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EVALUATION OF THE ADRA/GUINEA TITLE II FUNDED WOMEN'S GARDENING PROJECT IN SIGUIRI

1. Introduction

Guinea is classified by the UNDP as among the poorest and least developed countries in the world. The country remains a Low Income Food Deficit Country, ranking 162th out of 174 countries in terms of quality of life (in the UNDP 2000 Human Development Index). Approximately 40% of Guinea's population lives in absolute poverty with less than \$300 annual per capita consumption, and 13% live in extreme poverty with less than \$175 annual per capita consumption.

Groups most affected by poverty are small farmers, youth, and most especially, women, who paradoxically play an important role in agricultural production. Around 55% of subsistence farmer households are considered very poor, contributing to 68% of national poverty (Ministry of Planning and Cooperation, Republic of Guinea, March 1999). Specific prefectures where poverty was identified as dominant are: Mandiana, Siguiiri and Dinguiraye in Upper Guinea; Mali and Koubia in Middle Guinea; and Telimele in Lower Guinea (Guinea Ministry of Agriculture and Animal Husbandry, and FAO, October 2001).

The Siguiiri Prefecture –Adventist Development and Relief Agency (ADRA)/Guinea's intervention zone - is one of the poorest regions in Guinea. The Siguiiri prefecture is characterized by a unique rainy season for four months (June through October each year). Total rainfall ranges from an average of 1,400mm in the south-west to 1,100 mm in the north-west of the prefecture. The principal crops grown in Siguiiri are cotton, irrigated rice, corn, and groundnut. Agricultural productivity in general in Upper Guinea is low; average on farm yields are 1,380 kg/ha for irrigated rice, 650 kg/ha for corn and 720 kg/ha for groundnut (Enquête Agricole Nationale, 1996). Participatory rural appraisal (PRA) carried out by ADRA in 1999 indicated that food storage during the *soudure* period was still more acute in Siguiiri prefecture, where 75% of households were unable to meet their food needs throughout the year and suffered at least some level on intake restriction for an average of 5.5 months each year. Siguiiri's isolation from the rest of Guinea limits the population's access to improved technology and agricultural services. Reasons for food shortage in Siguiiri prefecture is related to an inability to produce and stock enough food to meet needs throughout the year; a shortfall in production due to a significant levels of post-harvest loss during storage (10-30% for corn and rice , 50% for

groundnut). Households' food supplies are often further depleted by a need to reimburse food loans or cash taken to meet food need prior to new harvests. Such loans are often associated with usurious rates of interest which result to reduce the household's capacity to retain sufficient food. Siguiri's household food security problems are also related to a food production deficit. Factors contributing to poor productivity are lack of well organized extension services; difficult access to agricultural input supplies by farmers; limited working capacity linked to the lack of farm equipment; low fertility of soils. Agricultural productivity in Siguiri is also negatively impacted by gold mining activities. Income diversification is affected by the limited access to economic opportunities or businesses. Importation of materials into and exportation of produce from the region is made difficult by poor road infrastructure that worsens during the rainy season

Gold mining is a traditional activity practiced in the *Mandé* region (border region between Mali and Guinea), near to Siguiri, by both men and women. Although there is an industrial gold mining company, most of the population is involved in artisanal, manual extraction between February and June. For certain villages, the active population temporarily moves to the gold mining zone during the off-season. This active population will not return to their farms until late June for land preparation and planting. The optimal time to prepare land is in May, so the late return of the population to farming affects agricultural production. According to a ADRA survey, gold mining is the main off-season activity for the majority of Siguiri's active population of women. The income generated from the gold mining in Siguiri is very low, and cannot assure the household's food subsistence during the hungry season.

ADRA's "Projet d'Augmentation des Ressources Alimentaires (PADRAS)" DAP approved by FFP in 2000 addresses the lack of food security in the Prefecture of Siguiri by improving food availability through increasing agricultural productivity and improving food access through micro-finance and income generating activities. Also, the PADRAS project addresses the population's limited access to credit by providing two types of credit. The first is available to farmer's groups to obtain oxen and plows. The second source of credit is opened to women's groups to engage in income generating activities including vegetable garden production, and small trading. In 2001 and 2002, a total of 28 groups made up of 797 clients were supported by PADRAS to cultivate approximately 43 hectares of land.

The objective of this case study is to evaluate the impact of women's gardening activities in Siguiri, which have been supported for the last two years by the PADRAS project. In 2003, PADRAS supported 1,600 women on gardening activities. Given the high involvement of Title II CSs in women gardening activities as means to achieve food security in West Africa, the fundamental question for decision makers is how sustainable are these activities? Do these activities contribute to the women beneficiaries' household food security? What are the production constraints that Siguiri women face with gardening activities? These are some of the key questions that this case study will try to answer.

