zealand and substantially in Western Europe and Japan, while increasing moderately in the rest of the world. Prices for cashews are quoted in dollars for a standard grade W320, for whole nuts of a certain caliber. Larger whole nuts sell at a premium, smaller nuts at a discount. Splits and broken nuts have a significantly lower price than do wholes. Scorched nuts are also penalized in price.

Nuts are exported vacuum-sealed in plastic or aluminum and packed in 50-pound cartons.

Table 14: World Cashew Kernel Imports (in metric tons)

Region	Year		
	1990	2001	2002
North America	57,068	86,364	102,273
Western Europe	15,455	37,841	38,636
China	-	14,205	12,955
Japan	4,318	6,364	6,591
Australia/NZ	2,818	7,273	7,955
Others	18,091	22,955	25,909
Total	97,750	17,500	193,182

Prices for cashews are quoted in dollars per kilo for a standard grade W320 (320 cashews per pound), for whole nuts of a certain caliber. Larger whole nuts sell at a premium; smaller nuts sell at a discount. Split and broken nuts have a significantly lower price. Scorched nuts are also penalized in price.

Since cashew turnout is about 22.5% (raw nuts to kernel), prices for kernels would have to be 4.4 times higher than for raw nuts if production costs were negligible. The difference between 4.4 and the differential represents the processing margin for processors in India. Processors in other countries have an additional margin represented by the marketing margins of exporters and transportation costs to India for raw nuts, three quarters of whose weight is lost on processing.

Table 15. Prices and Differentials for Raw Cashew Imports and Kernel Exports for India

Unit	Year				
	1961	1970	1980	1990	2000
\$/MT Raw Cashews	155.0	234.0	461.0	908.0	858.0
\$/MT Cashew Kernels	957.0	1,373.0	5,500.0	4,962.0	5,125.0
Differential	6.2	5.9	11.9	5.5	6.0
Price per kg	0.96	1.37	5.50	4.96	5.13

Prices per kilogram fell sharply in 2001 and 2002. Nevertheless, Vietnam still was able to export its 2002 output of kernels (60,000 MT) at \$3.30 per kg.

Worldwide Production

Worldwide raw cashew production has grown dramatically since 1987 when it was 350,000 MT to the present 1.18 million MT; the entry of Vietnam since the late 1990s now adds 220,000 MT to world production. Worldwide yields averaged 550 kg/ha between 1960 and 2001. Variation between countries is considerable. The lowest yield reported in West Africa is from Benin with 120 kg/ha; Senegal achieves 800 kg per hectare. Yields in Guinea-Bissau are 1,200 kg/ha. Average yields in Guinea including Guinée Maritime, which borders on Guinea-Bissau and Haute Guinée (Mandiana, Kouroussa, and Sigiri) on the border of Mali and Côte d'Ivoire should reach close to 1,000 kg/ha.

Cashew Production in Guinea

Cashews were introduced during colonial times by the Department of Eaux and Forêts from Mozambique; part of this seed was deposited at the research level at Foulaya station in 1947. Cashews were planted by the Department of Eaux and Forêts NRM program to protect springs and hillsides against erosion, as boundary plantations around protected forests to reduce the risk of fire (since cashew trees are fire resistant). The focus of these plantations was on reforestation. The Department of Eaux and Forêts disseminated a series of taboos and old wives tales designed to keep the population from cutting down the newly planted trees to plant crops and building villages where plantations had been established. Among these are the following:

- eating cashews and milk causes death;
- cashew trees emanate a gas at night which causes death to people living in houses nearby; and
- for a Muslim to cut a cashew tree was a guaranteed ticket to hell.

While these taboos may have been successful in protecting cashew forests, they discouraged looking seriously at the crop's commercial potential. Overcoming these prejudices has been part of the task in the promotion of cashews as a commercial crop in Guinea. In some areas, cashews in Haute Guinea are still planted as live fences because they are tolerant of drought and fire-resistant, protecting the crops planted inside the fields they surround from both animals and fire, with no apparent thought to their commercial value if planted as a perennial tree crop.

Only in Guinée Maritime have farmers known about cashew as a crop, as a result of their ethnic, cultural and commercial ties with neighboring Guinea-Bissau, which is one of the major producers and exporters of raw cashews in West Africa. However, their cashew plantations have been established with seeds obtained from Guinea-Bissau and with no technical assistance on proper plantation design, technology, or maintenance.

Main cashew-producing areas of the country are Guinée Maritime and Haute Guinée. In Guinée Maritime, production is concentrated in the Boke area. In Haute Guinée, most production is found in the Kankan region (Mandiana, Kankan, Kouroussa, Sigiri, etc); cashews are also grown commercially around Leluma in the Fouta Djallon. There is also production of about 700 MT in the Konia area and the Beyla prefecture near the Ivorian border with 1,200 ha; they have received the seed from an Ivorian enterprise SODIRO. SPCIA has detailed breakdown on areas and producers should these be necessary. The total area under cashews is approximately 25,000 ha. There are 5,000-6,000 ha in Guinée Maritime, and 20,000 ha in Haute Guinée, and additional small plantations in the Leluma area of the Fouta-Djallon. Most of the plantations in Guinée Maritime were done by farmers themselves with unimproved seed from Guinea-Bissau and without the benefit of technical assistance; yields are therefore extremely low. Plantations in Haute Guinée are mostly new and have for the most part benefited from technical assistance; most plantations are new and not yet in production. Current production for the 2004 harvest is estimated at 3,300-3,500 MT in total, but is rising fast.

Establishment of Commercial Cashew Production in Guinea

Commercial cashew production is occurring spontaneously as well as being promoted by various projects (PADER and the Sustainable Tree Crop Project). The operator for this program is SPCIA (*Société de Production et Commercialisation d'Entrants Agricole*). Its program activities are in both Guinée Maritime and Haute Guinée and involve a package of technology and farmer organization support, with a component for small-scale processing operated by Enterprise Works which has programs in neighboring countries (Senegal, Guinea-Bissau). At the present, yields are still quite low since most plantations are only recently planted and most plantations are just starting to produce.

Production Systems

When farmers plant trees on their own, they plant from seeds they obtain locally or from neighboring countries (Guinea-Bissau or Côte d'Ivoire). Plantations are at excessively high plant density, which increases costs unnecessarily. Competition for nutrients and shading by neighboring trees will limit yields from these plantations. Many of the initial entrants into this crop are retired government workers, professional people and others from the local elite who own or can otherwise obtain access to land suitable for cashew production.

Other plantations are being established with technical assistance from SPCIA in grove layout, planting techniques, selected seeds, fertilization and pulverization, and maintenance programs. The establishment costs using the technological package recommended by SPCIA are FG 700,000 per hectare (\$350) and are broken down as follows: 77% direct costs (land preparation and planting costs: 37%; seeds, fertilizer, and equipment: 18%; and maintenance for three years: 22%) and 23% technical assistance. Only three kilos of seed are required per hectare, meaning that seed costs are a minute fraction of establishment costs and obtaining good plants from selected mother trees is critical to obtaining good yields. SPCA began by buying seeds from plantations in Guinea-Bissau but soon found that large, better and cheaper seeds were available from Foulaya research station. These seeds are being used for use in plantings in both Guinée Maritime and Haute Guinée. Wide spacing between trees is desirable. Foulaya was recommending 5x5 meter spacing (400 trees per hectare) and the removal of every other tree after a few years. SPCIA, on the other hand finds this practice illogical and highly wasteful of resources. It is recommending a 10x10 meter spacing (planting rate of 100 trees per hectare). This approach leaves considerable space between trees; during the development phase, this wide spacing allows small farmers to partially offset the establishment costs by intercropping the trees during the first few years with annual crops such as peanuts, rice, manioc, beans and maize. (However, not all terrain and soils being put into cashew plantations are suitable for intercropping.) Intercropping would also reduce maintenance costs for developing the plantation since costs of protection from stray animals, from bush fires, and weeding would be shared with the annual crop. Since farmers are organized in groups for their cashew production and assisted by SPCIA, its intermediation allows them to obtain annual production credit for their annual crops and in effect to finance the establishment of their cashews based on credit which is available for annual crop production; it should be noted that long-term credit which would be necessary to finance the establishment of cashews alone is not available in Guinea.

Trees start producing at a low level by year three and by the fourth year can produce around 200 kg per hectare which is sufficient to completely cover maintenance costs (estimated at FG 100,000 per year including the cost of harvesting). By the seventh year production should be at least 600 kg per hectare and tree canopy is well enough developed so that weeding under the tree is minimized and costs related to protecting the plantation from bush fires (keeping a 10 meter-wide perimeter clean of weeds) are reduced. Full production is achieved by the tenth year and is expected to stabilize around 1,000 kg per hectare. Trees continue in full production until they are 20 years old, after which production declines. Once in full production, annual production costs are minimal (not more than FG 100,000), being limited to fire protection and clearing weeds between the trees, and harvesting.

As trees become more mature, pruning may be required to reduce problems with fungi; SPCIA estimates that fungicide costs FG 15,000 per liter with additional costs for application. In Tanzania, farmers find it profitable to use fungicide on their plantations but in neighboring parts of northern Mozambique such applications are limited to areas where they are subsidized by projects. At some point, insects may become a problem and SPCIA is collaborating with Bordo research station for possible solutions. Trials with fertilizer would also be needed to establish the profitability of fertilizing cashew trees and whether the value of increased production is sufficient to offset the cost of fertilizer.

Cashew Agronomy and Requirements

Cashews are well adapted to all types of soil, though they prefer friable and deep soils. They can tolerate long periods of drought and high temperatures up to 40°C (but not beyond 45°C) and do not tolerate frosts. In many countries they are found right down to the coast and they grow exceptionally well a few kilometers in from the sea; however, they also grow in landlocked countries like Uganda in areas with climates similar to that of Haute Guinée. Its maximum elevation is about 1,000 meters above sea level. Best yields are obtained from plantations with rich and well-drained soils and with water available to the root system even in the dry season (in areas where rainfall is in the 1,000 to 2,000 mm/year range). Best production is obtained from areas with a well-defined dry season of three to four months' duration. Cashew trees are very tolerant of wind and have therefore been used extensively as windbreaks to control soil erosion.

Before establishing a cashew plantation, careful landclearing is required to assure that all roots and shoots are eliminated in order to reduce competition with young cashews for fertilizer and soil nutrients. Cutting back weeds and regrowth of vegetation around young plants is necessary for the same reason, as well as a protection from bushfires. Protection from stray animals is also necessary, since cattle especially like rubbing against young cashew plants because the sap acts as an insecticide. Neither cattle nor small ruminants eat the plants, but protection from breakage is necessary.

Cashews generally flower at the end of the rainy season on those parts of the tree which receive direct sunlight. Thus, cashew trees require a lot of light to achieve maximum yields. This requirement dictates the wide tree spacing recommended by research stations and technical assistance providers. If farmers are not going to replant trees every 20 years or so, but leave their trees well past their fully productive lives as has happened in Mozambique where some trees are 50 years old, then wider spacing is recommended. Where trees are planted too close together so that branches interlock or trees shade each other, flowering will only occur at the top of the tree and production per tree will decline substantially (up to 30%). In countries with two dry seasons, trees may flower twice during the year. The cashew harvest in Guinea is March to June, which means that it comes in about the same time as India's main harvest and therefore does not command premium prices sometimes available when Indian factories inventories of raw cashews are low prior to the Indian harvest.

Cashews are in the same family as mangos, and in some cases have been planted as a firebreak around mango plantations. Unlike mangos, raw cashew nuts grow outside and at the bottom of the false fruit. (If harvested at maturity, the false fruit can be used for making juice and wine early in the season before the nuts are fully matured. In commercial plantations, the focus of production is on the nut, not the fruit.) Cashews are harvested by picking fallen fruit and nut up from the ground, separating the nut by hand with a twisting motion, and discarding the false fruit as a soil nutrient. Remaining fruit is carefully removed from the raw cashew nut with a sharp knife; where this is not done properly, raw nut quality is reduced. When the harvest occurs in the dry season, harvesting has to be done every few days. When harvest coincides with the rainy season, daily harvest is necessary to prevent rapid deterioration of raw cashew quality. Fruit and nuts are not harvested from the trees but from the ground to which they fall when the nut is ripe. Therefore, thorough weeding and cleaning around the trees is required, especially if nuts are harvested in the rainy season.

