

Evaluation of Farmers in Reforestation of Degraded Reserve : A Case Study of Kyekyewere Community in a Transitional Zone of Ghana

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Summary : Since the initiation of the modified taungya system (MTS) projects in 2001 in Ghana towards improving farmers' socio-economic conditions, forest protection and forestry development, studies relating to projects' impacts, and farmers' incentives to participate in the project are limited in scale. The study therefore explores the farmer's participation rate and driving-force for participation in the project. It further assesses the project's impacts on farmers' land acquisition mode, shifting cultivation and income. The respondents are comprised of randomly selected taungya farmers in the Kyekyewere community, a forest-fringe village of the degraded Afram Headwaters Forest Reserve in the Offinso Forest District of the Ashanti region, Ghana. Semi-structured questionnaire, key informant interviews and focus group discussions were the methods employed for primary data collection.

The results revealed a strong correlation between landownership status and farmer's incentive to participate in the project. Again from the results, the MTS project seems more beneficial to the landless farmers and therefore much more effective than among land owners. Furthermore, as a result of the project, shifting cultivation practice is being abandoned and more land is being allowed to fallow, a situation which is good for forest protection and conservation. Finally, farmers participating in the project could realize some returns which would improve their livelihoods.

Key words : Ghana, Kyekyewere, Degraded forest reserve, Farmer participation, Taungya farmer

1. Introduction

Ghana has a land area of 238,500 km². Degradation of tropical forest resources is assuming alarming proportions throughout the tropics and Ghana is no exception. In Ghana, all naturally occurring trees are symbolically owned by the traditional authorities, who hold the resources on behalf of the people, but the management, harvest and sale of timber resources rest with the government (DADEBO and SHINOHARA, 1999). In the 1920s and 1930s, 280 forest reserves in Ghana were demarcated and placed under the management of the Forestry Department for the purpose of ensuring the sustainable use of Ghana's forest resources and the preservation of forests with important roles as watersheds and wind-breaks. Since this time, Ghana has lost roughly 80% of

its forest habitat (CLEAVER, 1992) and about one-third of Ghana's forest is estimated to have disappeared in the 17 years between 1955 and 1972 (HALL, 1987). Of the original forest zone covering 82,260 km², the area under forest in 1973 amounted to 20,530 km² including 16,790 km² within forest reserves distributed throughout the forest zone (ANON, 1973). In 1988, forest cover in Ghana was estimated to be around 15,842 km² with the annual deforestation rate estimated at 220 km² (SAYER *et al.*, 1992). It is estimated that the area of forest land left is about 1.6 million, ha most of which are within government gazetted lands (forest reserves). The major factors responsible for deforestation and degradation in Ghana include farmland development (shifting cultivation practice), timber production (legal and illegal logging), infrastructural development, fuel wood collection, min-

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ing and forest fires. Other factors that seem to have worsened the situation are high population growth (about 2.1%), poverty as well as past management practices (COBBINAH *et al.*, 2001).

The government of Ghana is committed to the restoration of degraded forests. It is a key component of Ghana's 1994 forest and wildlife policy, 1996–2020 Forest Development Master Plan as well as other related sector policies including the Ghana Poverty Reduction Strategy (GPRS) paper (ABENEY *et al.*, 2008). To address the continued deterioration of the forest, and land scarcity facing forest-fringe communities the government in 2001 officially launched the National Forest Plantation Development Programme in which the “modified *taungya* system” (MTS) is one of the plantation development strategies.

Plantation development using the *taungya* system in Ghana could be dated back to the early 1920's when the government of Ghana launched a small scale plantation development programme (AGYEMAN *et al.*, 2003). Then, in the 1970's the government initiated a large-scale plantation development project, again using the *taungya* system. However, due to administrative, social and economic problems, these programmes were abandoned (AGYEMAN *et al.*, 2003). Despite these problems, forest-fringe communities still view the *taungya* system as one of the most beneficial forest tenure systems and requested the government to re-introduce it, albeit with changes (AGYEMAN *et al.*, 2003). The re-introduction of the *taungya* system i.e. MTS seems to have given hope once again to forest-fringe communities, as they will have access to land for agricultural activities and further change their socioeconomic conditions.