2. Importance of women's gardening activities to food insecure households' food security some evidences from West Africa

Traditionally, gardening is a women's activity in West Africa, and production is used to help households achieve auto-consumption. In the Office du Niger zone in Mali, gardening activities were promoted as an income generating activity for women in addition to irrigated rice production (for household food consumption). In 2000, the Office du Niger zone had 7,000 hectares of gardens, and half of these surfaces belonged

to women (Chohin-Kupper - 2002) (Note that men are becoming increasingly interested, especially when gardens are an income generating activity.) The gross income from the off-season gardens in Office du Niger was estimated at 12 billions F CFA or \$20 million in 1999. Michigan State University (James Teft and al – 2002) reported that average monthly expenditures of women in the Office du Niger zone are two to four times higher than that of other women in other regions in Mali. According to the authors, income earned in horticulture production by women appears to be a primary factor differentiating higher expenditure levels for women in the Office du Niger zone. Furthermore, the results of this study show that both household and mothers' incomes are positively and significantly correlated with improved children's nutrition (higher Z-scores). The prevalence of stunting is significantly lower for children of mothers in the highest income quartile (24%) relatively to the levels for the three lower income quartiles (38-40%). The study concluded that a mother's income might need to reach a certain level before it can have a major impact on reducing children's malnutrition.

In the Zondoma province (Burkina Faso) Africare implemented 16 gardens around hand-dug wells for 725 women farmers, funded by FFP under a 2000 DAP. These gardens are manually irrigated from underground water using hand-dug wells. The depth of these wells can reach up to 20m, which negatively impact the productivity of gardening activities. During the project mid-term evaluation, the first three gardens implemented were evaluated in terms of impact on household's food security. The evaluation found that gardening activities in Zondoma are financially profitable. The net income per woman beneficiary varies from 30 000 FCFA (\$50) to 36,000 FCFA (\$60) in three months of activity. In cereal equivalent, these incomes correspond to 200 – 241 kg of cereal per woman beneficiary. These cereals can cover 25 – 31 days of household food consumption (14 persons per household food need, 190 kg/pers/year as consumption norm in Burkina Faso). For certain food insecure households, during the months of April-May where household food availability is low, cabbage leaves from gardens are mixed with cereal flour for household consumption. These cabbage leaves reduce the quantity of cereal to be used for household daily cereal consumption.

In year 1994, CRS/Burkina Faso implemented a market garden in the Lelesge village which is a food insecure village situated at 20 km from Ouagadougou the Burkina Faso capital city. The Lelesge market garden was implemented through a local NGO with a private funding (59,230,000 FCFA or \$100,000). The total surface of the garden is 13.5 hectares (7 hectares for men and 6.5 hectares for women). The garden is irrigated from the water of a dam using a motor pump for irrigation. A total of 332 individual farmers have benefited a garden plot (375 m² per beneficiary) while a village management committee has been created and trained for the garden management. This dynamic committee plays the role of interface between farmers and the project's clients. In four years of activity, the impact of the Lelesge market garden is great for beneficiaries. For example from 1995 to 1999, the Lelesge garden produced 100 -200 Mt of vegetable products (onion and cabbage) per year. The majority of this production has been exported to Ghana, Togo and Benin. The average net income per beneficiary was evaluated at 37,427 FCFA (\$62) in 1997/1998. This net income was estimated to 115, 398 FCFA (\$190) per beneficiary in 1999/2000. During the same period the net income for women was 130,000 FCFA (\$217) per beneficiary. Mr. Ouedrago is one of the Lelesge market garden beneficiaries. Mr. Ouedrago is head of a household with 9 persons. His rainfed cereal production is estimated at 500 kg per year during these last three years that can cover only 5 months his family cereal consumption. During the year 2002/2003 campaign, Mr. Ouedrago's net income from its 375 m² of market garden plot was

200,000 FCFA (\$333) in three months of activities. He spent 100,000 FCFA (\$166) to buy 700 kg of cereal for his household food consumption. The remaining income was used for children's school expenses and household members' health costs.

In Dogon Doutchi (Niger), where the seasonal exodus of men is very high, as food is so scarce they migrate to the cities in search of work, women use gardening activities as a food insecurity coping strategy. During the off-season women grow a mix of vegetable crops (onion, okra, tomato, eggplant), however the dominant gardening crop is cabbage (yield is about 25- 30Mt/ha). Part of the cabbage production is consumed during the off-season, the rest is dried and conserved for the hungry season. During the months of July and August when the price of food is very high, food insecure women will boil their dry cabbage leaves for household consumption, providing an important safety net for the families.

