

PERCEPTION AND PARTICIPATION OF LOCAL COMMUNITIES IN TREE PLANTING INITIATIVES IN NORTHERN GHANA

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ABSTRACT

In the last three decades, tree planting and tree resource conservation have been promoted in Northern Ghana in response to forest and land degradation. This study assessed local communities perception and factors influencing participation in tree planting programmes in Northern Ghana, focusing on Ghana government initiatives executed between the period of 1980 to 1995. These initiatives comprised protection of communal forests, management of natural regeneration and tree planting in agroforestry systems. Data was collected through structured questionnaire from 1000 respondents in selected communities in the Northern, Upper East and Upper West Regions of the country and analyzed descriptively. The results indicate that communities perceived tree planting as fairly important social programme with 74% of respondents advocating for it. Free supply of seedlings, provision of food aid and free inputs supply were the dominant motivating factors influencing participation in the planting programme. Poor extension services and lack of strong efficient organization were the major constraints affecting people's participation. Institutional capacity building in support of extension services at the community level is a prerequisite for effective and sustainable plantation development programme.

Keywords: participation, perceptions, tree planting, constraints to tree planting

INTRODUCTION

The future of drylands forests depends upon the extent to which local people are facilitated to participate actively in the utilization and conservation of its natural resources. Tree based strategies to adapt to drought and prevent land degradation need to also meet the expressed food security and income generation needs of the people in this area (Jama *et al.*, 2003). Northern Ghana is characterized by savanna open woodland vegetation within the drylands of the semi-arid

zone of West Africa. The area has the highest population growth rate (3.4 per annum) in the country. This is compelling a progressively greater number of people to depend on the limited quantity of forest and land resources for their livelihood. Thus a number of communities are unable to meet their needs for forest-based goods and services. For instance in many areas of northern Ghana and elsewhere, women aggressively pursue the opportunity to store and generate cash income through the collection of shea nuts and most commonly, the very poor household primarily female-headed ones often

resort to the collection of firewood when food get scarce at the end of the dry season (Laube, 2007). The extraction and utilization of fire wood and charcoal has therefore become a major driver of forests degradation in these areas. In some cases, agricultural waste and cattle dung, which have relatively low energy outputs, are used for fuel.

Generally, protection and utilization of land and natural resource management has been a challenge in Northern Ghana. The rate of deforestation due to cutting and perennial fires in the region (estimated by the Forest Services Division of the Forestry Commission to be about 1.7% per annum.) is far ahead of the Forest Service's reforestation efforts. For years, several measures have been undertaken towards promoting a sound management of the environment and its natural resources. Sharma and Pal (2001) points out that any attempt in reducing degradation of natural resources requires the use of combinations of conservation, protection and production interventions.

In an effort to ensure wood supply to communities and reduce pressure on the natural woodlands, the Government of Ghana launched a tree planting programme in Northern Ghana in 1982. The programme aimed at increasing the stock of trees on farms to reduce pressure on natural woodlands, thereby enhancing natural regeneration while improving access to wood and wood products which are difficult to obtain in the wood deficit areas of this region. The programme encouraged both rural and urban communities to plant more trees and collaborate in natural forest management in order to reduce pressure on the natural woodlands and ensure biodiversity conservation. Three different forms of tree planting, namely amenity planting, agroforestry and woodlots are practiced in Northern Ghana. Amenity planting is usually done within and around family compounds and villages. Forms of agroforestry include

boundary planting, dispersed trees among food crops and alley farming. Woodlots are established mainly on lands that are not being used for the cultivation of food crops. These land include excess land in low population density areas e.g. Northern and Upper West Regions and marginal lands (rocky or exhausted soils) which are generally unsuitable for crop production in high population density areas e.g. Upper East Region.

Under the national plantation programme, woodlots and agroforestry systems were to be established to supply forest based goods and services to improve rural livelihood and ensure reforestation of degraded landscapes. The programme was later expanded to include management of natural woodlands and biodiversity conservation. In the case of the tree planting programme, agroforestry systems and monocultures involving *Tectona grandis* and *Senna siamea* were introduced. These species were the most popular tree crops which were being planted among farmers in the study area. *T. grandis* is one of the most important exotic timber tree species in Ghana. It is used as transmission poles for rural electrification programmes and raw materials for small scale domestic processing. It is also exported in round log form to other countries and *S. siamea* is mostly used as fuelwood.