The MTS involves the establishment of plantations by the Forest Services Division (FSD) in partnership with peasant farmers from forest-fringe communities. The Plantations Department of FSD of the Forestry Commission (FC) is responsible for the implementation, coordination and management of MTS. The FSD provides technical direction, surveys and demarcates degraded forest reserve lands and supplies pegs and tree seedlings while the farmers provide all the labour inputs in the form of site clearing, pegging, planting, maintenance and fire protection. The farmers are permitted to cultivate their food crops which are inter-planted with the tree crops on the same piece of land until the tree canopy closes, usually after 2 years. The farmers, in addition to the food crops they harvest, have a 40% share in the returns from the matured trees. The FC also has a 40% share while the landowner and community will have a 15% and 5% share respectively (Forestry Commission, 2007).

The evaluation of the project focusing on the farmer participation rate, the incentives to participate, and the impact of the project on the socio-economic environment of farmers, are important for the estimation of the projects' successes and/or failures and also to find out if the projects' goals have been met (ABDULLAH *et al.*, 2007 ; ARNOLD, 2001 ; ALIM, 1988). This will also provide information to decision makers and stakeholders, as well as guide them in future decisions concerning the project (ZAMAN and MASATO, 2009 ; NOOCHDUMRONG *et al.*, 2006). Since the MTS project's inception, studies relating to the projects' impacts, and farmers' incentives to participate in the project have been limited in scale. Literature review of studies on MTS focuses more on biological and production aspects. The study therefore explores the impacts of the project on farmers' land acquisition mode and shifting cultivation and income. It further assesses the driving-force for project participation by farmers.

2. Methodology

2.1 Study Area and Data Collection Method

The study was carried out in Kyekyewere village, a community situated in the Offinso Forest District in the Ashanti region of Ghana. It is a forest-fringe community around the Afram Headwaters Forest Reserve ($1^{\circ}32'W-1^{\circ}48'W$ and $6^{\circ}45'N-7^{\circ}25'N$), a 20,100 ha target reserve for restoration located in the transitional zone (OPOKU and SATO, 2009) of Ghana. The study survey was conducted between 22/07/2009 and 25/08/2009. The criteria for the selection of this village were based on the size of the village, farmer's participation rate, time and resources availability and accessibility. A total of 63 farmers (42% of average *taungya* farmers) were randomly interviewed using closed-ended as well as open-ended questions. *Taungya* farmers were selected because they understood the *taungya* system and it was also much easier for them to have an image about crop benefit evaluation under the system.

Key informant interviews as well as focus group discussions also formed part of the information elicitation process. Field visits were undertaken to observe farming practices on farms. Secondary data were also collected from the FSD, Forestry Research Institute of Ghana (FORIG), District Assembly and the Ministry of Food and Agriculture (MOFA). The data were analyzed using both descriptive and inferential statistics.

The main hypothesis is that the incentives to participate in the project vary according to the farmland status of the farmers involved. The basis for this hypothesis is due to land hunger as well as land tenure arrangement forms within this community. According

to AGYEMENG *et al*, 2003, in land-hungry areas, access to degraded forest land for crop production is the single most important involvement and benefit that most farmers are looking for.

3. Results and Discussions

3.1 General Information of the Interviewed Respondents

Table 1 shows the background information of the

Table 1 Background Information of Surveyed Respondents

Characteristic	# of Respondent	Percentage
Sex		
Male	37	59
Female	26	41
Age		
18-36	10	16
37-58	42	67
>58	11	17
Education		
Illiterate	18	29
Non-formal	1	1.5
Basic	39	62
Secondary	4	6
Tertiary	1	1.5
Household size		
1-5	19	30
6-10	37	59
>10	7	11
Religion		
Christianity	57	91
Islam	1	1.5
Traditional	1	1.5
None	4	6
Occupation		
Farming	57	91
Trading	4	6
Others*	2	3

*public servant, weaver, security work etc

Kyekyewere's 63 interviewed respondents.