3. Objective

Evaluate the impact of woman gardening activities in Siguiri Prefecture

Specific objectives:

- 1) To evaluate the profitability of women gardening activities in Siguiri Prefecture,
- 2) To identify the production and marketing constraints that women are facing in gardening activities
- 3) To make recommendations for women gardening sustainability in Siguiri.

4. Methodology

Two sets of questionnaires were used to collect data: one administered to individual women, and another administered to a group of women. Eight women's groups (1 group per sub-prefecture) out of 28 were interviewed. In each group, 6 individual women were randomly selected so that a total of 48 women were interviewed. The project field agents administered the questionnaires. The first data compilation was done by the project M&E specialist using the Excel program. These data were imported into SPSS+ for statistical analysis. Simple frequency analyses were used to describe the beneficiary women and their gardening activities. The farm budgeting technique was used to evaluate the profitability of Siguiri women's gardening activities.

5. Findings

Organization of Siguiri women's gardening activities

In the Siguiri prefecture, PADRAS is promoting women's gardening activities in all its intervention villages through its micro-finance and agriculture components. The project's strategy is to support clients, mainly women, to undertake gardening. Women were organized groups (25-30 women per group). An elected management committee manages each woman's group. The management committee constitutes the link between

women beneficiaries and the PADRAS. The experience and quality of women who are managing these committees have a direct impact on the success of these women's enterprises. The management committees facilitate loan management (distribution, reimbursement, loan guarantee) and extension activities (crop demonstrations). In 2002, PADRAS provided \$36,080 to Siguiiri women's groups as loans for the purchase of improved seeds and small tools such as hoes. Part of the loans was also used for the construction of fences, digging of wells and for the payment for labor that women are unable to perform. The size of the individual loan was 100.000 FG (\$50) per woman beneficiary. The interest rate is 2% per month. Each individual loan is guaranteed by women's solidarity groups. Members of the same group work on the same piece of land. The average size of these lands is 1 hectare per group. Individual women, in most cases, have her own plot and plant the vegetables of her choice. In some cases, women are working collectively together on the same piece of land. The collective production is sold and the revenue is distributed among members. For individual plots, each individual woman is responsible for selling her own production.

These women organizations could serve the bases for the development of women activities (peanut or rice production, shea better processing) in Siguiiri. That requires from the project efforts of capacity building for these young women institutions.

Socio-economic characteristics of women participants

The socio demographic characteristics of women respondents reveal the average age of women participants is 40 years old. The majority of these women are married (92%), while 8% are considered widowed living with small children. Women respondents are illiterate (94%), and they cannot read or write even in their native language (adult literacy). This low literacy rate has implications on their participation in gardening activity management. In many cases women's groups refer to men to record their loans, to calculate the loan interests and payments etc.

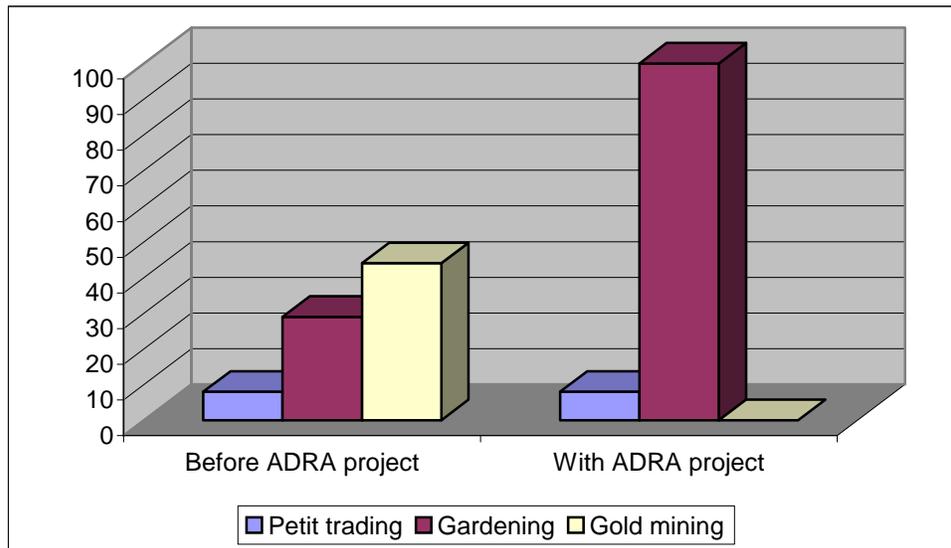
A mean of 6 children live with each woman, and there is an average of one under-five child per woman. The under-five children's mortality rate computed from the data collected is estimated at 249 per 1000. That seems to be too high. The under five children's mortality rate was 345 per 1000 in 1970 in Guinea. This rate was estimated at 172 per 1000 in 2000 (UNDP report). On average, each woman respondent has 2 children in school. Two students out of three in Siguiiri are boys.