Despite the active involvement of government, NGOs and the local communities in implementing tree planting programmes, very little is known about the activities and outcomes of the program on the people and the environment in the area. A study was designed to undertake an ex-post evaluation of the program. This paper reports on the key findings of the evaluation. It is focused on the assessment of community perceptions and participation of the tree planting programmes and its implications as a tree conservation strategy in farming systems in Northern Ghana. Factors

critical to the success of tree planting programmes in Northern Ghana have also been identified.

METHODOLOGY

Study Sites and Sample Selection

Northern Ghana covers about 57% (approx. 135,600 km²) of the land area of the country, which is approximately 238,000 km². Northern Ghana is divided into three administrative regions, namely; Upper East Region (UER), Upper West Region (UWR) and Northern Region (NR). The dry season in this part of the country is between 5-6 months with the annual rainfall ranging between 900 and 1200 mm. The relatively long dry season, low annual rainfall and strong dry harmattan winds make this area more prone to fire compared to other parts of the country. The vegetation is composed of short branching and widely scattered trees usually less than 15 m high. Common trees in this vegetation zone are fire-resistant trees (Siaw, 1998; MES, 2002) which are protected and of economic value (Baker, 1962). Some of the common trees are *Vitex parviflora*, *Parkia clappertoniana*, *Ceiba pentandra* and *Acacia albida*.

The population densities range widely with 87.3 persons km² in UER, 23.8 persons km² in Upper West Region (UWR) and 16.5 persons km² in Northern Region (NR). A significant feature of the population in Northern Ghana is the relatively high degree of poverty and illiteracy. It is estimated that over 56% of the total number of people living below the poverty line in the country are found in Northern Ghana (IMF and World Bank, 2005).

The study area (i.e. Northern Ghana) was stratified into four areas due to the differences in socio-cultural conditions, population densities and agricultural practices. The sites are Upper West

Region (UWR), Upper East Region (UER) and the Northern Region (Figure 1). The Northern Region was subdivided into two, namely, areas occupied by the Dagomba and Mamprusi tribes (Tamale areas (Northern Zone A (NA)) and those of the Gongga and Vagla tribes (Damongo areas (Northern Zone B (NB))). The sub-division of Northern Ghana was made because of its relatively large area, socio-cultural and economic differences. A total of 80 villages/communities were surveyed for the entire study comprising 20 villages/communities in each of the 4 stratified study areas (UWR, UER, NA and NB).

Data Collection and Analysis

Data collection was conducted from June 1998 to August 1998.

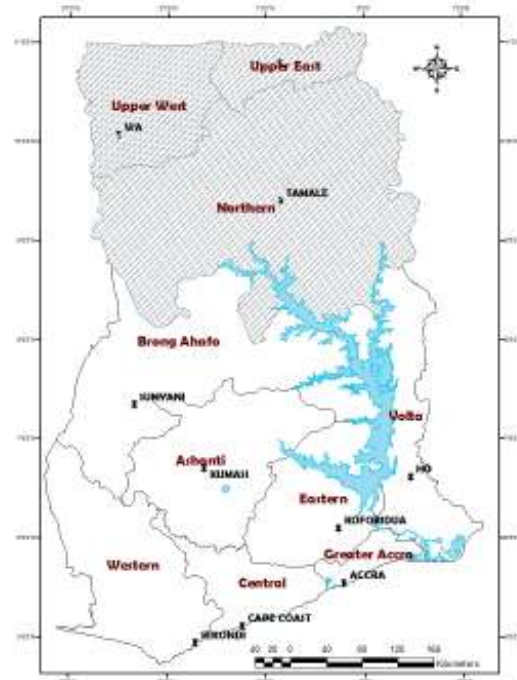


Figure 1: Map of Ghana showing study areas (shaded)

A reconnaissance visit was first made for an overview of the study area; provide background information for designing the questionnaire for quantitative data collection and to establish rapport with contact persons to facilitate the execution of the main survey. This was then followed with structured questionnaire administration and unstructured interviews involving communities and organizations in the eighty selected villages and communities. A total of 1000 questionnaires were administered. In each community, data was collected on perceptions of the performance of tree planting and community forest conservation projects executed. The perceived importance of these projects in relation to other social projects was also evaluated. Information gathered through the use of questionnaires was analyzed descriptively.