From this table and considering the age class categories 18–35 and 36–53, as the productive age and majority of the respondents (83%) falling in them implies that production (both crops and trees) from the project is likely to increase, and this increase will reflect in the lives of the farmers.

3.2 Farmer Participation and Forest Area Allocation

Figure 1 shows the changes in general farmers' participation as well as land area allocation since the start of the project. Except for the year 2004, plot allocation is done annually. In 2004 farmers were asked to work on previous plots and thus no new farmers were admitted into the project. The fluctuations in the farmers' participation according to the plantation project managers and supervisors as well as taungya heads, could be attributed to the following reasons : ① migration of farmers to urban areas to seek off-farm opportunities, ② refusal of new plots to old farmers of the project with poor plantation establishment on previously allocated farms, ③ admittance of very few new and committed members, ④ insistence of project members to focus attention on previously allocated farms instead of new ones, ⑤ reluctance of farmers to take up new plots due to location far from their homes, making farming inefficient.

The kinds of driving force for participation in the project were also elicited from the respondents and the information is captured in Table 2. The items selected were based on the projects' goals and the farmers' needs.

From Table 2, there is a significant correlation between landownership status and participation incentive. A total of 15 farmers [landless 12 (80%) and landowners 3 (20%)] mentioned AL only as the motivation to partake in the project. Again, more than 71% of all those who cited access to land and tree benefits as motivation factors were landless. On the other hand, out of the 13 farmers who indicated TB only as the motivation factor 8 (62%) were landowners and for the total of 10 farmers who mentioned TB & FFL, 7 (70%) were landowners. Based on the opinions of the projects' supervisors which were also confirmed during field observations, the implication for the project is that, although both groups care about tree benefits which is an important goal of the project, and are likely to ensure successful plantation establishment, however as the landless group places more importance on land, the lack of which would curtail their livelihoods, they stand a better chance to successfully and sustainably manage the project for their livelihood. Again, since

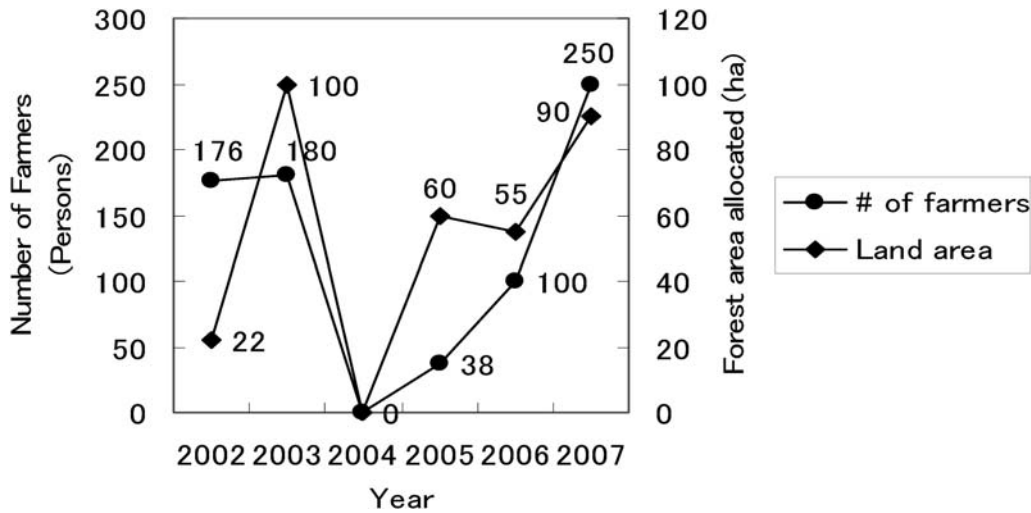


Fig. 1 Changes in the Number of Farmers and Forest Area Allocation
Data source : District Forest Office, Offinso

Table 2 Incentives to Participate in the Project against Farmer's Landownership Status

Participation incentive	Landownership Status		Total
	Landless	Landowner	
AL only	12	3	15
TB only	5	8	13
FFL only	1	3	4
AL & TB	15	6	21
TB & FFL	3	7	10
Total	36	27	63

(Note: AL = Access to Land, TB = Tree Benefit and FFL = Fertile Forest Land), $\chi^2 = 11.498$, $DF = 4$, P -value = 0.05,

Source: Field survey, 2009

the majority of the land owners have much interest in the fertility of the soil, it leads to the question of whether or not they will exploit the system to achieve their immediate goal of good crop returns.