Activities practiced by Siguiiri women

Economic activities practiced by Siguiiri women differ according to seasons. In the rainy season, agriculture is the main economic occupation of women. Beside their participation to household crop field activities, each woman owns some plots of land (1-2) for crop production. According to the survey results, peanut (83% of women said they cultivated them) and rice production (40%) are most important agricultural activities practiced by Siguiiri women during the rainy season. Total productions per woman for these crops are estimated at 10 sacs for paddy rice, and 6 sacs for peanut. In general, the productions

from these activities belong to women and are principally used for household consumption. In some sub-prefectures (Banko – 17%, Franwalia – 83%) shea nut collection constitutes another important source of income for women. These nuts are transformed into butter for household consumption or selling. The production of shea butter per woman in Suigiri was estimated at 48 kg per year. Before the PADRAS’ intervention, during the off-season (see Graph 1) interviewed women were busy with the artisanal gold mining (44%), vegetable gardening (25%), and the small trading (8%). With the project’s intervention, all women respondents are practicing gardening activities and have abandoned gold mining activities. This is a great achievement of the ADRA project in Suigiri that should be consolidated.

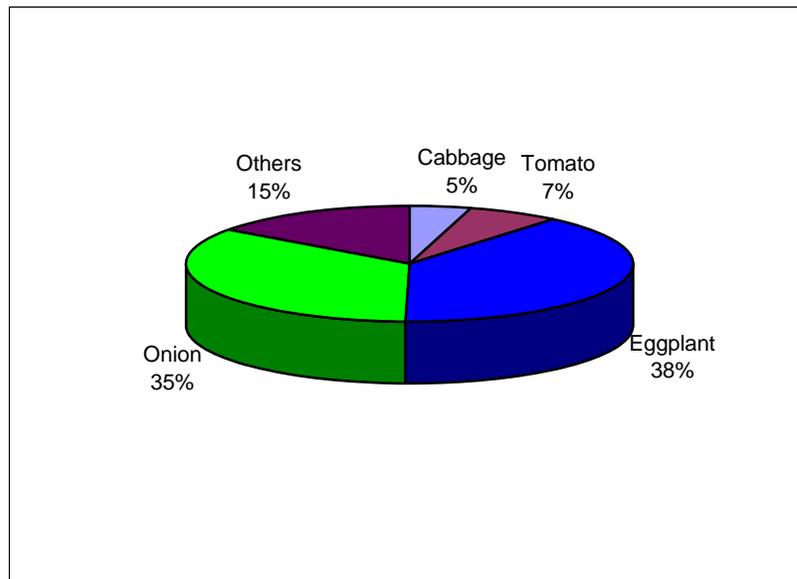
Graph 1: Off Season Activities Practiced by Gardening groups of Women



Woman gardening crop production system

Onion, tomato, traditional eggplant, okra, cabbage and lettuce are the main vegetable crops planted by Siguiiri women. The importance of each crop in the Siguiiri women’s gardening production system will depend on its profitability (market and price) and degree of risks (attack of insects, post harvest conservation). According to Graph 2, onion (35%) and eggplant (38%) are the two most important vegetable crops cultivated by women in Siguiiri. These are the two crops with less post harvest losses and can be considered as main cash crops. Tomato and cabbage are also grown in Siguiiri. The other vegetable crops include okra, potatoes, lettuce and pepper.

Graph 2: Importance of Vegetable Crops Produced



These vegetable gardens are manually irrigated from hand-dug wells (3-6 m depth) that limits the size of individual women's land plot. The average size of the individual plot of land is 250-300 m² per woman. The principal fertilizer used by women is organic manure (compost prepared by women). They are not authorized to use chemical fertilizer or pesticide. These restrictions affect the profitability, as one can see in the yield analysis section. For the moment the use of traditional methods of fighting against insects is not efficient. For some of the physical work, children and husbands helped women. For the 2002 campaign, each participant woman hired 2 workers (these young men are from the village or other villages) on average and spent 38,969 FG or \$20 for wage for four to six months of activities.