RESULTS

Demographic Profile of Respondents

Over 85% of the respondents interviewed were men (Figure 2). Women were few probably due to

the usual male dominance in Ghanaian families, restrictive land holdings and lower economic status among women. The majority of respondents were between the ages of 20-50 years (Table 1). Over 88% of respondents were married. This is probably because most of the people surveyed were family heads. Traditional African worship and Christianity were the most important religions in the Upper East and the Upper West Regions. However, Muslims dominated in the Northern Region.

Species Choice/Preferences

Under the tree planting programme, permanent and temporary nurseries were established to provide planting stock for the programme. Tree species produced from the nurseries were mainly *Azadirachta indica* (neem), *Tectona grandis* (Teak), *Senna siamea* (Cassia), *Leucaena leucocephala*, *Eucalyptus spp.*, *Gmelina arborea*, *Albizia spp.* and *Khaya senegalensis*.

Table 1: Percentage of respondents in different age categories in the Upper East (UER), Upper West (UWR), Northern Zone A (NA) and Northern Zone B (NB) regions

Age category (years)	Percentage of respondents in study sites			
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B
<21	4.4	4.6	6.5	6.1
21-30	26.1	18.3	20.3	19.3
31-40	27.4	23.3	29.3	25.9
41-50	22.6	25.0	22.4	23.9
51-60	14.6	14.6	13.8	12.2
>60	4.9	14.2	7.8	12.7
Total	100.0	100.0	100.0	100.0

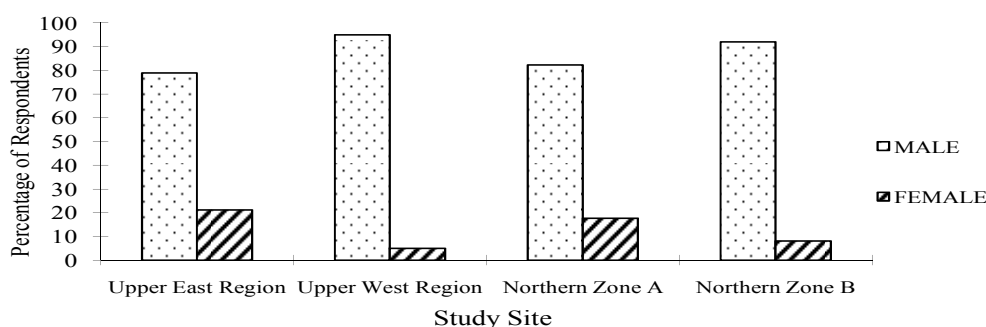


Figure 2: Percentage of male and female respondents in the Upper East Region (UER), Upper West Region (UWR) and Northern Region (Northern Zone A and Northern Zone B) of Ghana

Fruit trees also included guava, and grafted mangoes. Although the majority of trees planted under the programme were exotic species and therefore do not enhance biodiversity, it sought to address issues of acute fuel deficit, improvement of tree resources in large deforested areas and the promotion of community based tree planting. Majority of seedlings planted were supplied free to

farmers by the Forest Services Division (FSD) of the Forestry Commission (Table 2). The availability of seedlings (46%) followed by individual needs (32%) are the most important factors influencing choice of tree species planted (Table 3).