Raw cashews have to be sun dried for two or three days until they have reached less than 10% humidity to prevent spoilage. If their humidity is maintained at below 10%, nuts can be stored for up to a year by farmers or by processing factories in order to maintain continuous production through most of the year. For example, SPCIA reported a recent order for raw cashews from India, with the buyer fully aware that the nuts are from the harvest which ended in June 2003. Thus nuts can be stored for many months provided they are kept at less than 10% humidity.

Cashew Marketing

In addition to its crop promotion activities, SPCIA also supplies inputs (seeds and also fungicide) and buys raw nuts. For the past five years, significant quantities of cashew have been produced and marketed from northern regions of the country. SPCIA was reported to be buying cashews during the 2000/2001 crop year at FG 400-500 (20 to 25 US cents at the current official rate for December 2003) per kg in the Kankan area (Cotton Filiere Study, August 2002) on behalf of *Société Multi-Produits Soduro*, an Ivorian processor in Odienné. SPCIA itself reported purchases in Guinée Maritime at between FG 500-650 (25-32 US cents) per kg in 2003. Other buyers were also in the market; one buyer in Boke was acting as an agent and purchasing raw cashews for export to India. FUTURLEC also bought 200 MT in Guinée Maritime; it should be noted that FUTURLEC's major shareholder (Mr. Scylla) is also the major shareholder in SOGEPAM, the company given exclusive rights to handle Guinea's agricultural exports. SOGEPAM's close connections with the top echelon of the GOG should give pause for thought.

The financial analysis of cashew production for sale as raw cashews (to exporters or local processors or those established in neighboring countries) indicates that at establishment and maintenance costs estimated by SPCIA and at low sales prices and conservatively estimated yields, cashew production is profitable from the point of view of the farmer. Assuming establishment costs of FG 700,000 per ha, production starting at 100 kg by the fourth year, rising gradually to 1,000 kg by the tenth, and continuing at that level until year 20 with a sales price of FG 500, cashew production has an internal rate of return of 22%. With the assumption that production continues to year 30 with no reduction in yield and other assumptions holding, the internal rate of return (IRR) is 23%. With a 20-year time horizon but with cashew prices 10% lower, the IRR falls to 20%. A 20% reduction in cashew prices causes the IRR to drop to 19%.

Table 16. Sensitivity Analysis of Cashew Production under Varying Assumptions

Assumptions	IRRs
20 years	22%
30 years	23%
10% reduced revs.	20%
20% reduced revs.	19%

Thus, cashew production is financially viable from the point of view of the producer and that this conclusion is robust in the face of assumptions of adverse conditions in the crop production or marketing. It also supports the conclusion that cashew production is profitable in its own right and that farmers can grow the crop profitably as they do in many other countries in Africa whether or not a domestic processing industry develops.

Economic analysis would have to take into account probable benefits from the impact of cashew plantations, most of which are currently on hillsides (like the one observed in Boke during fieldwork) which are expected to be positive, since cashews have already been used by the Department of Eaux et Forêts as a species for reforestation to protect areas water sources and hillsides. One impact is likely to be greater year-round availability of water in *bas fonds* located below such plantations. Information is not

available which would permit the calculation of economic rates of return, but these would presumably be higher than financial rates of return.

The new plantation observed in Boke and many of the others being established are owned by local elites. Addressing land tenure constraints would be a key element of a cashew promotion strategy that assures that benefits also reach small farmers. If cashew production is promoted without addressing this constraint, benefits attainable from cashew production by small farmers and their families are likely to be limited to working on estates of absentee owners and in whatever processing factories are established.

Domestic Processing

Cashews are currently being processed on a small scale in a rudimentary way on the local market and for export to Dakar. This processing industry could be expanded somewhat and cashews could compete with peanuts for snack food consumption in Guinea and Senegal and other neighboring countries during the times of the year when they are available. Income from these sales is in the hands of the women and children who do the gathering and processing, contributing to family survival and food security strategies. Local sales of roasted cashew nuts in small bags provide women with revenue of about FG 4,000 per kg. At the time of fieldwork (early November 2003) the women had all sold out and no product remained for roadside sales.

EnterpriseWorks has signed an agreement with USAID and is proposing the establishment of small-scale processing units for local groups and private enterprises. The technology employed is steam roasting and the use of manual technology coupled with small-cutting machines using Indian or Brazilian technology. EnterpriseWorks has plans to fabricate these machines locally to increase backward linkages with domestic production and further encourage employment. These technological changes represent a considerable improvement over burning the raw nuts in fires and smashing them with stones (which is the current technology). Women may benefit from this processing activity both through employment if processing factories are set up and possibly through membership in groups involved in small-scale processing.

Given the scale of these operations, most product sales will necessarily go to the national or regional markets. A market study would have to be carried out to determine that the national market plus the major regional market is able to absorb the production of small processing units to be established in Guinea plus those being established in Guinea-Bissau and Casamance by EnterpriseWorks (and perhaps other operators).

Industrial Processing of Cashews

Dried raw cashews need to be roasted before shelling. There are two processes for doing this: boiling (steaming) or roasting in oil. For steaming, nuts are placed in boiling water with a grill strainer inside for a time (30 minutes), then dried. For roasting, nuts are left in water to soften them then left to dry, before being put into an oil bath for two to three minutes at a temperature of 180°C). Then they are removed and left to cool.

Opening the nuts either requires using Indian cutting machines or tapping with wooden hammers. Once opened, the kernel is pulled out and then sent to an oven for drying prior to removal of its covering (*pellicule*) by hand. For small quantities, hammering is acceptable and experienced workers get good turnout rates (85% or more). While hammering is a good rustic method, it is too slow to handle large quantities. Virtually all new, small industrial operations anywhere in the world use Indian or Brazilian cutting technology. These machines are available in India for \$100 each. A prototype was manufactured in Guinea at a cost of FG 2,500 (\$125 at the official exchange rate, \$104 at the parallel rate), but no head-to-head test was conducted with imported machines to determine the relative efficiency, durability, and worker satisfaction of using the two machines. (Since EnterpriseWorks is proposing to make machines in

Guinea rather than importing them, such tests would be needed, including annual operating costs including down time for changing blades), to prove that domestic production of cutting machines is not saddling Guinean processors with an inferior equipment.

Cashew processing for the export market demands a minimum level of production of approximately 1,000 MT of raw cashews a year. This amount of raw cashews is needed to allow the export of a single small container. To obtain a small container of 20 MT of kernels, 80 MT raw cashews are needed each month; in 12 months a total of 960 MT (with an allowance for losses, roughly equivalent to 1,000 MT) are required to keep the factory running year round. This is the minimum needed for an enterprise to have a decent cash flow; the cost of the physical plant and equipment is relatively low (probably under \$200,000). However, working capital sufficient to buy within two or three months all the cashews necessary to keep the plant operating year-round is on the order of half a million dollars (\$500 per MT of raw cashews times 1,000 MT). Management of such a processing operation is also not easy, nor is sale of the raw cashews through international brokers. The best managers are those trained in Indian cashew-processing factories. Cashew processing is not the type of operation that newly formed farmers' associations can run effectively. However, as discussed below, cashew producers associations and private entrepreneurs can combine their efforts effectively to their mutual benefit.

Cashew processing operations using Indian technology are very labor-intensive and employ large numbers of women, particularly in cutting the nuts and removing the *pelicule*. Because of the cashew shell nut liquid on the nuts, which is highly caustic, some of the manual operations require attention to workers' hands. Either they must use rubber gloves, which reduces their efficiency, or they must be provided with oil of some kind (perhaps shea butter) in which to dip their hands at frequent intervals for protection. Cutting is usually done on a piece-rate basis, with a daily task being set at up to 12 kilos of kernels; payment has to be tied in some way to output of whole nuts to encourage careful work and a high turn-out of wholes.

The CNSL produced in roasting is a byproduct requiring some means of disposal. In small factories, it may be distributed to farmers to help dissolve termite mounds which must be removed from plantations, particularly those in the development stage. In larger factories, some revenue may be derived from its sale to manufacturers of brake linings.

Private Sector-Producer Association Partnerships for Cashew Processing

Producer organizations can in some cases participate with private entrepreneurs by producing cashews under contract with private processors and sharing part of the processing margin. For this kind of cooperation to occur requires a long-term commitment to developing farmer associations to the level of organization and competence that they are able to make and honor marketing agreements with the producer. An example of such cooperation is found in northern Mozambique. After six years of preparation, TechnoServe and CLUSA recently concluded a deal between a private processor (Miranda) near Nampula assisted by TechnoServe, farmers organizations developed with the assistance of CLUSA, and the biggest cashew kernel broker in the world (Ludwig, located in New Jersey). Here in Guinea, SPCIA and USAID have been in contact with Planters (the major nut company in the US). These contacts might eventually lead to a deal allowing it to set up processing facilities in Guinea and to work jointly with SPCIA and the cashew farmers it organizes to have an assured market for their production and hopefully to be able to sell their raw cashews on terms more favorable than those offered by dealers and processing industries in neighboring countries.

Institutions Supporting Cashew Development

The principal institutions involved in cashew processing include SPCIA, the Ministry of Agriculture, and the Peace Corps. One Peace Corps volunteer, Jordan Kimball, was reported to have been instrumental in organizing the planting of 27 ha of cashews in the Kankan region. No information has been obtained on

the Ministry's support for cashew production, although it is known that many private individuals are establishing cashew plantations and may be getting assistance from the Ministry of Agriculture in their establishment.

Constraints

The world price of cashews is well below historic highs. Vietnam's development of these crops on a massive scale has added 220,000 MT to world production. Communications with IITA by one of the consultants during 2002 indicate its reticence to promote cashew production on a large scale is related to its belief that prices will remain relatively low. However, at the most recent trader price reported US\$500 per metric ton of raw nuts (equivalent to FG 1,000 a kilo at sale). In view of earlier sale price reported at similar prices and farm gate prices related to these sales, such prices should be sufficient to allow traders to pay prices similar to those used in the financial analysis, which shows the crop to be profitable. However, this statement needs to be examined by a more thorough study of the market than is possible in the time available in this consultancy and the study's results need to be updated at frequent intervals in order not to encourage farmers to invest in the crop if market conditions no longer warrant such investments.

Large-scale plantations continue to be established in other countries in West Africa, such as a recently signed \$12.8 million AfDB project to increase the area in cashews in Ghana from 18,000 to 36,000 ha. Growth in cashew production and the world market for raw cashews and kernels needs to be studied in-depth and followed up on at frequent intervals. It would be worth USAID's while to commission a market outlook study and to subscribe to a major market outlook report.

For the time being, most production will continue to be bought by buyers from third countries who are interested in raw cashews. FUTURELEC has purchased and exported 200 MT of cashews to India. This fact is disturbing since its owner is involved as principal shareholder in SOGEPAM. This company has been granted an export monopoly on agricultural products and is currently enforcing it vigorously in the return of cocoa and coffee marketing forcing all exports to be channeled through the company and to be exported exclusively through the port of Conakry. This company's monopsony over foreign trade in agricultural products is disturbing normal trading patterns which include a high proportion of land-transport to countries in the region. It will probably have the effect of lowering farm gate prices to farmers for these two crops, and for any other crops, which are included in the monopsony purchase and export monopoly regime. If a similar approach were taken in raw cashew marketing, a large part of which are sold to buyers in Guinea-Bissau and Côte d'Ivoire and transported by land, the impact on farm gate prices would be strongly negative and could make the crop unprofitable from the point of view of farmers and discourage their current interest in this crop. The impact could be strongest in the Guinée Forestière region where the crop was developed with support from and for the purpose of supplying a nearby cashew-processing factory located across the border in Côte d'Ivoire. Similarly, any attempt to force farmers to sell their cashews at below world market prices in the name of promoting a domestic cashew industry could have the same effect of deterring farmers from investing in cashew production, as has happened in Mozambique where such a policy is in effect as of this writing.

As production increases with the technical support of SPCIA, the company's dual role of crop promotion and trading in the product it is promoting needs to be examined. At present, there are enough other buyers in the market, that producers have alternatives at the time their cashews are harvested. If SPCIA is going to provide inputs, it needs to be able to offset these loans through its marketing of products its producers provide. Alternatively, it needs a way to guarantee that these loans will be paid off if a producer decides to sell to another company.