Profitability of Siguirí women gardening activities

Profitability is one of the conditions determining the sustainability of interventions in the agricultural sector. It is essential to induce farmers to make costly investments in physical infrastructure and to use fertilizer and manure. The purpose of this section is to estimate the financial return associated with the Siguirí women's gardening activities. Findings from this analysis will be used by the project field agents to advise women on how to improve the profitability of their activities.

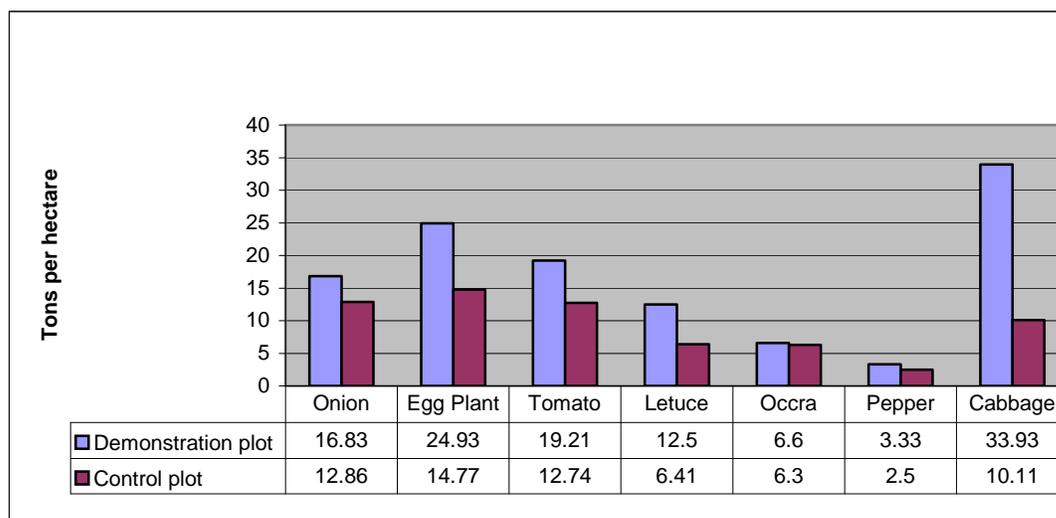
Profit is revenue less cost; in turn, revenue is output multiplied by price. To increase the farm profit a decision maker should examine the determinant of the profit components (output, crop price, input quality and price etc.). Given the lack of disaggregated data from this survey, the profitability analysis is based on outputs (yield, revenue, and expense costs analysis). The survey was retrospectively done and we were not able to collect the production data (individual plot yield, selling price). In the future, the evaluation data collection should be done during the production and commercialization period.

Yield data analysis

As one can see on the graph 3, yields from demonstration plots are above farm yields (using traditional techniques) for most crops. Even though this performance favors demonstration plots, for some crops the yield from demonstration plots is below the national or regional average farm yield, i.e. the average yield for onion (Texas variety - demonstration plot) in Siguiri is about 16.8 Mt/ha. In Guinea the average yield for the same onion variety is above 20-25 Mt/ha. For a FFP-supported OIC/Guinea project in the Mamou area, the average yield of onion recorded from farmer fields is 25 Mt/ha. For tomato, the demonstration plot yield is also below the national yield. For certain crops (okra, pepper, eggplant) there is no difference between the demonstration plot yield and control yield. Farmers are still using traditional variety of seed for these crops. This low yield can be explained by: (1) inexperience of many women in gardening activities, since they are at their first or second year of activity, (2) efficiency of local methods of plant protection, (3) lack of irrigation water at certain period of year, and (4) lack of close monitoring of women's gardens by the project field extension agents.

However, there is a huge possibility to increase the Siguiri women's gardening crop yield. This can be done through the introduction of improved variety of seed (Okra, pepper, eggplant) or to improve the actual production system, including better pest control (tomato, onion, eggplant). Collaboration with the Guinea's market vegetable gardening research center could help the project to control pests.

Graph 3: Gardening yield for FY 02



Source: ADRA/Guinea – FY 02 CSR4

Gross revenue

The average gross revenue per woman was computed from women beneficiaries' declaration concerning the total value of vegetable products sold during the 2002 off-season. This value doesn't include the value of products auto-consumed. The average

computed gross revenue is estimated at 275 000 F G (\$139) per woman in Siguiri (CV= 35%). This mean varies according to sub-prefectures. In Siguiri, urban commune or Maleah the average gross revenue per woman is between 350 000 FG (\$177) and 400 000 FG (\$202).

Expense Costs

The costs associated with these activities are input (seed, organic manure), hired labors and product transportation costs. These expense costs don't include the family labor remuneration.