Table 2: Source of seedlings for planting by farmers

Seedling source	Percentage of respondents in study sites				Overall Percentage
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Purchased	3.5	5.8	42.9	19.8	19.0
Free supply by FSD	45.1	86.8	17.0	72.9	56.0
Raised by community	35.4	0.8	9.8	-	12.0
Others	6.6	6.6	30.3	7.3	13.0
Total	100	100	100	100	100

Table 3: Reason for choice of species by respondents in the various study areas

Species choice reason	Percentage of respondents in study sites				Overall %
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Availability	37.2	38.0	31.3	70.8	44.2
Supplied by FSD.	38.9	5.8	5.4	12.5	15.7
Need	22.1	48.8	43.8	10.4	31.3
Others	1.8	7.4	19.5	6.3	8.8
Total (%)	100	100	100	100	100

* FSD is the Forest Services Division of the Forestry Commission

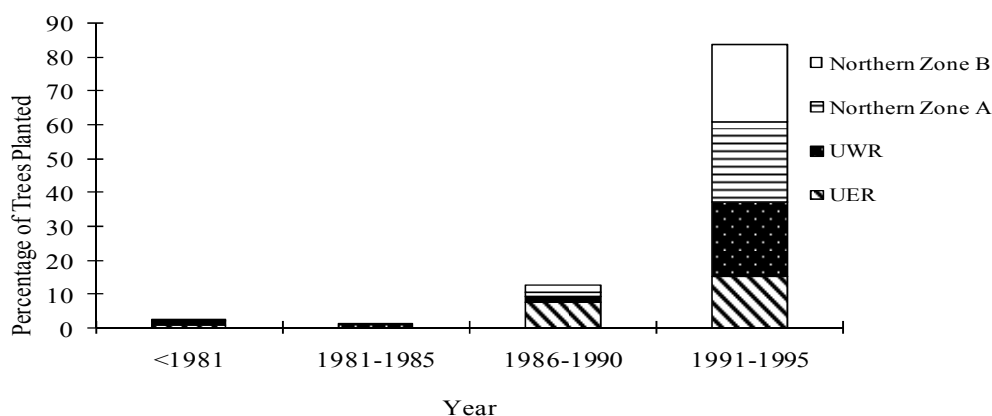


Figure 3: Percentage of trees planted in different years in four study sites

For example, up to 70% of respondents in Northern ‘B’ zone planted a particular species because of the availability of seedlings. Therefore, it is possible that trees not really needed by people may have been planted in some instances. In the Upper East Region 39% of the respondents’ choice was influenced by seedlings supplied by the FSD. In the Upper West Region only 49% of individuals planted species they had requested for or desired.

Trends in Tree Planting

The majority of trees planted by farmers were raised after 1991 (Figure 3). This is probably because initially, the tree planting programme was mainly concerned with amenity planting. It was only when the emphasis of the programme was changed from amenity planting to the cultivation of economic tree crops that the interest of individuals and local communities were raised. Most trees were being cultivated either on family (private), community land or other state lands (others) (Figure 4).

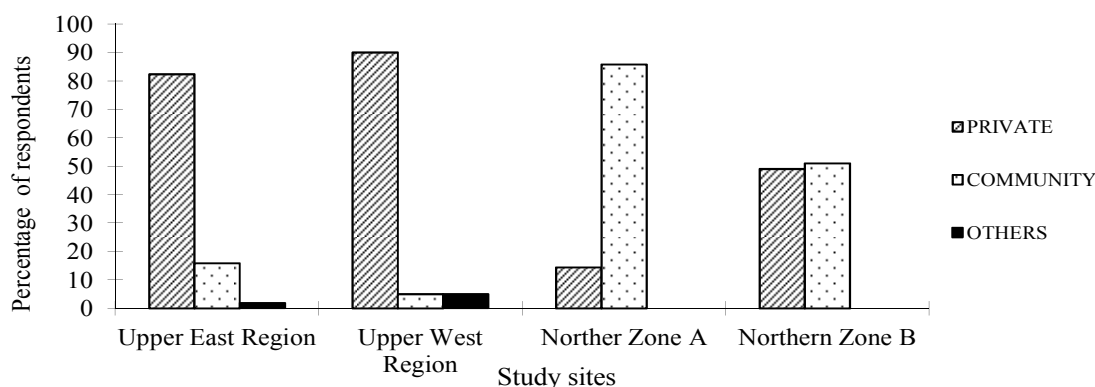


Figure 4: Percentage of respondents planting trees on private and local community land