3.3 Impacts of the Project

3.3.1 Impact on Land Acquisition Mode and Shifting Cultivation

The most common way for landless in a community to obtain farmland is to become sharecroppers or land renters, and normally have restricted rights to the use of acquired land. Tenure arrangements sometimes lead to disputes on land and farm produce. Tenants and migrants have restrictions related to the acquired land. The landlord may demand the land back at any time if they misbehave, or if the landlord needs the land for a member of his own family (AGYEMAN, 1994).

The impact of MTS project on mode of land acquisition in the community was assessed by comparing the farmers' situations in relation to farm land access before and after the project (Table 3). The land owner in this context refers to farmers who have usufruct rights equivalent to a freehold to the use of land even without the consent of trustees, unlike sharecroppers who must share crop returns with the land owner or land renting farmers who must pay an agreed amount of money to the land owner. In the case of land owner, the land may be a stool land (i.e. land vested in appropriate stool on behalf of the community represented by the chief), family land (i.e. land vested in family represented by family head) or privately owned property. With the stool and family lands, as the member size increases, there is increased competition for fertile areas and accessible area whilst the fallow period decreases.

Table 3 Land Acquisition Mode Before and After MTS

	Before MTS				After MTS				Changes	
	HH	TA	Min	Max	HH	TA	Min	Max	HH	TA
Landowner	28	-	-	-	28	-	-	-	0	-
Sharecropper	30	73	0.5	5	4	8	1	3	-26	-65
Land renting	5	9	1	3	1	3	3	3	-4	-6
Taungya plot	0	0	0	0	63	307	0.5	5	63	307

(Note: MTS = Modified taungya system, HH = Household, TA= Total area, Min = minimum area, Max = maximum area /acre)

Table 4 Average Taungya Farm Establishment Cost Per Acre of Teak Mixed with Food Crops (Maize, Plantain & Cocoyam)

Year	Item	# of times	Man-days	Quantity	Cost	Remarks
2009	Labour for:					
	Land preparation	1	10	10	25	Ave. rate Gh¢2.5/man-day
	Pegging	1	4	4	10	
	Planting	1	4	4	10	
	Weeding	3	4	12	30	
	Harvesting	2	2	4	10	
	Transportation	2	3	6	15	
	Planting Material:					
	Maize			3kg	2	
	Plantain			-	3	
	Cocoyam			-	2	
	Total A				107/acre	

Table 5 Income from major crops (Major crop benefits)

Crop	Ave. Quantity	Average rate	Amount
Maize	4 sacks	Gh¢45/sack	180
Plantain	10 suckers	Gh¢10/sucker	100
Cocoyam	6.5 sacks	Gh¢9/sack	58.5
Total B			338.5
Net Benefit	Total B – Total A		231.5

(Note: the net benefit as computed excludes the amount consumed at household level as well as benefits from minor crops)

From Table 3, following the project 30 farmers with a total farm area of 71 acres are no more under land arrangements (sharecropping & land renting) and their land becomes fallow land. Since over 80% of the farmers were engaged in shifting cultivation practice outside the forest reserve, the project is contributing to ending shifting cultivation—a major cause of deforestation in Ghana—with the return of large tracts of land under fallow. This would reduce the population pressure on lands under cultivation by other farmers outside the project area and further widen the fallow period from the current 1–3 years. This situation would lead to reduced soil degradation, increased per hectare crop yield and reduce the incidence of poverty. Again, the table shows that an equivalence of 307 acres of forest land has been allocated to 63 farmers since 2002 under the taungya system. As a result of this, the problem of land scarcity facing farmers in this community has been addressed to some extent and farmers are accessing a resource which will impact greatly on their livelihood.