In Siguiri, each woman participant is spending 96 776 FG (\$49) as total variable costs for gardening activities. Hired labor and product transportation costs are the most important expenses. They represent respectively 40% (38 969 FG) and 29.4% (28 533 FG) of the total expenses. The high transportation cost can be explained by Siguiri's bad roads. The only way for women to get to market with their products is by donkey cart. For some physical works (land preparation, digging wells etc), women are hiring men labors. Given the high cost of this labor, the project field agents should advise women to reduce the number of labor to be hired. The cost of seeds represents 17% (16 200 FG or 580 000 FG/ha - \$292/ha) that seems to be also high.

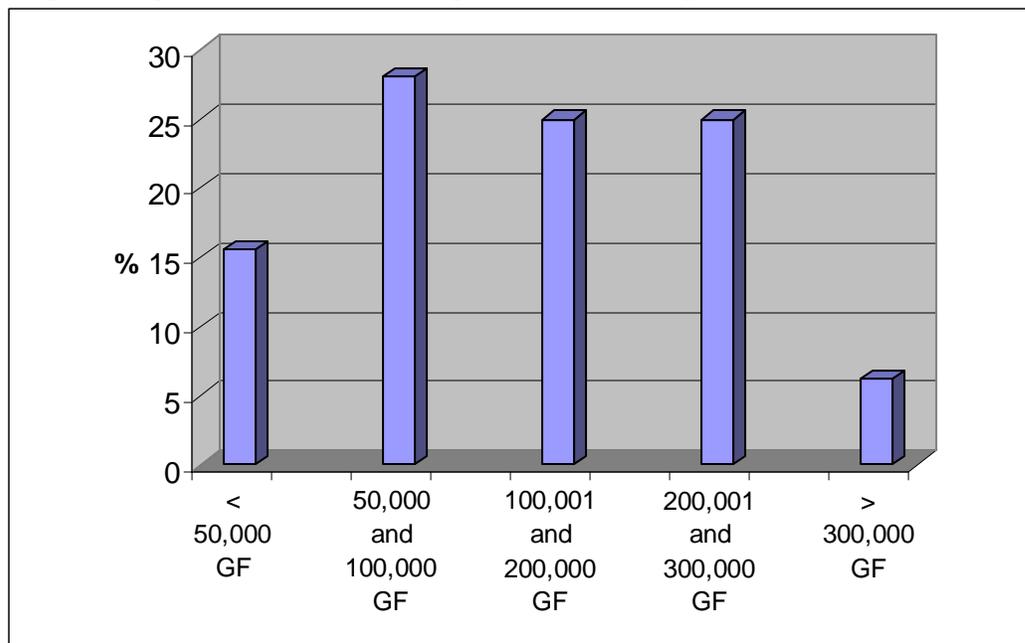
Performance indicators

Net Income

The net income is the total gross income per woman less total expenses (variable and fixed costs). The fixed cost concerns only the loan interest. We don't have information on the depreciation cost of equipment and infrastructure. The net income calculated should cover the depreciation expenses, remuneration of family labor (woman and family member who helped her).

The average net income computed is 162 404 FG (\$ 82) per woman participant in three months period. This result shows that Siguiri women's gardening activity is financially profitable. The average net income varies according to sub prefectures. It is 87 667 FG (\$44) in Banko against 246 400 G F or (\$124) for woman producers in the Urban commune. According to the graph below, close to half of Siguiri women gardeners obtained net incomes varying from 100 000 (\$50) to 300 000 GF (\$150) from 2002 gardening activities. Among these woman gardeners, 6% got more than 300 000 FG (\$150) on average as net income. Compared to woman gardening income from Burkina Faso, Siguiri women's gardening activity is more profitable. The average income per woman for gardening activity in zondoma is about \$ 50 that corresponds to 200 kg of cereal in Zondoma.

Graph 3: Repartition of Woman Respondents according to Net Income



The variable cost ratio is another indicator used here to evaluate the performance of Siguiiri women’s gardening activities. This indicator tells us what portion of the gross income is spent to pay the variable costs. In the Siguiiri case, on average, for each 100 FG of gross income, 35 FG was used to pay back the variable cost. This indicator varies according to the sub prefecture. In the urban commune, the variable cost ratio is 25% against 53% in Niagassola (the most isolated sub prefecture of Siguiiri). Based on this result one can affirm that off-season vegetable gardening is a profitable enterprise in Siguiiri. However, that should not hide the risk factors of this activity as women respondents pointed out in the production analysis. The risk factors relate to gardening in Siguiiri are: water availability, farm gate price variability for vegetable products, inefficiency of pest control and high post harvest loss. These factors will limit the sustainability of Siguiiri women’s gardening activities.