People's Perception of the tree Planting Programme

Communities perception of the programme was assessed by the importance placed on tree planting in relation to other social services programmes. The respondents ranked education, health, portable water and tree planting respectively, as the most important and desirable projects for community development (Table 4). The communities' appreciation of tree planting was generally low as compared to other services. With the exception of Upper West Region which had 22.8% (second most ranked service) of respondents ranking tree planting, tree planting was the least ranked by respondents in all the areas. More than 90% of respondents were aware of tree planting programmes whilst 81% advocated for increased promotion of the concept in the Northern and Upper East Regions (Table 5). Generally, a higher percentage (74.2%) of respondents interviewed perceived tree planting as fairly important. However, in the Upper West Region (UER) only 39.6% of respondents saw tree planting as fairly

important compared to the higher percentages of respondents in the other study areas (Table 6). The relatively low percentage of respondents perceiving tree planting as fairly important in the UER may partly be explained by the relatively more wooded areas resulting in greater accessibility to forest resources.

In all the regions, demand for seedlings outstripped supply and whenever rainfall had been good, percentage survival of seedlings was equally encouraging. The high level of awareness of the benefits of tree planting programmes among respondents and the high advocacy of the programme are indications of the enthusiasm and seriousness attached to the concept of tree planting.

Factors Influencing the Success of the Initiated Tree Planting Programme

Lack of strong and efficient organization at community level was the most important reason given for not planting trees (Table 7).

Table 4: Relative importance of social projects to respondents in the Upper East (UER), Upper West (UWR), Northern Zone A (NA) and Northern Zone B (NB) regions

Indicator	Percentage of respondents in study sites			
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B
Health	31.3	19.0	37.2	52.0
Water	17.1	16.5	15.8	23.5
Tree planting programme	7.0	22.8	11.2	-
Education	14.0	24.7	16.7	24.5
Other social services	30.3	15.7	18.9	-

Table 5: Respondents awareness and concerns about tree planting programmes

Indicator	% respondents in study sites				Overall %
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Not Applicable	22.2	4.2	8.3	1.0	8.9
Aware, advocating for it	68.1	80.7	82.5	93.0	81.0
Indifferent	-	4.1	7.5	2.0	3.4
Not aware	8.8	7.6	1.7	3.0	5.2
Others	0.9	3.4	-	1.0	1.3
Total	100	100	100	100	100

Table 6: Respondents perception of the importance of tree planting programmes

Rating	% respondents in study sites				Overall %
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Not Applicable	2.2	55.5	6.0	5.6	17.3
Fairly important	80.5	39.6	85.4	91.4	74.2
Not important	17.3	5.4	8.6	3.0	8.5
Total	100	100	100	100	100

Poor extension service, transportation and general lack of interest in tree planting were other important constraints affecting people's participa-

tion in tree planting. The most important motivating factors in the tree planting projects were free supply of seedlings (up to 56% for

Upper West and Northern 'B' zone), food aid (47% for Upper East) and free inputs like nursery materials, cutlasses and boots (Table 8).

Free supply of seedlings played a significant role in tree planting generally. Up to 87% of respondents benefited from this in the Northern Zone B and Upper West Regions. In the Upper East Region however, only 45% of respondents got free seedlings.

Most people planted trees because they wanted to increase their income from farming and also to meet fuelwood requirements. Other reasons given for people's participation were for the provision of fruits (mangoes and guava), shade and environmental protection. The magnitude of the above reasons depended on people's environment and needs. For example in the Northern Region where fuelwood needs are less critical, more emphasis is laid on financial gains to be derived from the sale of poles.