Cashew plantations could also be useful in forest co-management as boundary plantations. Cashew trees are fire-resistant. Their production is significantly reduced by bushfires, but they will not burn. Therefore, farmers with cashew orchards will have an incentive to prevent uncontrolled burning. Furthermore, farmers will police intrusion into the forest during the time the trees are in fruit or producing mature nuts to protect their crop from theft. Their contribution to achievement of other NRM objectives also needs to be looked at.

The most prominent cashew agronomist known to the consultants, Dr. Clive Topper, has been in contact with the technical operator (SPCIA) and with IRAG. Additional work is needed to assure that good plants are being provided to farmers to optimize yields and to make the best possible use of the land, labor and capital that they are investing in this crop. Continued research will also be needed in crop agronomy, focusing on fungi and insect attacks and means of combating them, including pruning in the case of fungi and IPM for insects.

Opportunities and Potential Interventions

The world cashew market should be investigated to assess its long-term prospects and to determine if Guinea's costs of production are such that it can compete with established producers. If this is the case, production should be promoted in a way that allows small producers access to land on which to produce this crop. Land tenure constraints need to be clarified and addressed appropriately.

Initial attention needs to go to assuring that farmers obtain a high percentage of revenue from raw cashew exports. On a policy level, donors would be important to use their good offices to assure that the GOG does not institute an export levy or a ban on exports (as was done in cocoa and coffee in 2003) to favor SPCIA interests. Bad policies of this type has had a devastating impact on the reestablishment of cashews in post-war Mozambique and on farmer willingness to invest in the kinds of production technologies including spraying against fungus, which is the main problem the crop usually faces.

NRM projects like Winrock and PVOs working in areas suitable for cashews should be encouraged to include cashews in the activities they support as a cash crop, boundary plantation or live fencing. Intercropping with annual crops during the initial years while the cashew orchard is being established is feasible given the wide tree spacing recommended; income from these annual crops can help pay the cost of establishing the cashew orchards.

Processing should be supported at two levels:

- commercial export processing and
- artisanal processing by women.

Commercial processing should focus on labor-intensive technologies (manual Indian cutting machines) in small factories handling 1,000 MT of raw nuts; commercial processing of this type will have a major poverty reduction impact by generating substantial employment, a high percentage of which is normally for women. Commercial processing will probably take the form of private sector investments possibly in collaboration with contractual arrangements with producer organizations. Artisanal processing should involve improvements on existing technologies (simple roasting instead of burning raw nuts, opening with hammers instead smashing nuts with stones) and should focus on sales for the local market; income from this type of processing also favors poverty reduction and food security through increased income, since processing and sales are in the hands of women. Use of the cashew apple (false fruit) for making juice or wine will be discouraged if farmers and women processors have a good market for raw nuts or roasted cashews.

7.8 Vegetable Crops

Subsector Overview

Commercial vegetable production has become a major source of income for small farmers, particularly women, in all parts of the country. Much of the production is carried out in *bas fonds* during the dry season. Its focus is on commercial production rather than direct family consumption. Product sales do, however, provide for family food security through increased income with revenues thus raised being used to purchase staple food products during times of scarcity when family food reserves are low. The focus of the production is on the market and thus is subject to the demands of the various markets in terms of the types and varieties of vegetable produced, quantities required and prices paid. The destination of the product varies depending on production location; demand and prices in the various markets; and links (including family ties) between producers, traders, and buyers in the different markets.

The main vegetables grown include onions, potatoes, tomatoes, eggplant (local and European), fresh maize, large peppers, and hot peppers. All these crops are grown for the local market, for markets in nearby cities and towns, for major urban centers, and for exports. Traders come to weekly markets in production areas; in some cases they also go straight to field of major producers or of producers organized in groups. Some producers, particularly in areas well connected with the Conakry market, such as those from Labé, Coyah, Kindia, and Forecariah, take the product directly to market themselves. Market chains vary from product to product. For many products, many different channels are active at the same time. In addition to domestic sales, many of the products from the Fouta Djallon are sent north to Senegal, Guinea-Bissau, and the Gambia; however, the main export market is Dakar itself.

Constraints

These crops are grown in different areas of the country and at different elevations and under varying production systems. However, there are commonalities in the problems that farmers face in growing and marketing these crops. These include land tenure and access constraints, fencing, seed, input supply, technical assistance, water control, and marketing and finance.

Seed

Seed is a major constraint for farmers wanting to grow certain vegetable crops. Often they simply cannot get the seed that they want and are forced to grow the varieties that they can get or to plant land prepared for one crop to some other less desired crop due to the lack of seed. Some of the seed is obtained from that saved from previous crops or from local farmers or merchants at weekly fairs; such seed may present germination or other problems leading to additional costs or lost opportunities as crops are lost or fail to produce at feasible levels.

Some farmers obtain seeds for onions and potatoes from the Federation of Timbi Madina. In the case of potatoes, a small amount of foundation potato seed is imported from Holland at great expense and then multiplied by selected members who supply second generation potato seed to members of the federation at more affordable prices. Some farmers are forced to buy seed that is third or fourth generation, whose price is lower but whose yield is also lower. It was not clear from fieldwork if this presented a real problem given the trade-off between cost and yield. The multiplication rate for potatoes is about 20 to one; therefore most farmers will always be planting third or fourth generation potatoes. Potato seed has to be brought in from outside the zone it is planted in to avoid problems with fungus. (Maine potato seed, for example, is produced in south Florida during the off season.)

Onion seed is also imported from Holland by the Federation of Timbi Madina, and ACA has distributed to some onion seed to farmer groups. ACA imports onion seed from Senegal (GSN Onion Violet de Galmi) and France (Tezier Texas Early Grano 502). Other farmers buy from Senegal or locally to obtain

varieties preferred in the local market. Often farmers are forced to grow whatever seed they can get and sometimes end up with poor quality seed that they buy in the local market with no guarantee of quality. Vegetable farmers in the Siguiri area with assistance from an ADRA food security project produced large quantities of white onions (which are favored by Europeans but do not store well) because that was the seed provided by ADRA's PADRAS project, instead of producing small shallots which is what is demanded by the local market and which can be stored for long periods until sold. While there is a market for white onions in urban markets serving Europeans and others acculturated by contact with Europe, most Guineans and Malians prefer the small local variety of shallots for reasons of taste and its better storage properties. Failure to investigate consumer preferences and marketability resulted in a glut affecting farmer incomes and the repayment of loans used to finance production. The seed a farmer chooses to plant depends on the market he is targeting with the crop. Timeliness of seed supply can also be a problem because of production constraints and marketing windows when the best prices are available.

The high cost of seeds is also a constraint. For example, at FG 1.6 million/kilo for cabbage or okra seed, seed is a significant part of the cash outlay for these crops (400 gms are used per hectare at a cost of FG 640,000). The fact that there is no guarantee of germination or quality is a problem in some cases. ACA has tried to act as an importer/distributor for some types of seed but has not always succeeded in meeting farmer demand or in supplying the seed in a timely fashion in this fast expanding area. Therefore, many purchases have had to be made in the local market buying varieties which happen to be available and of a quality which is not known *a priori*.

Farmers in N'zerekore received assistance from ACA in crop technologies for hot peppers. When seeds that farmers were promised did not materialize, they were forced to use seeds from selected hot peppers bought locally, which were adequate in this particular case. Production was apparently successful and farmers were able to sell their hot peppers in the weekly markets when ACA failed to buy all the production as agreed. The peppers sold for a price of FG 3,100 per kg (higher than the price of FG 2,500 paid by the consultant for a sample purchase in a weekly market near Labé in November 2003).

Fertilizer

Vegetable farmers in Guinea have in effect been growing vegetables organically by default due to the extreme difficulty of obtaining fertilizer and other farm chemicals needed for their production. US PVOs advising vegetable farmers have been further constrained by their prohibition from advising farmers on the use of fertilizer or pesticides by USAID policy. Fertilizer is brought in through two major channels:

- Fertilizer donations, principally Kennedy Round II grants from Japan; and
- Commercial imports either by sea from Europe and other sources or by land from Senegal, which has a domestic fertilizer bagging industry called Senchim (or from Guinea-Bissau).

Purchases from Senegal and Guinea-Bissau are often made to take advantage of favorable trucking rates for back-haul, as trucks often come back empty from these markets.

Fertilizer grants are to the GOG which channels supplies through the Chamber of Agriculture, which sells it to selected members at a subsidized price; the lack of transparency of this distribution is well-known. The sudden appearance of fertilizer in the market at subsidized prices, albeit in small quantities, disrupts legitimate trade in fertilizer. Commercial imports are brought in by a few large traders who distribute to retailers selling at shops in town as well as at weekly markets. Because of the uncertainty engendered by subsidized imports from donors, importers are hesitant to bring in major quantities needed for fear of being left with unsold stocks should donations prove larger than expected or should they be channeled to a specific region for some reason glutting the local market. Nevertheless, fertilizer (urea and various formulations, the most common of which is 17-17-17) was observed during fieldwork to be generally

available in limited quantities throughout rural areas of the country. Fertilizer sells for FG 40,000-50,000 (\$20-25) per 50 kg sack (equivalent to FG 800-1,000 per kg). It is also rebagged specifically for the needs of vegetable farmers and retailed in bags as small as one kilogram; the price quoted is usually the same per kilo bag as for a full sack (i.e., no quantity discount). One problem that vegetable farmers face is spot shortages or complete unavailability of fertilizer at critical times when they need to apply it. It should be noted that fertilizer is not used to substitute for but in addition to manure, whose supply is limited by the number of animals farmers own, how they corral them at night, alternative uses (*tapades* have first claim on manure), and limited sales of manure by livestock producers not engaged in farming. Farmers put a high priority on fertilizer and in order to have it available when needed sometimes purchase fertilizer immediately on making major crop sales so as not to be left without for the next production cycle. Potatoes are one of the major crops requiring fertilizer (one MT of 17-17-17 and 200 kg of superphosphate per hectare on top of 20-40 MT of manure or compost to achieve respectable yields (20-25 MT per hectare).

Pesticides

During fieldwork, farmers nearly universally reported pest problems with their vegetable nurseries and crops. Left to their own devices, farmers sometimes purchased pesticides to deal with these problems, in some cases seeking assistance from the Plant Protection Service of the Ministry of Agriculture. However, those working with the support of US PVOs were not receiving appropriate technical assistance on identification of pests and therefore were not advised on appropriate countermeasures. For example, vegetable farmers near Mamou being assisted by OICI faced major problems last year with nematodes eating the roots of tomatoes, onions, and peppers (their major crops). Losses in production were 5% overall, but many nurseries were entirely destroyed, with roots cut and plants dried up entirely and dying. Organic products (e.g., hot peppers, leaves of the nime tree, and kitchen ashes) have no impact on the nematodes and only limited effect on the other types of disease and insect infestations. These problems are very frequent and there is nothing that US PVOs have been able to recommend to farmers to do about them in the past in view of the prohibition to use of pesticides (USAID Regulation 216).

Nevertheless, farmers are beginning to purchase pesticides (insecticides and fungicides at a cost of approximately FG 20,000 or US\$10 per liter and 15 liter hand-pump backpack sprayers at a cost of FG 200,000 or US\$100). Some owners of sprayers are already providing custom service at a cost of FG 25,000-30,000 if they provide the chemical and FG 10,000-15,000 if the farmer provides the chemical and they provide only the service of applying it. In cotton-growing areas (Haute Guinée and parts of Moyenne Guinée), farmers are well acquainted with pesticides which are heavily used to produce a cotton crop of acceptable yield and good quality). Their experience with pesticides in cotton carries over into their work in producing vegetables which farmers are substituting into as a result of the demise of cotton as a commercial crop.

Water Control

Vegetables are grown year-round under a number of systems. However, water control is an issue in most systems, especially in off-season production in *bas fonds* as well as irrigated plains system, where irrigation accounts for 17% of total costs. Off-season producers often lose crops or achieve low yields due to lack of water toward the end of the growing season. Treadle pumps, though manufactured in Labé (the factory was visited during fieldwork), are not widely used. Thus inadequate water control is a factor in limiting vegetable production and incomes.