5. Production constrains

The following constraints were mentioned by women respondents as the most important factors affecting vegetable garden production in Siguiiri: Irrigation water, financial difficulties, access to input, difficult of selling products, post harvest losses.

Irrigation water: the lack of sufficient water for irrigation was presented by all women respondents as the most important production constraint. In Siguiiri, vegetable gardens are manually irrigated from wells (5-6 meters deep). During the months of March and April, these wells become dry so they can’t irrigate.

Financial difficulties: 75% of women mentioned the lack of financial resources as a constraint in vegetable crop production in Siguiiri. This problem exists at different levels. For 25% of women respondents, part of the loan received was used to buy food that

reduced their capacity to invest more in gardening. For others, the problem was that they have to pay interest on the loan before selling their products.

Input access: This constraint is related to financial difficulties in buying inputs. For the moment, the project supplied farmers with seeds.

Vegetable product market and post harvest loss: These two constraints are linked and concern almost all rural market garden products in West Africa. In fact, gardening activities occur in West Africa immediately after rainy season activities where the ground water table level is not too deep. The harvests of these market gardens happen in January – March and get into the market at the same time. The consequence is markets are saturated with vegetable products and prices become very low. Producers do not have appropriate technologies to conserve their production to sell at a later time. The Siguiri women's gardens are not exempt from these difficulties. In Siguiri, eggplant and onion are the most important market vegetable products (75% of garden land). Eggplant grown is a local variety adapted to local conditions. A certain number of villages have specialized in eggplant production. Production was sold to clients in the gardens (farm get). With the development of eggplant production in Siguiri (the project's intervention), the eggplant market moved from villages to the Siguiri market. Producers have to transport their production into Siguiri market involving high transport costs that reduce their profit margin. Onion production was introduced by NGOs. The variety grown is TEXAS with a very high yield. However, the conservation of this production is very difficult during the hot season. The post harvest loss rate can reach 50-100% of the total production. That explains the high variability of the onion price (100% of increase of onion market price three month after harvests).

6. Impact on household food security.

For the PADRAS project, “increasing the amount of disposable cash available to women will have the effect of increasing food access at the household level and maximize food utilize through enhanced household access to basic health and education”. These assumptions are correlated with our finding on the use of income generated from Siguiri women's gardens.

Buying food during the hungry season is the principal use of Siguiri women's gardening income
For more than half (52%) women interviewed, income from their gardens was used to buy food during the hungry season when on-farm food stocks were depleted. In Banko and Niagassola communes where women's generated income is low (more than 70% of woman has less than 100,000 FG) the project loan repayment was the priority of their gardening income use. However in the Maleah commune, where 83% of women have between 200 000 and 300 000 FG as gardening income, all woman respondents affirmed that the principal use of their income was buying food for household consumption during the hungry season. That means, in Siguiri, if women have income, the principal use is to increase the household's food access. Loan repayment was cited by 30% of women as their principal income use. For 19% of women the primary use of their income was buying the daily condiments for the household consumption. In the Siguiri urban commune where food insecurity is not acute, like in the other communes, women (100%) are mainly using their income for buying condiments.

According to the table below, women pay more attention to household food security if they have high income. For women with less than 100,000 FG as gardening income, have as a priority to pay back their loan (60% of women). However, for women with more than 100,000 FG, the principal use of their income is household food consumption (cereals and condiments). This finding suggests that the project should devote more resources and time for women's income generating activities in order to achieve its strategic objective.

Table: Repartition of woman respondent according to the primary use of gardening income

Income class	Buying food during hungry season		Daily condiment price		Loan repayment	
		%		%		%
< 50,000 FG		40.00				60.00
50,000 and 100,000 FG		33.33				66.67
100,001 and 200,000 FG		37.50	37.50			25.00
200,001 and 300,000 FG		62.50	37.50			
> 300,000 FG		50.00	50.00			
Total		52.08	18.75			29.17

The president of the Condeya village women gardening group is one of the ADRA clients in 2003. She said "I am a household head of 8 people including 5 children. My husband is sick. I am taking care of the household. In 2003, I received a loan of 100,000 FG (\$50) from ADRA to do gardening activities. After selling my vegetable products (70% of production total), my total gross income was 750, 000 FG (\$150). This income allowed me to reimburse my credit and buy 10 sacs of cereal (5 sacs of rice and 5 sacs of corn) for my household's food consumption. The remaining income was used to pay school expenses for my children and buy cloths, for my family. Thanks to ADRA"

Basic health and education of children are where Siguiri women are using their gardening income.