Table 7: Constraints affecting participation in the tree planting programme

Reasons for non adoption	Percentage of Respondents				Percentage
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Not Applicable	15.9	5.0	2.5	-	5.8
Lack of interest	1.8	5.0	1.0	0.19	2.0
Poor extension service	0.9	41.3	39.2	27.7	27.3
No need	6.2	-	0.8	-	1.8
Transportation problem	1.8	9.2	-	-	2.8
Lack of strong efficient organization	73.4	44.5	52.5	71.3	60.4
Total	100	100	100	100	100

Table 8: Factors motivating respondents' participation in the tree planting programmes

Motivation to encourage participation in Tree planting programmes	Percentage of Respondents			
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B
Not Applicable	21.2	6.7	8.3	4.0
Financial gain	29.2	16.0	24.2	36.6
Free seedling	1.8	56.3	48.3	23.8
Food aid	47.8	14.3	19.2	19.8
Others	-	6.7	-	15.8
Total	100	100	100	100

In the Upper East Region on the other hand, fuelwood deficit is high and people plant mostly with the aim of meeting fuelwood needs. It came to light that the use of *T. grandis* poles in the rural electrification projects had a positive influence on people's response to tree planting. Common factors that prevented respondents from planting more trees were lack of seedlings (particularly in the Upper West Region), high cost of maintenance and unavailability of labour especially during the farming season (Table 9).

Land size is also an important constraint in the Upper East Region. The most important factor that led to poor establishment of planted trees was drought resulting from erratic rainfall. Other important factors leading to unsuccessful establishment of planted trees include late planting, browsing and bush fires.

DISCUSSION

Perception and Participation of Local Communities in Tree Planting Programmes

According to Akbar *et al.* (2000), the perceptions of local people are important in the development of agroforestry programmes. Arnold and Dewees (1999) also argues that little is known about farmers' perceptions of trees, tree products and related aspects compared to what is known about their perceptions of agricultural crops and practices. In the study area, initial participation in the tree planting programme was low, probably because the emphasis was on amenity planting, which the communities regard as of low priority. The individual farmers did not see any personal benefits in such projects.

Table 9: Reasons for not planting more trees in the various study areas

Reasons	Percentage of Respondents				Overall Percentage
	Upper East Region	Upper West Region	Northern Zone A	Northern Zone B	
Inadequate labour	17	4	6.1	19.3	12
Transportation	-	4.7	5.3	3.3	3.3
Late planting	9	3.5	-	2	3.6
Risk	21	6	1	-	7.0
Lack of seedlings	8	38	24	-	17.5
No land	19	1	2.3	6.9	7.3
Cost of maintenance	17	15.8	3.8	-	9.2
Other projects	5	20	47.3	51.2	30.9
Other resources	4	7	10.2	17.3	9.6

Turnbull (1995) has indicated that any successful tree planting programme in degraded areas should focus on solving social, economic and policy problems of the local communities.

Contreras (1983) assert that, tree based interventions can only be effective if it takes into account local needs and aspirations. Active participation of local people or communities in such initiatives can ensure effectiveness. More recent findings have also shown that the level of literacy, level of participation in extension-education courses, social interaction and attitude toward participatory activities positively correlate with the level of motivation of villagers' participation in activities such as tree planting (Faham, *et al.*, 2008). By this measure the success of such programmes will depend on community motivation based on a feeling of communal ownership. Ewnetu and Bliss (2010) also pointed out that for the success of any rural development interventions that involve tree production on farms, it is essential to have a clear understanding of farmer's incentives and livelihood strategies within the socioeconomic and policy environment they are operating.

Factors Influencing Tree Planting Programmes

In the study area, the most important motivating factors in the tree planting programme were free supply of seedlings, food aid and free inputs like nursery materials such as cutlasses and boots. Food aid was identified as one motivating factor which significantly contributed to participation in all communities as most people planted trees because of the daily access to food aid and not because the trees were beneficial to them in the long term. According to Kinuthia *et al.*, (2011), farmers with better knowledge of tree benefits will participate in tree planting programmes allocating more acres of land to it than those with inadequate

information. In the study area, financial benefits from trees were also an important motivating factor influencing participation in the tree planting programme. Consequently, it is imperative to formulate an effective policy that identifies the appropriate categories and the types of incentives required to adequately support each category.

Constraints to participation in the tree planting programmes in the study area were observed at individual and community levels. Poor extension services and lack of strong and efficient organization were predominant constraints outlined to influence participation. This is consistent with findings of Collier *et al.*, (2002) who found out that farmers with better information regarding afforestation were better positioned to engage in planting trees on their lands. Due to the relatively high poverty rate in the study area compared to the other parts of the country, individuals are not able to afford the additional high cost of seedling establishment, tree cultivation and maintenance on their farms. Poor extension service, unavailability of labor especially during the farming season, transportation and general lack of interest in tree planting were other important constraints affecting people's participation in tree planting practices.