Fencing

Because of the prevalence of stray animals and rambunctious herds and the increasing use for agriculture of lowlands which may have served as dry season pasture for animals in the past), vegetable growing areas need strong fencing to protect the crops from being decimated by livestock (especially cattle and goats). Wood fences are costly in terms of the labor needed to cut the wood and build them and have to be

rebuilt almost from scratch annually. Wire mesh fencing imported from France comes in rolls of 25 meters and costs FG 90,000 (US\$45); so fencing a hectare would cost FG 1.4 million (\$720), not counting posts and labor. Nevertheless, some wire mesh fencing was already observed during fieldwork near Labé. Improvement in fencing would increase income and reduce risk. Income from high-value vegetable crops like potatoes is high enough to justify the investment (and could even be recovered from a single crop though it really needs to be amortized of several crops).

Financing

Some of the microfinance institutions and banks are already starting to finance some vegetable production, with some difficulty if production is not clearly market-oriented from the start. For example, ADRA's food security project in Siguiri financed production of vegetables glutting the small local market with too much production all coming at the same time and the production of some varieties not adapted to local food preferences, leaving farmers unable to repay some loans despite bumper crops of vegetables. Nevertheless, the activity in general is profitable and is beginning to gather some support from microfinance institutions and banks, provided adequate security or guarantees can be provided. Credit intermediation by PVOs like CLUSA has been crucial in some cases in getting the financial institutions to overcome their reticence to finance agriculture and small scale agricultural trading.

Marketing

Market information on the prices of main crops within Guinea is provided on a weekly basis by ACA. There is a proposal to add market volume estimates as well, although these are less important to farmers and traders than price information. The information is limited to markets in Guinea. Given the amount of exports to neighboring countries to the north (Senegal, Guinea-Bissau, the Gambia, and Mali) and to the south Sierra Leone and Liberia now that the war has apparently ended, information on these markets is also needed. Bribe-seeking at checkpoints also adds to costs and gets products to markets late and with losses of freshness; lack of foreknowledge of the severity of this interference also hampers trade. State-of-the-route reports could be helpful, given the appalling condition of many rural roads and even of major trunk roads, which often become impassable at times during the rainy season, critical to vegetable farmers with perishable products for sale.

The condition of roads hampers access to many areas where traders might otherwise come directly to farmers' fields to pick up vegetables and take them to market or to allow farmer groups to hire transport and market the products directly; it increases the costs for transporter who do choose to come risking their vehicles in so doing. It also reduces competition in the weekly markets by reducing the number of small traders and collectors willing to risk their trucks. The lack of small rental warehouses at weekly fairs makes it hard for traders to stock products for deferred transport in case of rain or other problems and for farmers unable to sell their products to hold them for sale at the next market day. Likewise, some farmer groups would like to have farmer-owned warehouses in their major markets to help members market their products directly. Most vegetable marketing is and will remain in the hands of traders, often women; financing through microfinance institutions to encourage and expand their trading businesses will benefit producers through increased competition.

For some products, such as potatoes, cold storage for holding potatoes for 2-3 months to obtain best prices in the Senegalese market could be a viable option. The Federations of Timbi Madina and the Federation of Farmers of the Fouta Djallon may be strong enough to manage this type of activity on behalf of their members. For other vegetables, such as onions, lack of improved storage not based on refrigeration is also an impediment.

Opportunities and Potential Interventions

There is considerable potential for expanding vegetable production and extending the times of the year that it can be carried out in each area in order to target price peaks in the markets for which farmers are producing. This support coming from a donor like USAID needs to be channeled through democratically governed producer organizations of the type being developed by CLUSA and other US PVOs. Farmers need assistance in making enforceable land tenure contracts of a duration allowing the recovery of all investments which provide them secure access to land developed for vegetable farming. Once agreement is reached on tenure issues, support is then needed on fencing and improvement of water control, including small farmer irrigations systems, tube-wells and treadle pumps, as well as drainage and dike systems at a level farmer organizations are able to maintain without continuing injections of outside support.

Support for the development of better marketing of vegetable seeds from reliable sources would be beneficial to the farmers involved in this type of production.

Farmer access to fertilizer needs to be improved through expansion of private sector distribution of fertilizer as has been done in neighboring countries with the intervention of IFDC. Crop protection issues need to be addressed by allowing participating PVOs to channel farmers with pest problems to competent authorities to advise on solutions and to then be directed to sources of crop protection chemicals and finance to purchase them. USAID needs to seek a clarification on Reg 216: the mainstream of vegetable marketing is not organic (which is the approach taken by USAID and Peace Corps in the past). Its new approach needs to be based on appropriate NRM techniques which are being transmitted including use of manure and compost (to the extent that it is cost-effective) coupled with the use of appropriate farm chemicals to enhance productivity and protect high-value vegetable crops which represent expensive investments for resource-poor farmers.

Microfinance institutions need to be assisted to provide financing both for vegetable production and marketing to a greater extent than they already are. CLUSA's efforts in credit intermediation have a thrust in this direction which needs to be encouraged and expanded to include other PVOs, banks and microfinance institutions.

Farmers need more information on markets, including better communication of existing information and access to information on markets in neighboring countries; such information could be obtained by collaboration with similar USAID-funded market information projects in these countries or projects funded by other donors. Reports on bribery at checkpoints along major routes would be helpful where farmers have alternative routes available. Radio broadcast of this information might shame some of the GOG officers involved in demanding bribes to change their behavior, as it has in some countries.

Disruptions to the market such as the proposal to channel all agricultural exports, including potatoes, through the SOGEPAM semi-private marketing board recently decreed by the GOG, could have a profoundly negative impact on the development of export-oriented vegetable production and on reducing farmer marketing options and farm income.

Specific support is also needed to improve weekly markets in terms of their planning, lay out, infrastructure, and storage capacity. Market user involvement will be a key element to making such support effective. Support for appropriate storage systems for potatoes and onions would also be useful.

7.9 Forestry (timber) and Non-timber Forest Products

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.10 Rubber

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.11 Fisheries

7.11.1 Fisheries Industry in Guinea

Overview

Guinea's fishing resources exceed 200,000 tons in those years when small pelagics are in abundance, a higher level than most countries on the Gulf of Guinea. However, the country lags behind Guinea-Bissau and is far behind Senegal in terms of total catch.

Sea fish resources are complemented by continental fish resources, the fishing of which is less concentrated but significant. There is a large river network and there are extensive mangrove areas.

It has been estimated that the total catch from sea fisheries (in 2001) was 137,262 tons, of which artisanal fisheries accounted for 71,579 tons (52%) and industrial fisheries for 65,683 tons (48%).

Small pelagic species, chiefly bonga shads, accounted for 54,607 tons (76%) of the artisanal catch, while demersal species made up 33,267 tons (51%) of the industrial catch.

In that year, in terms of fishing effort, out of a total of 3,500 artisanal vessels 1,600 (46%) caught demersal species and 1,900 (54%) caught small pelagic species. A total of 183 industrial vessels were active, of which 83 (45%) caught demersal species, 53 (29%) caught cephalopods and 43 (23%) caught shrimp.

Of the industrial vessels only 24 (13%) were reported as domestic vessels, while 93 (51%) were foreign vessels based in Guinea, 24 (13%) were foreign vessels, 20 (11%) were foreign vessels from the EU and 22 (12%) were foreign vessels fishing under an agreement with China.

Constraints

Industrial Fishing is Dominated by Foreign Interests

Ownership. Guinea's share of the ownership of the industrial fishing fleet working in its waters is very limited (24 vessels out of a total of 183).

Licensing. Licenses for a large part of its fishing operations have been given to foreign fleets. Allowing resources to be caught by foreign vessels can be justified when domestic vessels suffer from technical and economic deficiencies, which constrain their access to the resources. This is the case in respect of deep-sea tuna fishing, deep-sea trawling and fishing for small pelagic species on distant fishing grounds, which require powerful vessels, which the local fleet cannot afford. On the other hand, granting licenses to foreign-owned trawlers to fish in shallow waters puts these fleets in direct competition with Guinean ship owners.

Supplies and landings. Foreign-owned vessels get few of their supplies and land little of their catch in Guinea, so that there is little spillover into the national economy.

Harbors. Little attention is given to fishing activities in the current harbor, as it is not much used by the industrial fleet. Its limited docking capacity also acts as a constraint on the size of the Guinea-owned fleet.

Ineffective Fisheries Protection

The available physical resources are inadequate when compared to the importance of the fisheries to be protected and the size of the EEZ. Patrol vessels rarely sail and the number of infractions reported are few in number despite well-documented violations by commercial fishermen (including trawlers fishing in inshore waters set aside for artisanal fishermen, cutting nets, etc). As a result, the protection is insufficient and provides only limited revenues to the national budget (FG 35 million, equivalent to US\$17,000, for income from fines in 2002).

The following functions are all executed under one public agency:

- processing files and documentation related to fishing license requests and calculating the corresponding fees to be paid,
- granting the licenses,
- collecting the license fees, and
- controlling and monitoring fisheries.

These multiple and conflicting responsibilities weaken the system as a whole, at the expense of the state and of the sector.

Lack of Effectiveness in the Management of Fishing Resources

Sustainable improvement in fishing resource management would require overcoming several problems:

- interaction between fisheries (shrimp trawlers destroying juveniles of quality varieties of fish, cephalopod trawlers also catching fish and crustaceans);
- some migrating fish populations can only be managed at sub-regional level;
- the magnitude of foreign fishing suggests a lesser accountability among operators; and
- weak control systems encourage illegal fishing, which would offset benefits gained from sound management measures adopted.

Fiscal Revenues Derived from Fishing are too Low

The sector contribution to public revenue, as recorded in the treasury in 2002 (revenues related to fishing agreements and fishing licenses, remuneration of CNSP services, taxes collected by ANAM, direct business taxes, fines) amounted to FG 14.5 billion, equivalent to US\$7 million. However, it has been estimated that the amount to be collected, given the level of activity of the fleet, should have been FG 21 billion, equivalent to about US\$10 million.

The difference between the amounts collected and theoretical revenues is the result of fraud related to the payment of fees by vessels.

The sector output, estimated on the basis of the catches and the commercial values at the point of first sale, totals FG 451 billion, equivalent to US\$220 million. The total cumulated imposition by the GOG is thus only 3.2% of the sector total output, an extremely weak ratio.

Saltwater aquaculture has not been contributing to export earnings and past attempts had failed. However, Canadian company (SNC Lavallin) has established a \$14 million shrimp farm on Tamara Island where a

shrimp farm and processing facility existed in the past. (This facility was not visited during fieldwork for the assessment.)

The weakness of foreign earnings from exports of fisheries and aquaculture products has been pointed out before.

Major Constraints to the Development of Artisanal Fishing

One supplier only provides outboard motors and the motorization rate of the artisanal fleet does not exceed 30%. Furthermore, its fuel is not tax exempted. Motors are available with the most common brand being Yamaha 15 horsepower, which costs FG four million, and 40 horsepower (FG eight million); some Johnson motors are also used but are hard to find spare parts for. A few nets are bought by the government and projects at subsidized prices. Most nets and other fishing gear are bought from traders in Conakry with foreign exchange purchased on the parallel currency market (at a rate in December 2003 that was 20% higher than the official rate, FG 2,400 versus FG 2,000 per dollar). For the most part, nets come from Korea, China, and Japan.

Services to the artisanal fleet (spare parts of fishing equipment, ice-making plants, repair shops, landing areas) are insufficient, especially outside the capital city. Furthermore, the ice-making facility which had been managed by and was the major sources of revenue for the local fishing cooperative was taken over by the Ministry along with collection of revenues when new ice-making equipment financed by the Japanese was installed at Kamsar as part of Japanese International Cooperation Agency support to artisanal fisheries. UNDP and FAO also contributed to upgrading the artisanal fish landing in Kamsar harbor.

An Insufficiently Developed Export Potential

The export of frozen products, which have not been landed in Guinea, shows the lack of integration of the sector in the national economy and provides a measure of its export potential. The export of fresh fish to Europe represents a major break-through, which could be further extended, in particular by integrating quality varieties, such as striped mullet.

With respect to fresh or frozen products, Guinea's operators are not, for the time being, authorized by European health authorities to export fully processed products, with the exception of value-added products, such as fish fillets.

Opportunities and Potential Interventions

Artisanal Fisheries

The artisanal fleet has severe problems, as follows:

- A crucial problem in outboard and spare parts supplies is that the only authorized supplier does not meet the requirements of the artisanal fleet. According to local sources, only 30-40% of the artisanal fleet is motorized.
- Insufficient supply of affordable fishing equipment (nets, lines, ropes, hooks, floats, sinkers), currently often sold at prohibitive prices.
- A poor return due to the lack of preferential pricing for oil, which artisanal fishermen must buy presently at regular prices.
- Inadequate fishing support services, in particular in respect of landing areas away from the capital city, such as ice-making, input suppliers for artisanal fishing, maintenance and repair workshops, and development of landing areas.