3.3.2 Impact on income (The economic inputs and outputs of crops)

The impact of the project on farmers' income was assessed by comparing the average taungya farm establishment cost which includes labour cost (for site preparation, pegging, weeding etc) and planting material cost with the returns from major crops (Maize, Plantain and Cocoyam) in the first year. Table 4 shows the average taungya farm establishment cost borne by the farmer per acre in the first year which is Gh¢ 107 and Table 5 sums up the total returns from the major crops in the first year as Gh¢ 338.5. Thus the net benefit to the farmer in the first year is calculated to be Gh¢ 231.5/acre/year as shown in Table 5. It must be mentioned that the above scenario represents the case of a farmer with one plot. The annual income situation for farmers receiving plots yearly is different from those with only one plot. For farmers having many plots, income in the second year is higher than the first year and so on. This is so because in the second year the returns will come from two plots i.e. the current and previous plot. For a farmer with three plots, income will come from three sources i.e. 1st plot, 2nd plot and current plot. Thus, farmers with many plots tend to obtain higher returns.

4. Conclusions and Recommendations

The modified taungya system, which began in this community in 2002, has benefited the participating farmers. Prior to the project landless farmers indicated that the major drive to participate in the project is

mainly land access and tree benefit, whereas land owners incentives for joining the project are mainly fertility of forest soils and tree benefit. Following the project, farm land arrangements are becoming a thing of the past and shifting cultivation practice, a major cause of deforestation, is being abandoned by farmers. Farmers' income levels have increased and hence there has been a reduction in poverty to some extent. This finding is supported by ABDULLAH *et al.* (2007), whose results showed that the lifestyles of respondents were affected by the project and the incomes of participating respondents increased substantially more than that of non-participating respondents which, in turn, had a positive influence on their living standards. Again, ARNOLD (2001) also asserted that people-oriented forest management has been contributing to improvement of forest conditions, as well as improving social status and increasing recognition for the rural poor in many developing countries.

The effective monitoring by plantation supervisors is a key to the sustainability of the project as it would reduce project abuse by farmers. Again, the direct inclusion of traditional authorities will enhance the project's success. Finally, if possible, some fund or loans should be made available to farmers for land preparation and other initial costs for the project.

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荒廃保護地における農民の造林活動とその評価

—ガーナ移行地帯のチェチェウエレ地域を事例として—

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要約：ガーナでは 2001 年以降、農民の社会経済状況の向上、森林保護、そして林業開発を目的として改良タウンヤ方式 (MTS) による造林プロジェクトが実施されてきたが、プロジェクトによる住民へのインパクトや農民参加の動機についての研究は限られた範囲内において行われているに過ぎない。そこで本研究では、農民のプロジェクトへの参加割合と参加動機について明らかにすることにした。具体的には、本プロジェクトのインパクトを農民の土地取得方法、移動農耕の実施、そして現金収入の状況において評価した。ガーナ国アシャンティ地区、オフィンソ森林保護区内、アフラム水源涵養地区における森林周辺村であるチェチェウエレおよびその住民を対象とした。調査は、住民に対するアンケート調査、重要人物への面接や住民内のグループディスカッションを基本データとした。分析の結果、農民の土地所有状況とプロジェクトへの参加意識について強い相関関係が認められた。また、改良タウンヤ方式によるプロジェクトが土地あり農民よりも土地なし農民により有益であったことも明らかになった。さらに、プロジェクトを実施することにより移動農耕の実施が少なくなり、より多くの休耕期間が設けられるようになり、森林保護と保全に良好な方向へと展開してきている。最終的には、プロジェクトへの農民参加が住民自身の様々な利益へとつながり、生活状態も向上することが可能であることがわかった。

キーワード：ガーナ、チェチェウエレ、荒廃した森林保護地、農民参加、タウンヤ農家

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