Per priority order, women cited buying medicine for children as the third highest expense category where they are spending their gardening income. However, for 19% of woman respondents buying medicine is the second highest expense category for gardening income use. For some women, part of their gardening income was used to pay children's school expenses.

Directly or indirectly, the Siguiri women's gardening activity has contributed to development of the local economy and household food security.

The Siguiri women's gardening groups have contributed to maintaining youths in the villages. During 2002, women gardeners mobilized 1500 young men for gardening activities. They paid to these young men 31 million FG (\$15,686) as salary. More than half of this amount was used to buy food for these young men's families. For transportation of the production from villages to markets, women have mainly used donkey carts that belong to

other villagers. On average each woman paid 28,500 FG for transportation costs. The Siguiiri women's gardening activities' total contribution to the local economy (transportation costs) in 2002 was estimated at 22.7 million FG (\$11,472).

For a total investment of \$36,080 (loan) in 2002, the Siguiiri women's groups paid back their total loan, and distributed to woman participants a total of \$ 65,372 as net profit from their gardening activities. The Siguiiri women's groups contribution the local economy (salaries and transportation cost) was estimated at \$ 27,150. The loan interest paid in 2002 is estimated at \$ 6,385.

7 Conclusions/Recommendations

In two years of activity, PADRAS has supported 1,643 individual gardeners (1416 women and 227 men) comprising 55 women's associations in 8 sub-prefectures of the Siguiiri prefecture. The present study has concerned 48 randomly selected women from 8 women's groups in the Siguiiri prefecture. The study's findings reveal that women's gardening is a profitable enterprise in the Siguiiri prefecture. The net income per woman participant varied from 87,000 FG to 246 000 FG according to communes. The average net income was estimated at 162 000 FG per women. This average should not mask a group of women who are not making much profit from these gardening activities. The study found that for 15% of participant women, net profit is below or equal to 50,000 FG (\$25). The profitability of women's gardening activities in the Siguiiri prefecture is highly associated with irrigation, water availability and a good economic environment (existence of a market, good road, good input credit system etc.). The success of the Siguiiri women's gardening activity is linked in part to the Siguiiri women's group organization and the PADRAS's financial support (micro-finance program) to this activity.

Even though the gardens are basically successful, since their beginning two years ago, the Siguiiri women gardeners are facing some constraints that limit the development of gardening activities in the Siguiiri zone. Followings are some of these constraints:

- Availability of irrigation water
- Lack of appropriate technology of pest control
- Bad roads in the Siguiiri prefecture
- Lack of adequate post harvest technologies for vegetables products
- Insufficiency of vegetable markets.

All these factors are affecting the Siguiiri women' garden crop yields and gardeners' profit.

Recommendations

- 1 Given the constraints identified for the development of gardening activities in Siguiiri, PADRAS should start a market study for Siguiiri's vegetable products. The results of this study should be integrated into a general development program of women's gardening activities in Siguiiri.**

- 2 **PADRAS should look for the development of other woman's agriculture income generating or production activities in Siguiiri – i.e development of peanut and rice production/processing shea better processing.**
- 3 **The general development plan of Siguiiri women's gardening activities should consider the social responsibilities of women. For that, PADRAS should work on how to reduce women's daily work – i.e promotion of cereal/shea nut milling machines, loan for transportation means for woman's groups etc..**
- 4 **Given that the Siguri women gardeners are married women and have on average one under-five child, PADRAS should reinforce the synergy between its activities and the USAID funded nutrition program in Siguiiri.**
- 5 **For the sustainability of these gardening activities, PADRAS should find alternative least cost technologies for irrigation. Drip irrigation might be a possible solution, and the FFP project's experience in Cape Verde can be a case study for PADRAS.**
- 6 **Post harvest losses and pest attacks have been mentioned by women gardeners as a major constraint for gardening activity development in Siguiiri. PADRAS should work with the Guinea agricultural research centers to find appropriate solutions.**
- 7 **Lessons learned from Siguiiri women's gardening activities have revealed that women's income in food insecure zones is principally used for food household security (buying food for household consumption, cost of medicine, children's school expenses). The implication of this finding is that more resources should be committed to women's production and income generating activity development.**
- 8 **PADRAS' micro-finance component should capitalize these findings and models its loan distribution to women in function of their reimbursement capacity. Woman's groups should be encouraged for more saving to support PADRAS' micro-finance activities.**
- 9 **In the future, the project should monitor a sample of women for economic studies (yields, production, input/output prices, production costs etc.) of women's gardening activities in Siguiiri.**

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