Freshwater Continental Fishing and Aquaculture

The statistics from the Ministry mention only 850 small-dimension canoes (one or two people) with no engines officially catching only 1,500 tons. There is a total lack of information regarding the contribution of this fishery: some sources mention catches of about 100,000 tons.

This lack of precise information makes it very difficult to actually assess the national fish consumption.² It also makes it hard to assess the absorptive capacity of the domestic market, particularly for rural areas.

With respect to freshwater fisheries, the river network and rainfall in Guinea make freshwater tilapia aquaculture possible, as it is usually the case in Sub-Saharan Africa. Prospects for growing tilapia in Guinea, owing to many favorable factors, are good: demand in rural areas, extensive aquaculture requiring few inputs and little transfer of know-how, financing from own resources by operators with income derived from agriculture and other fields of endeavor.

It is the view that the continental aquaculture sub-sector should be developed not towards exports, but in the context of food security in rural areas, where the protein balance is insufficient, and of income-generation contributing to poverty reduction.

Limiting Factors

Some of the main limiting factors affecting artisanal fisheries are the unavailability of fishery inputs and marketing constraints in respect of the European Union, especially in terms of quality.

For both ice-packed fresh fish and for frozen fish, Guinean operators are only authorized by European health authorities to export whole, head-off, gutted and scaled fish. Products with a higher added value have not all been granted access yet.

Favorable Factors

The large number of foreign vessels fishing Guinean waters and the volume of “exported” catches, formally or informally are evidence of the industrial fisheries high export potential.

The hardbottom and semi hardbottom areas are significantly smaller than those covered by soft-bottoms, where industrial trawling is too intense. However, they are significant enough for exploitation by a dynamic artisanal snapper fleet catching hardbottom, high market value species of fish (Sparidae and Serranidae). Exports of these species to Europe constitute an important international trade asset.³

The artisanal sector’s vitality is also an asset: for example, the recent emergence of an integrated artisanal⁴ sub-sector (fishing, packaging, and export) on the “*boboé*” with a market share that is growing at the expense of Korean industrial fisheries.

Furthermore, there are reserves of unexploited species that could be developed for export. Particularly relevant examples are the stock of Striped Mullet on the hard and semi hard-bottoms, for which demand is high in the European market, as well as a stock of a gastropod mollusk (the Conch, *Cymbium* spp), a prized species in the sub-region, particularly in Senegal, as well as in Asia.

² Sea fisheries lending and fish imports constitute the sole basis for determining a national consumption estimated at 13.5 kg per capita per year and do not take into account freshwater fisheries and aquaculture.

³ Their exports has created an awareness of the Guinean fish, developed solid relationships and brand loyalty on several European markets (e.g., Rungis and Billingsgate) and set an enabling environment for further exports of different species or products.

⁴ Today, it is about 120 tons per month of frozen freight.

In terms of airfreight needed for fresh ice-packed fish products, Air France has five flights a week and SN Brussels (ex-Sabena) has two flights a week, the details of which are not available. Based on information provided by Air France, average daily cargo capacity is approximately 2.8 MT per flight (75% on pallets and 25% in containers), which translates into almost 20 MT per week or over 1,000 MT per year. Fresh fish pays a premium and has first priority for available cargo space (over mangoes, for example). Both Air France and SN Brussels have indicated their readiness to meet additional demands for capacity. Some additional air cargo space may become available from FSU companies; FUTURLEC also claims it will be providing cargo service to Europe. However, there at present are no scheduled cargo flights.

Immediate Action for Artisanal Fisheries

It is clear that there is a crucial problem with the marketing of input supplies to artisanal fisheries. This is probably the result of different factors, including: lack of knowledge of the global and regional needs of artisanal fisheries, lack of interest on the part of suppliers, past outstanding debt problems of artisanal fisheries and lack of competition between suppliers.

It is necessary to develop a study that will not only determine the needs of artisanal fisheries, but also identify factors that can explain the situation and provide remedies to it, which may include modification to Customs import tax structures, an appropriate loan system, etc.

Short-term Actions for Artisanal Fisheries

Ice boxes. It is reported that artisanal fishermen prefer iceboxes on board that are made of polystyrene and wood; however, these iceboxes are often in bad shape, without food-safe paint or an ice runoff evacuation system. It was noted that, because of inadequate fish quality, at best, only two thirds of catches can be exported.

The establishment of a pilot project to introduce improved iceboxes could offer a simple answer to this problem, and this could be achieved by designing, and building locally, improved iceboxes:

- Isothermal iceboxes (using PVC for example) with a coating that is food safe and is easily washable.
- Sliding screens (separators) to avoid crushing products.
- An ice runoff evacuation system.
- Water-tightness of containers to ensure appropriate conservation and handling of products during airshipment.

Ice-making and other services. Additional ice-making and other on-shore support facilities are needed. These should be supplied either by artisanal fishermen's cooperatives or other private sector operators.

Fisheries for mullet. Arrangements are necessary to assist in the development of a fishery for mullet, which is a relatively sedentary fish, by distributing mullet resources among professional families using box systems, provided that industrial fisheries will comply with box zoning. This would require a major increase in patrol and enforcement activities.

Sanitation for the artisanal fisheries export sector. Structures and the urban environment, particularly in terms of cleanliness, in which fresh product export preparation workshops operate are inadequate. A major constraint to the activities of the private sector, industrial and artisanal, is that of water service. There is no control of the quality of the water available from the public supply. Technical assistance is required to identify and compare the possible development alternatives to meet sanitation requirements.

Long-term Actions for Artisanal Fisheries

Conch. Guinea should develop the production of conch as a product with export potential. Appropriate management arrangements, such as fishing by zones, will be required bearing in mind that, after it reaches a certain size, conch tends to be sedentary.

7.11.2 Aquaculture

Subsector Overview

Freshwater aquaculture is just starting in Guinea; its initial development is concentrated in Guinée Forestière. There are three systems, each of which is related to a specific promotion agency: the SOGIPAH project, FAO's quick response Technical Cooperation Program, and the PPGF project supported by the French NGO APDRA-F. Each promoter has a different approach, only one of which is commercially viable and therefore very attractive to farmers as an investment opportunity in its own right.

SOGIPAH: As part of its overall project strategy to free up land for industrial plantations of oilpalm and rubber, SOGIPAH has made investment in improving *bas fonds* for rice production by villagers participating in the project. Food production under a semi-intensive production system in these areas is designed to offset losses of production from land taken over by the estate. Rice production in the *bas fonds* is in some cases accompanied by joint production of fish; local species are allowed to grow in the rice and harvested by the community. The focus is on biomass production of whatever species are found in the water courses feeding the rice. There are also 64 ponds that hold water for irrigation which are also stocked with tilapia and other species. No sexing is practiced, nor are local species (*Tilapia zilli*) eliminated in favor of larger-growing tilapia, catfish and other more productive varieties. System design does not permit totally emptying the pond areas to allow the elimination of other species. Production is sporadic and not in all rice fields; interest on the part of villagers is relatively low as production is low and incentives are not strong to increase it based on low yields obtained under this system. The fish produced are basically used for local consumption and the focus of the operation is not really on commercial fish production. There are 52 ha under this system (only a small part of the area dedicated to rice production; yield is estimated at a maximum of 500 kg per hectare per year of fish with a mixture of species present. Nevertheless, sales in the local community are brisk, with prices in the FG2500 per kg range, with prices for larger catfish going up to FG3500 per kg. Consumer preference for larger fish is not well established, so any size fish can be sold, providing an incentive to sell small fish before they have fully matured.

FAO-Technical Cooperation Program/GUI/0066

FAO's Technical Cooperation Program is funded by FAO itself and provides a mechanism for quick response to demands of member countries. Projects are limited to 18 months (which can occasionally be stretched to 24 months) and costs are limited to about \$250,000 which is sufficient to fund pilot projects such as its aquaculture project in N'zerekore. The project was visited as part of fieldwork. Three project assistants have trained, 34 fish farmers and a total of 50 ponds (41 of them operational) have been made. Ponds are located near villages with a number of fish farmers from each village participating and with the encouragement of local authorities. Peer-to-peer information flows are an important part of the development of a knowledge base. Because of the way they have been designed, most ponds cannot be completely drained which means that it is impossible to eliminate local species (and females) from the ponds. Construction costs are kept to a minimum by using local materials where possible rather than purchasing them. Sexing is not practiced, and reproduction occurs in the pond, limiting growth and the size of fish. Most fish are sold at 100-300 grams, which is acceptable to the village market. Expected production levels of 1,500 kg per ha have been substantially exceeded by participating farmers whose ponds are in full production. All fish are sold in the village either in the village itself which is usually within easy walking-distance (five to 15 minutes) or at pondside; based on farmer's experience, there is a tendency to move the selling point away from the side of the pond to minimize theft. Farmers attending

the workshop expressed satisfaction with what they had achieved in the short time available to the project but sought continued support and improvements in the technology.

Projet Piscicole de Guinée Forestière of APDRA-F

The PPGF is financed by *Agence Française des Volontaires pour le Développement* and is managed by a French NGO (APDRA-F) which specializes in aquaculture development. The project was first established Guéckedou in 2000 war. The area soon found itself enmeshed in war, making it necessary to move the project to the N'zerekore area where physical conditions are slightly different. The move slowed down the project and required some modification of proposed technology and the development of contacts with new villages and groups of prospective participants. As a result, the project really began in early 2001. The project has a Chief Technical Adviser, two volunteers, a national associated director, and a secretary, but will eventually have 10 field assistants. Selection of each project intervention area is careful and thorough, requiring an appropriate *bas fonds*, support of the neighboring community and local authorities development, individual farmers prepared to invest their own resources and time in its development over a period of years, and a group of nearby communities with appropriate conditions and interest to develop a nucleus of fish farming groups within close proximity to one another. Once a community is selected, a very complete study and development plan for three years for each site is done, including topographers surveying the site with theodolites, etc and plotting out their topography on a map showing how production and service ponds will develop overtime and how and in what crops adjacent areas will be used. Farmers invest their own resources in developing their sites, supplemented sometimes by contributions of family members and the local financial system (*tontines*). Investments are substantial and construction is designed to be permanent. Pond drainage and the construction of service ponds to produce fingerlings and to hold unsold fish at harvest are essential elements of this commercially oriented production system.

Support provided by the project to groups of fish farmers is based on a contract between the group of fish farmers, the village and the project. This is a pre-condition of project support. Local authorities are involved in order to control theft and settle land tenure issues in order to permit to allow permanent development of the fish farms. The contract also makes fish farmers who have learned the system responsible for training newcomers. At first, a high level of organization is not demanded of fish farmers in a given locality, and every effort is made to keep local notables from dominating the group. Organizational issues and group structure are addressed in the third or fourth year with the people who really have fully understood and adopted the technical part of the system, people who have made money from their fish farming operation and by those who want to invest and develop fish farming as a business.

The largest group the project currently has is 10 fish farmers in one village and 10 candidates waiting to become involved as soon as their own resources to develop their project site and PPGF resources permit. In Côte d'Ivoire where APDRA-F was running a similar project successfully for over 15 years, some groups had reached 100 members before hostilities broke out.

This level of development and large nuclei of farmers who understand fish production makes possible for much of the knowledge transfer to take place between peers rather than from project staff. The project has devoted considerable resources to understanding how information is transmitted among group members, dependent on special experience of individual members in certain aspects of the system (overflow pipes called *moines*, dam construction, and spillways) rather than dominance of the entire process by a single lead farmer.

One reason groups are necessary is that obtaining fingerlings of appropriate species and at the time they are needed constitute a high initial cost for the system. Where groups develop, farmers make arrangements among themselves to exchange fingerlings and to have them available when their neighbors

need them. The project encourages farmers to make the largest dam and the biggest pond surface possible because of economies of scale.

A fish yield of 700 kg per annum in two harvests is being achieved already by some farmers (as well as five MT/ha/year of rice from some ponds). Fish prices average about FG 2,250 (US\$1.13) per kg and most sales take place on the farmers' own property but not right by the pond itself (to reduce theft). Fish production in 2003 already reached 15 MT per year. The project goal is to develop 100 ha of ponds and 300 fish farmers at the end of the first phase. It is probable that there will be a second phase of the project.

For this type of a project to work, good technical assistance is needed. A six-year project costs about two million Euros; a three-year project is about one million Euros. It would be possible to reach 500 farmers in six years, to develop 150 ha and to achieve 150 MT a year in fish production by the end of the project. The longer finance is available, the more profitable this type of project is, because it is exponential growth with the greatest growth occurring toward the end of the project.

The production system promoted by APDRA-FF lends itself well to joint production of fish and rice on a high percentage of the pond area, contributing to overall system profitability without detracting from revenues from fish production. (This system is discussed in Section 7.2 as one of the rice production subsystems.)

Constraints

The biomass system is of limited interest because of the mixture of species and the treatment of fish production as a by-product of rice production rather than the other way around. This approach is unlikely to lead to big increases in farmer interest in or income from fish production, though some improvement in local diet can result.

The FAO-TCP project stimulated farmer interest in aquaculture. It has been surprisingly successful considering the short period of time available to the project from start to finish. It has stimulated great enthusiasm for fish farming among the rural populace. Nevertheless it is apparent that new projects will want to adopt a different approach in-line with that used by PPGF.

The fact that the new AfDB-funded aquaculture project does not specifically endorse and standardize on the PPGF approach is one of its most unfortunate features.

Opportunities and Potential Interventions

APDRA-F has developed a proven methodology and technical approach to the development of fish farming in West Africa based on its long experience in Côte d'Ivoire and elsewhere in West Africa. Its PPGF project based in N'zérékoré has shown that the adaptation of this approach to conditions in Guinée Forestière is the best system for development of aquaculture in that region and by extension to other regions of Guinea, including Guékedou where the return of more peaceful conditions make it possible to restart activities. With demand being strong for fresh fish strong in rural areas throughout Guinea where only dried and smoked fish are currently available, the PPGF approach could be adopted throughout the country as part of a strategy to develop *bas fonds* for intensive production of rice, vegetables and fish. USAID has proven ability in running successful stand-alone aquaculture projects elsewhere in West Africa. There is no reason why aquaculture cannot be successfully integrated into its new strategy to promote tenure security and environmentally sound agricultural development of *bas fonds* throughout the country and to install intensive production systems which increase farm income while improving nutrition for the rural populace in a commercially viable and environmentally appropriate way.

7.12 Livestock and Poultry

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

7.13 Input Supply

[Analysis in this subject area is proposed, should additional Level of Effort become available.]

8.0 RECOMMENDATIONS FOR FUTURE USAID/GUINEA INTERVENTIONS TOWARD SUSTAINABLE AGRICULTURAL DEVELOPMENT

Guinea's agriculture sector can contribute directly towards poverty reduction in the near term. What Guinea lacks for the moment is the political will to make appropriate investments in capital, human resource, and appropriate policies to link Guinea's producers with a "marketplace." It does not matter which market place producers are linked to but a free and monetized economy will undoubtedly assist Guinea reach the pinnacle it needs to effectively reduce poverty. USAID/Guinea should actively assist Guinea primarily through policy dialogue either directly or in consonance with other donor partners. The most recent USAID Agriculture Sector Strategy defined the terms which will allow USAID/Guinea to move towards regaining its position as an ardent supporter of sustainable agriculture production programs in Guinea, "ideal partners for USAID supported agricultural development efforts will be those countries that have put in place policies that encourage greater agricultural productivity and sound environmental management, infrastructure that enable markets to work efficiently, research institutions that assure a flow of new and adapted technologies to producers and education and information systems that support investments in human capital and put producers and agribusinesses in touch with information they need to be effective market participants."

It is the opinion of the Assessment Team as a result of our investigations and analyses that Guinea policymakers and program leaders must establish this new partnership with donors who will be in the sector for the long-term with assistance readily available to support worth programs as the policy environment improves. There is no geographical or geopolitical reason why Guinea could not or should not be induced to meet this USAID agricultural partnership criteria. It is thus important that USAID/Guinea and other donors in the agricultural sector work closely with the GOG and Guinea's agricultural producers association to develop market oriented production that can expeditiously be link up to global trade and investment network. The upcoming LPDA III consultation provide a fortuitous "learning together, acting together, evaluating together" opportunity through which a sustainable agricultural outreach agenda could be established.

There are, however, a number of sector activities that could be undertaken while the GOG and the donor community intensify efforts in the policy arena. USAID should consider the following:

- 1) Investment, based on enforceable Land Tenure Contract and Public Lands co-management protocols in NRM and the Sustainable Intensification of Agriculture. In certain zones in Guinea, measurable progress has been achieved with contract land tenure practices. A countrywide set of programs must be implemented through the PACV-CRD network that will help establish, enforce and evaluated land tenure contracts. Local CRDs should become very active in enforcing forestry policy, expanding eco-tourism investments (if developed) and promoting a national dialogue on land tenure policy (e.g., ownership, contract tenure, reallocation of land use).
- 2) Extension, through producers organizations, of improved cropping practices and farm-level support systems including local and regional market development. It is incumbent on the GOG's policymakers and donor organization representatives to place emphasis on a market driven agricultural sector development, where the main feature is predicated on increased and sustainable agricultural production. Future programs should seek ways and means to introduce modern agricultural marketing, processing and institute production methods that will strengthen small farmers and farmer groups in strategic partnerships.
- 3) Collaborative policy development (see LPDA III), market information, land-use monitoring, and project evaluation programs. The development of LPDA III offers USAID/Guinea and other donors the unique opportunity to "restart" partnerships with the GOG towards developing sustainable

agricultural production programs clearly linked to regional and international markets. A terms of reference (Annex 9) has been drafted for consideration by USAID/Guinea and other donors. The Assessment Team views development of LPDA III as a concrete forum to reshape agricultural policy and programs that will lead to increased growth and poverty reduction. An effective LPDA III would also address the requirement for continuing institutional reforms, capacity building, and investments. Activities undertaken in these areas will permit necessary reforms that will enable future private sector partners and the GOG to achieve positive results.

- 4) Negotiation, and, when appropriate, implementation of a risk-free agribusiness invest promotion agenda. While an invigorated LPDA III will set the stage for liberalization of markets and investment within the rural sector, here lies an opportunity to involve both regional and international actors that will clearly encourage African ownership operating in a transparent system with enforceable laws and regulations. The GOG and donors might consider focussing on a select group of commercial activities that have the potential for high payoffs and permit the partners to better achieve results that will lend them selves to expanded trade and investment opportunities. The cotton subsector could be revived with appropriate production strategies, marketing, and investment programs. In sum, some form of export promotion is needed that will effectively provide assistance to firms (local, regional, international) access the market place and establish marketing information systems. There is a clear requirement to expand ACA's activities or establish other promotion activities that will leverage policy support for trade and investment in the agricultural sector. The introduction of new technologies could also be subsumed in export promotion programs in addition to assistance towards improving business plans, credit, WTO policy interpretation, and world market assessments (local product Web site).

8.1 Priority Interventions

8.1.1 Rice under Sustainable Production Systems

Guinea's current food security policy sets rice self-sufficiency (and even the promotion of eventual rice exports) as its objective. This priority, particularly when unaccompanied by hardly any investment in irrigation infrastructure, encourages an inefficient use of resources (hillside rice in an open economy such as Guinea's). Yet rice self-reliance, particularly for the farm family, must still remain a foundation for the cash crop, competitiveness of the farm enterprise. Therefore, rice production under intensive, though not always high input, production systems must be developed. Currently most rice (65%) is being produced in upland areas contributing to environmental degradation as hillsides better adapted to tree crop production are eroded, along with farmers' time, labor and other resources providing meager yields and being subject to the vagaries of weather, birds and other pests. At the same time, a number of sustainable rice production alternatives exist. High rice yields can be maintained on level bottomlands, while fragile, hillside land can be protected better by perennial tree crops or managed grasslands. Such land-use alternative systems should be promoted. Farm families with land tenure access to only lower value hillside land would have to be given equitable, long-term contracts to the improved bottomland. If not bottomland in a more co-operative community should be improved. The GASA Team is cognizant of the efforts to improve hillside rice production with more efficient rice varieties such as nerika, however, the GOG and rice extension personnel should not lose sight of conservation practices needed to safeguard hillsides from degradation.

8.1.2 Other Rural Infrastructure

This same *quid pro quo* should apply to the range of local infrastructure being made available to CRDs through the World Bank's flagship, project in Guinea, PACV. Sub-prefectures where rural communities are deliberating trying to get poor farm families out of their slash-and-burn, hillside rice survival system, down, through long-term land tenure contracts, onto improved, irrigated bottomland, should be given funding preference under PACV. PACV is already a focus of rural poverty reduction efforts for several

donors. By linking it to USAID's (and perhaps LPDA III's) land-use change agenda, even more donor money could be expected to rally around the process.

8.1.3 Aquaculture

Tilapia and other species in pond systems constructed in *bas fonds* (as part of the overall strategy of intensifying production in *bas fonds*) provide fresh fish to the ready markets in rural areas. Intensive production systems have proven profitable in the PPGF pilot project. In addition to providing high quality protein to the rural population and income to producers from the fish sales, many ponds are adapted to intensive transplanted rice production with no other inputs and without compromising fish production and income from pond-side sales of fish.

8.1.4 *Bas fonds* Vegetable Crops

Market-oriented vegetable production has become a major source of income for small farmers, particularly women, in all parts of the country. Much of the production is carried out in *bas fonds* during the dry season. Focused on product sales, revenues provided for family food security during months when food reserves are scarce or non-existent, allowing families to purchase much-needed food. The main vegetables grown include onions, potatoes, tomatoes, eggplant, fresh maize, and fresh peppers. Sales are oriented to the markets of Conakry and other cities and towns as well as to exports to Senegal (particularly the huge Dakar market), Guinea-Bissau, and the Gambia, and with the coming of peace, to Sierra Leone and Liberia (possibly more activity under Mano River Union) as well. Investment in improving *bas fonds* with better fencing and improved water control will allow intensive dry-season vegetable production after a rainy season crop of rice and will make possible year-round use of the land in crop production, thus contributing to raising farm incomes.

8.1.5 Mango Production for Export

The Assessment Team noted that Guinea's comparative advantage in mango production is reduced by the lack of cold storage, the high cost of packing materials, high cost of sea container rates, and inefficiencies at the port. Despite these shortcomings returns to producers from mango production is the highest for any crop produced in Guinea during the period 1995-2002. Guinea mangos are finding their way to Europe either directly from Guinea, or through Mali's mango export system, with the assistance of ACA.

8.1.6 Cashew Production

Commercial cashew production is occurring spontaneously as well as being promoted by various projects. Current programs involve a package of technology and farmer organization support with a component for small scale processing operated at the village level. More importantly, cashew production serves as an alternative to hillside rice cultivation, and it addresses gender dimensions in the agricultural sector by productive employment for women in cashew processing.

8.1.7 Small Farmer Oil Palm

Annual vegetable oil imports have averaged over 19,000 MT in recent years and palm oil prices have risen dramatically in recent months. Exports to neighboring countries are thought to be about 9,000 MT per year at present while price differentials favor additional export sales. Small farmers account for 80% of oil palm production. Thus there is a tremendous potential for increasing small farmer incomes, improving nutrition and enhancing food security through programs supporting the spontaneous increases in small farmer palm oil production already taking place.

8.1.8 Human Resource Development

Technical Training

Efforts must be made to strengthen local capacity for integrated management of agricultural and NRM operations. While there is considerable progress being made in the Enlarged Natural Resources Management program funded by USAID/Guinea, more attention is needed on sustainable agricultural production constraints dealing with technology improvement through adaptive research, input technology and distribution, cooperative development (marketing) and infrastructure planning.

Support to Rural Organizations Management and Development Programs

The GASA Team was highly impressed with the quality of technical and policy leadership in a number of PVOs working in the rural sector. A program to build human and institutional capacity in rural areas will enhance the ability of rural groups to manage activities related to improvement in cultivation technology, adaptive research, market development, and information systems.

Long-term Training for Key GOG Personnel

Monitoring and evaluation of poverty reduction economic data and indicators require specialized technical knowledge in a number of areas. USAID/Guinea should consider long-term support to the GOG Office of Planning and Programs to develop capacity to plan and assess the real impact of rural sector economic growth on poverty reduction. Planning capacity is also required to assist both government and private sector entities evaluate investment options in the rural sector. Similar long-term support for selected crops for agricultural statistics is needed to provide a solid basis for agricultural planning and policy decisions.

8.1.9 Donor Coordination

The GASA Assessment Team was highly impressed by the interest displayed by donor representatives invited to participate in both entrance and exit briefings of the Assessment Team while in Guinea. The Team noted some seemingly intractable positions (legislating markets and marketing activities to “crony capitalists”) implemented by the GOG in the rural sector. We are highly optimistic that both technical and policy barriers may be reduced through a common agenda and monthly dialogues with government of Guinea spokespersons. We urge that the FAO and seconded by USAID/Guinea serve as the secretariat for frequent donor meetings for sharing information, strategic planning, evaluations, and resolution of constraints/issues in the rural sector. In sum, the GOG and donors need to restart their partnerships to raise the profile of rural development programs as the key to economic performance and poverty reduction. This will be a grand opportunity to apply USAID’s comparative advantage with highly qualified technical field personnel to implement the Agency’s new agricultural strategy. Elements of that strategy if implemented in Guinea, would apply solutions on key issues affecting the enabling environment and enterprise development that are key functions necessary to spur economic growth and reduce poverty.

8.2 Current Activities to Continue

8.2.1 Food Security DAPs

Current programs being implemented by OICI, AFRICARE, and ADRA are providing valuable technical assistance in agricultural production, food preservation, and enterprise development in Guinea’s food insecure area. While the GASA Team saw no one block buster approach or activity that, if extended throughout the country would overcome the full range of constraints to transforming the rural economy, the Team did see many cases where progress was being achieved in overcoming one or more of those constraints. We saw some cases where improved cultural practices, inputs, and enterprise management

training program helped food insecure people diversify household economies and capitalize on a range of revenue-generating opportunities.

8.2.2 Microfinance

PRIDE and CLUSA programs should be continued and expanded to coordinate with private sector entities that provide marketing services to producers. The GASA Team found that microfinance programs currently operating in Guinea, continues to be critical in increasing agricultural productivity and income generation which are key elements towards poverty alleviation. The GASA Team also notes the importance of continuing development of democratically elected, business-run producer groups as the foundation of any sustainable agricultural development strategy. These business-run producer groups can be developed around a wide range of agricultural sector activities where participants get access to goods and services that they could not access as individuals outside of these groups.

8.2.3 Co-management of Natural Resources

The technical assistance programs managed by Winrock International should be continued and expanded to include an aggressive program that will provide alternatives for hillside rice production systems and extension of its co-management programs to other regions in Guinea. Co-management should be expanded from forestry to include water bodies and fisheries. Guinea must reverse practices that lead to degradation of land linked to inappropriate cultivation practices and deforestation linked to unsustainable harvesting of timber. The GASA Team saw examples of forestry management by a large commercial sawmill operation promoting co-managed activities that appeared to be sustainable over the long term.

8.3 Interventions of Lower Priority

8.3.1 Investments in Irrigation

Guinea's irrigation potential is enormous and provides a medium to address upland degradation problems with hillside rice cultivation practices by moving marginal rice producers from hillsides to more fertile lands. Guinea irrigation land potential is estimated to be 364,000 ha and of this amount approximately 28,5000 ha are fully developed and 52,778 ha are partially under managed systems. While current policies are to develop irrigation lands in favor of rice cultivation, there are other crops that may have greater comparative advantage due to the prevailing world market prices for rice that are more competitive than rice that can be obtained cheaply from Asian producers. Focus should be on small-scale community systems (*bas fonds*, small plains) and not the vast irrigation projects of the past. The GASA Team recommends that USAID in collaboration with other donors to finance/support an irrigation assessment to examine investment options (public, private), small- and medium-scale systems, and cropping systems. Land tenure and land access issues need to be settled by community contracts prior to investment in irrigation drainage systems to assure that small farmers benefit.

8.3.2 Investments in Rural Roads and Critical Points

Nearly 7,000 kilometers of rural roads were developed under PNIR1 and most of these roads are still functional, however, efforts to sustain the rural road networks with organized maintenance programs by rural management councils have not been implemented. The GOG has identified 19 critical points (need for bridges to replace ferry transport across streams). Six bridges have been constructed to date while investment capital is being sought primarily through French and World Bank assistance programs. There is also a need for assistance in geo-referencing technology to identify critical points as well as additional land suitable for irrigation. If measurable improvement is achieved in empowerment of village committees at the CRD level through a continuing PACV program, USAID and other donors could support additional investments that are predicated on infrastructure, enabling policies and governance that are key for rural groups to benefit more from their own active involvement in local affairs. The GASA

Team recommends that USAID in collaboration with other donors support development of a geo-referencing entity with the GOG to support multiple rural development programs.

8.3.3 Ecological Tourism

At kilometer 36, just outside of Conakry's city limit, one encounters a beautiful landscape that could easily be sold to a host of world visitors if minimal needs for tourists were met in Guinea. Adding the attraction of Guinea's cultural setting, the country could fulfill both cultural and ecological tourism interests for a large segment of Americans. Ecological and cultural tourism is not a far-fetched idea since Guinea's neighbors (Senegal, Gambia, and Mali) have such programs in absence of a striking landscape as Guinea has to offer. The GASA Team strongly recommends that an ecotourism assessment be performed to evaluate options for investment (public, private) and economic benefits that will accrue to inhabitants of rural villages and tour operators and to the GOG.

8.3.4 Value-added Processing Industries

It is a commonly held fact that Guinea's fruits and vegetable produce are of high quality. To maximize earning on agricultural produce, there are a number of value-added industries that could be easily managed by private sector entities provide that suitable policies exist that promote and protect agricultural sector investments (e.g., juice factories, concentrates, dried specialty fruits, cooking oils, and cosmetic products). There are limited factor that must be overcome to make such investments viable, e.g. reduction in transport costs, improved energy systems (electricity), management training, market identification. Any investment in value-added industries must be should consider progress being made to remove barriers to entry/exit in the marketplace. A transparent system and respect for commercial law would be required to attract investors.

ANNEXES

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Annex 2: List of NGOs

Annex 3: List of PVOs

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Annex 5: List of Persons Contacted

Annex 6: List of Agriculture Sector Businesses

Annex 7: GASA Scope of Work

Annex 8: Natural Resource Management Best Practices

Annex 9: LPDA2 Terms of Reference

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ANNEX 2: LIST OF NGOS

Matam Commune

AGAPE	Association Guinéenne par l'Assainissement et la protection de l'Environnement
OJVDMR	Organisation des Jeunes Volontaires pour le Développement en Milieu rural
APDR	Association pour la Promotion du Développement Rural

Dixinn Commune

EUPD	Entraî le Universitaire pour le développement
CREPA	Centre Régional pour l'Eau Portable et l'Assainissement
G.E	Guinée-Ecologie
AGCE	Association Guinéenne des Chercheurs en Environnement

Kaloum Commune

Volontaires Guinéens pour l'Environnement

Matoto Commune

ADEZORUPE	Association pour le Développement des Zones Rurales et la Protection de l'Environnement
UCVD	Union Guinéenne des Volontaire pour le Développement (Labé) Association pour le Développement Rural Intègre pour le Développement de Dubreka (Aménagement, transport et Assainissement) (Conakry)
APPA/GUINEE	Association Guinéenne de l'aire a la Paysannerie de Guinée
AGAC	Association Guinéenne pour l'Assainissement de la Ville de Conakry Labé Ville propre
AGFD	Association Guinéenne des Femmes pour la lutte contre la Déforestation
AGUIFAC	Association Guinéenne des Femmes pour l'Assainissement de la ville de Conakry
AVP	Association des Volontaire du Projets
AZORE	Association pour le développement des Zones Rurales et la protection de l'Environnement
COFEG	Coordination des ONG Féminine de Guinée
FORUM	ONG pour le Développement Durable

FONG	Fédération des ONG de Guinée
CAJEG	Coordination des Associations de Jeunesse de Guinée
AGPEED	Association Guinéenne pour l'Education à l'Environnement et au Développement
APSE	Association pour la Promotion de la Santé et de l'Environnement
AEES	Association pour l'Education, l'Environnement et la Santé
AGFD	Association pour la lutte contre la Déforestation
AAPRODAG/G	Association pour l'appui, la promotion, et le Développement des Communautaires de Guinée actions Communautaires de Guinée
AGEMAF	Association Guinéenne pour l'Environnement Marin et Flurial
ACE	Association des Chercheurs en environnement
OGPE	Organisation Guinéenne pour la protection de l'Environnement
ARESPROTEN	Association pour la Restauration et la Protection de l'Environnement
AJEPMIC	Association des Jeunes pour la Protection de l'Environnement
AVES	Association des Volontaires pour l'Environnement et la Sante
ACPS	Association Chaîne de Protection et la Poliolante
AGRETAGE	Association Guinéenne pour la Recherche et la Promotion de Technologie

Alternative de Gestion de l'Environnement

Badiar Vert	Association pour la protection du Mount Badiar
FG	Flore de Guinée

ANNEX 3: LIST OF PVOS

1. ADRA
2. AFRICARE
3. CARE
4. CLUSA
5. OICI
6. PRIDE

ANNEX 4: LIST OF INTERNATIONAL AND MULTILATERAL DONORS

- | | |
|----------|--|
| 1. AfDB | African Development Bank |
| 2. AFD | <i>Agence Française du Développement</i> (France) |
| 3. CIDA | Canadian International Development Agency |
| 4. GTZ | German Technical Assistance Agency |
| 5. IFAD | International Food and Agricultural Development Agency |
| 6. IMF | International Monetary Fund |
| 8. JICA | Japanese International Cooperation Agency |
| 9. EU | European Union |
| 10. UNDP | United Nations Development Program |
| 11. WB | World Bank |

ANNEX 5: LIST OF PERSONS CONTACTED

List of People Contacted

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ANNEX 6: LIST OF AGRICULTURE-SECTOR BUSINESSES

CGDT	<i>Companie Guinean de Développement Textiles</i>
SOBERGUI	<i>Société Brasserie Guinean</i>
SOGUIPAH	<i>Société Guinean de Palmier a Huile et d'Heveas</i>
SPCIA	<i>Société de Production et de Commercialisation d'Intrants Agricoles</i>

ANNEX 7: GASA SCOPE OF WORK

STATEMENT OF WORK FOR THE AGRICULTURAL SECTOR ASSESSMENT

I. BACKGROUND

The USAID/Guinea Mission goal under the current Country Strategic Plan (1998-2005) is to improve the economic and social well-being of all Guineans in a participatory society. This goal will be reached through development assistance programs and activities implemented under four Strategic Objectives (SOs): Natural Resource Management (NRM); Health and Population; Basic Education; and Democracy and Governance. In addition, a new two-year Post-Conflict Transition Special Objective will be implemented in the Forest Region in the second quarter of FY 2003.

The Natural Resource Management Strategic Objective (NRM SO) focuses on increasing the use of sustainable natural resource management practices by Guinean small landholders through: (1) improving the natural resource management capacity of community-based organizations; (2) increasing sustainable farm productivity; (3) developing income-generating non-farm small and microenterprises; and (4) establishing a policy environment which empowers local populations to manage their natural resources and promotes long-term investments to conserve the resource base. The design and implementation of the NRM SO activities are based on the participatory approach, economic incentive, demand-driven intervention, and focus on results. Furthermore, the achievement of this Strategic Objective will give rise to economic impacts such as increased and diversified household income in the rural area.

The following activities are currently implemented under the NRM Strategic Objective:

Expanded Natural Resource Management (ENRM) Project. This six-year multi-faceted project started in 1999 by Winrock International under a cooperative agreement with USAID/Guinea. The ENRM Project is the centerpiece activity for the NRM Strategic Objective and is expected to contribute the most to the achievement of the strategic objective and all intermediate results. Its activities are currently implemented in the prefectures of Kindia, Tougue, Lelouma, Dabola, Faranah, Kouroussa and Kissidougou. Winrock International implements this project through a partnership with Volunteers in Technical Assistance (VITA), Land O'Lakes, several Guinean non-government organizations (NGOs), and the Guinean National Directorate of Water and Forests. The ENRM Project recently underwent a mid-cycle review.

Guinea Rural Enterprise Development Project (GREDP). This microfinance project started in 1991 and is currently implemented by VITA under a cooperative agreement with USAID. Its completion date is July 2003. It aims to stimulate the development of micro- and small enterprises in urban and peri-urban areas. At present, the project has spawned two local NGOs: one is specialized in microfinance (PRIDE-Finance), the other focuses on enterprise training (PRIDE-Guinée). The GREDP contributes principally to the achievement of the results related to the development of micro- and small enterprises.

Health and Environmental Protection Action (HEPA). Under a limited scope grant agreement, this activity started operations in October 1998 and will end in September 2005. Its main purpose is to mitigate the impacts of the refugees from Sierra Leone and Liberia on the environment and to support local public health services delivery in three prefectures of the Forest Region. The implementation of the HEPA Project is presently integrated into the Winrock cooperative agreement.

Peace Corps Environment Initiative. This multi-year initiative has been implemented by Peace Corps since FY 1999 under an interagency agreement with USAID. It consists of an integrated program combining environmental education and natural resource management activities in Guinea aiming at improving the management of natural resources in Guinea by strengthening the capacity of local institutions, communities, and individuals to rationally manage their natural resources.

Title II PL 480 Program. Contributing to the achievement of the NRM SO results, principally in the areas of sustainable agriculture and microenterprise development are three food security projects: (1) OICT's Profitable Agriculture and Village Extension Project in Mamou; (2) ADRA's Sigiri Food Resource Improvement Project; and (3) Africare's Guinea Food Security Project in Dinguiraye.

Other Activities. Several new activities are expected to start in FY 2003 under the NRM SO: (1) Guinea Sustainable Tree Crop Program (GSTCP) with an initial focus on cashew nuts; (2) Applied Biotechnology Project supporting the application of biotechnologies to the development of improved planting materials; (3) Improved Seed Multiplication Project aiming at developing private sector capacity to meet farmers' demand for improved seeds of major cash crops and food crops in Guinea; and (4) Chimpanzee Protection Project.

The formulation of this Natural Resource Management Strategic Objective was based on the results of the Guinea agricultural sector assessment conducted in early 1997 and subsequent reviews of the Mission's program impacts. As the current CSP will end in FY 2005, USAID/Guinea is in the process of developing a new strategy which is to start in FY 2006.

There have been tremendous social, economic and political changes in Guinea since the 1997 agricultural sector assessment. As a result, another assessment, which will provide up-to-date information regarding the Guinean agricultural sector, is deemed necessary. The results and recommendations of this assessment will assist the Mission in formulating its new strategies and objectives for the agricultural sector under its next Country Strategic Plan.

II. OBJECTIVE

The purpose of this delivery order is to procure an agricultural sector assessment in Guinea with resulting outputs and deliverables fully described below.

This Guinea Agricultural Sector Assessment (GASA) has three major objectives:

- to obtain up-to-date information related to the agricultural sector and assess the magnitude of its contribution to poverty reduction and economic growth in Guinea;
- to do an in-depth analysis of key agricultural subsectors to identify their constraints, opportunities and potential interventions for development;
- to identify a number of areas, where and how possible future USAID interventions in agriculture in Guinea can most effectively contribute to Guinea's economic growth (esp. through sustainable agricultural development, rational natural resource management, and enterprise development, etc.).

III. SCOPE OF WORK

A. Contractor's Outputs

The Contractor shall conduct the Guinea agricultural sector assessment and elaborate a complete report on the assessment. This report shall include, but not be limited to, the items listed below:

1. Overview of Guinea's Economic Performance and Agricultural Development
 - Guinean economic performance, including the contribution of agriculture to Guinea's overall economy over time, including consideration of the adverse effects of corruption
 - Agricultural statistics (areas, total production, marketed quantities, yields, etc.) for the last 10 years for major crops pending availability of data, including but not limited to onions, tomatoes, hot peppers, pineapples, mangoes, citrus, avocado, bananas, coffee, cacao, cashew nuts, rice, maize, peanuts, oil palm, cotton, rubber, potatoes, cassava and other tubers.
 - Guinean government objectives with special focus on its poverty reduction strategy, rural development strategy, agricultural reforms and structural adjustments.
 - Development assistance activities of USAID and other donors.
 - Input statistics, including seeds, fertilizers, pesticides, machinery, etc.

2. Importance of Agricultural Development to Poverty Alleviation in Guinea
 - Contribution of agriculture to income generation, food security and employment growth.
 - Implications for poverty reduction.

3. Analysis of Strategic Opportunities and Challenges for Key Agricultural Subsectors (Subsector organization, competitiveness and value-added potential, constraints, opportunities and potential interventions, growth linkages), especially as they relate to on/off farm agribusiness/enterprises.
 - Cotton
 - Rice
 - Cassava
 - Potato
 - Peanut
 - Maize
 - Oil Palm
 - Fruit and Tree Crops: (e.g. mango, citrus, avocado, pineapple, banana, coffee, cacao, cashew)
 - Vegetable Crops: (e.g. tomato, onion, green bean, hot pepper, other tubers, eggplant)
 - Non-timber forest products: shea, nere, honey, medicinal plants, others
 - Rubber
 - Fisheries
 - Poultry and livestock
 - Input Supply: Seeds, fertilizers (chemical/organic), pesticides, tools and equipment.

4. Analysis of Enabling Environment for Agricultural Development (The analysis should also include opportunities and potential interventions and an overall assessment of the conduciveness of Guinea's trade policy to agribusiness development)
 - Overall policy environment
 - Regulatory framework and jurisdiction (e.g. enforcement, prosecution, corruption)
 - Finance with special attention to agricultural credits and microfinance: Monetary policy, banking practices of commercial banks, microfinance
 - Grades and standards
 - Transport

- Communications
 - Roads
 - Storage
 - Electricity
 - Water Supply Systems
 - Agricultural research and technology development
 - Transfer of information and technology, and human resource development
 - Market infrastructure and information
 - Domestic, regional and international market development
 - Land tenure
 - Availability of inputs (seeds, fertilizers, pesticides, tools and equipment)
 - Organizational and technical capacity of producer organizations, cooperatives, business and trade associations, and private agricultural input distributors with regard to the development of agricultural production and trade
 - The current status and potential roles of multinational supermarkets in market organization, standard setting, and food retail.
5. Analysis of Other Important Issues Affecting Agricultural Productivity and Economic Growth
- HIV/AIDS
 - ✓ Prevalence of HIV/AIDS.
 - ✓ Impact of HIV/AIDS on land tenure, agricultural productivity and rural income growth.
 - ✓ HIV/AIDS prevention strategy of USAID, other donors, and GOG for the agricultural sector.
 - Natural Resource Management
 - ✓ Description of land use and potential for agricultural production, and the problems of soil degradation.
 - ✓ Description of the current status of forest resources and problems in conserving and protecting forests, including degree of misuse (overexploitation, illegal logging).
 - ✓ Assessment of natural resource management activities being implemented by USAID and other donors, and an assessment, as appropriate, of reductions of adverse impacts on the natural resource base, and/or increase household income, reduce poverty or increase food security.
 - ✓ Degradation due to livestock and fisheries
 - Gender
 - ✓ Assessment of Guinean women’s role in agricultural production, agribusiness, and natural resource management;
 - ✓ Identification of income-generating opportunities and appropriate technologies for women and assess impact on well being of women.
 - ✓ Recommendations for improvement of women’s well-being through agricultural and natural resource management activities.
 - ✓ Rural exodus
6. Recommendations for USAID

- Comparative advantages of USAID in the agricultural sector, including overlaps and gaps among and between donors
- Analysis of trends within USAID and among other donors.
- Assessment of major proposed agricultural interventions, including the development of a minimum of three strategic options to increase rural income and food security.
- Identify current opportunities for Public Private Alliance and growth areas for future alliances
- Activities to be continued to capitalize on benefits of current intervention

B. Contractor's Activities

The Contractor will achieve the above outputs through the following activities:

- Review published or unpublished relevant documents made available by the Government of Guinea (GOG), USAID, the World Bank, IMF, the UNDP, and other donors or international organizations.
- Interview and dialogue with relevant people in the Guinean public and private sectors, USAID, other donor organizations, the UNDP, International Financial Institutions, NGOs;
- Visit locations outside Conakry to interview local authorities and organizations, farmers, and agribusiness participants;
- Analyze data gathered through the first three undertakings and from other sources. USAID/Guinea will assist the assessment team in collecting background information, by assembling and identifying available documents, and making initial appointments and introductions to relevant persons.
- Analyze best practices and failures of projects implemented by other USAID Missions and/or other donors in the agricultural sector.

IV. REPORT

A. Reporting Responsibility and Schedule

Within one week after the arrival of the Contractor's team in Guinea, the contractor shall present to the USAID/Guinea NRM Strategic Objective Team Leader a detailed outline of the GASA report. The outline shall be based on the discussions with members of the NRM SO Team and the Strategic Planning and Results Center (SPRC) and on Sections II A and B of the Statement of Work, described above, plus any needed adjustments.

At approximately four weeks into the work, the Contractor team shall give a mid-point debriefing to designated USAID/Guinea staff.

At least seven working days before the departure of the Contractor's team; the Contractor shall submit the first draft of the GASA report. The NRM Team Leader will set a date for the Contractor's oral presentation on the draft report, at which time USAID/Guinea will provide oral and written comments to be incorporated in the second draft of the report.

One working day before the team's departure, the second draft of the GASA report, including all its annexes, shall be submitted to the NRM SO Team Leader.

The Mission will submit its comments to the contractor within one week after receipt of the second draft of the report.

Within two weeks after receipt of the Mission's comments on the second draft of the report, the contractor shall deliver to USAID/Guinea by express mail:

- a) ten copies of the final version of the GASA report in English, not to exceed 30 pages, excluding attachments, charts, tables maps, etc., typed in single space, each sheet printed on both sides; and
- b) electronically on 3 1/2 inch diskettes containing the final version of the GASA report, formatted in MS Word 2000 for text and Excel 2000 for charts, graphs and tables.

B. Acceptability of the Report

The acceptability of the assessment report will be based on the following criteria:

- a) The inclusion of all information described in Sections II.A and B of this Statement of Work with adequate details;
- b) The use of appropriate methodologies for, and the thoroughness of, all required analyses and evaluations;
- c) The collection and use of the most recent and accurate data and information for the assessment with statement(s) attesting to the validity and quality of data obtained.
- d) The completeness of the report including charts, tables, maps, bibliographies, abbreviations, acronyms and annexes;
- e) The reasonably good presentation of the report, with no more than five typographical errors; and
- f) The timely submission of the report according to the schedule and conditions indicated in the previous section "Reporting Responsibility and Schedule".

Final approval of the deliverables rests with the USAID/Guinea Director.

C. Technical Directions

Technical Directions during the performance of this delivery order shall be provided by the USAID/Guinea's NRM SO Team Leader, the Project Officer as stated in Block 5 of the cover page, pursuant to Section F of the contract. All coordination with the Government of Guinea shall be done through the NRM SO Team Leader. Periodic meetings between the NRM SO Team, SPRC Team, and the Contractor's team will be held for progress monitoring or making changes in the work plan, the report outline, or the report itself.

V. TERMS OF PERFORMANCE

1. Work shall commence within 30 days of project award. The final report shall be submitted no later than 90 days after project award, except as specified below.
2. Subject to the ceiling price of this delivery order and the prior written approval of the Project Officer, the contractor may extend the estimated completion date, provided that the extension does not cause the elapsed time for completion of the work, including the furnishing of all deliverables, to extend beyond 30 calendar days from the original estimated completion date. Prior to the original estimated completion date, the contractor shall provide a copy of the Project Officer's written approval for any extension of the term of this delivery order to the

Contracting Officer; in addition, the contractor shall attach a copy of the Project Officer's approval to the final voucher submitted for payment.

3. It is the contractor's responsibility to ensure that the Project Officer-approved adjustments to the original estimated completion date do not result in costs incurred that exceed the ceiling price of this delivery order. Under no circumstances shall such adjustments authorize the contractor to be paid any sum in excess of the delivery order.
4. Adjustments that will cause the elapsed time for completion of the work to exceed the original estimated completion date by more than 30 calendar days must be approved in advance by the Contracting Officer.

ANNEX 8: ASSESSMENT OF NATURAL RESOURCE MANAGEMENT BEST PRACTICES

Please see enclosed Adobe Acrobat file entitled “Annex 8.”

ANNEX 9: LPDA2 TERMS OF REFERENCE

Please see enclosed Adobe Acrobat file entitled “Annex 9.”