Benefits of Tree Planting on Household and Community Welfare

Hyde and Köhlin (2000) observed that successful social forestry activities such as tree planting initiatives must be assessed in terms of their contributions to human welfare. Emphasis should be placed on the integration of multipurpose trees, especially those that enrich soils and also provide fuelwood as well as fodder, fruits and shade, albeit on a small scale (Behl, 1991). Apart from satisfying the needs of farmers, such initiatives should broadly focus on identifying innovative traditional forestry systems that ensures

sustainable savanna woodland management by local communities. Consequently, there is need to shift away from the traditional technology transfer and research and development (R and D) model approach to a more farmer-led collaborative approach (Amanor, 1996; Wardell, 1996). Because trees are grown also for long term benefits and their survival determined by social dynamics it is important to identify components of social structure that transcend inter-generational landmarks and other changes in society (Sood, 2005).

Current practices of tree planting initiatives in the study area are such that trees are only temporarily planted with crops during the initial establishment phase of woodlots. This practice is beneficial in areas of low population density. However, in densely populated areas, e.g. Upper East Region, the benefits from integration can only be maximized if a system is developed in which crop and tree combinations are made more permanent. Normally, where environmental problems occur, there are also a lot of traditional innovative practices (Blench, 1996; Amanor, 1996). However, the farming system in such areas has not evolved as it should due to the relatively high migration rate of young and innovative people. Emphasis should therefore be placed on research and on-farm trials which focus on the evolution of innovative tree farming systems.

CONCLUSIONS

Northern Ghana is the most degraded and economically deprived area in Ghana. However, tree planting to reverse environmental degradation and improve the socio-economic lives of the people has not been very successful (Nsiah-Gyabah, 1994). One major strategy for overcoming most constraints to tree growing and to secure active participation of individuals and

communities is the provision of incentives to intended beneficiaries. To effectively run and support the incentive programme, policies on funding mechanisms, tenure, extension, research, manpower development and institutional capacity building need to be developed. Some key considerations in this regard include:

1. Adoption of a farmer or local community-led approach to tree planting initiative to ensure effectiveness.
2. An initial feasibility studies and needs assessment which focuses on the socio-economic needs and preferences of participating communities.

REFERENCES

- Akbar, G., Baig, M. B. and Asif, M.** (2000) Social aspects in launching successful agroforestry projects in developing countries', *Science Vision*, 5: 52-58.
- Amanor, K. S.** (1996) Managing trees in the farming system: The perspectives of farmers. Forest Farming Series No. 1. Forestry Department, Ghana. 202 pp.
- Arnold, J. E. M. and Dewees, P. A.** (1999) Trees in managed landscapes: factors in farm decision making' in L. E. Buck, J. P. Lassoie, and E. C. M. Fernandes, eds, *Agroforestry in Sustainable Agricultural Systems*, Lewis Publishers Inc., Boca Raton, pp. 277-294.
- Baker, H. G.** (1962) The ecological study of vegetation in Ghana. In: *Agriculture and Land Use in Ghana*. Wills, B.J. (Ed.). Oxford University Press. London
- Behl, C. B.** (1991) An Analysis of Farm and Village Forest Use Practices in South and South East Asia. Trees and Farms in Asia. Report No. 18

- Blench, R.** (1996) The role of District-Level Planning: Upper East and Northern Regions. ODI, U.K.
- Collier, P., Dorgan, J. and Bell, P.** (2002) Factors Influencing Farmer participation in Forestry. Council for Forest Research and Development (COFORD), Dublin.
- Contreras, A.** (1983) Monitoring and evaluation of benefits to rural poor. Report of the FAO/SIDA Consultation on Forestry Administration for Development. pp 12.
- Ewnetu, Z. and Bliss, J. C.** (2010) Tree growing by small holder farmers in the Ethiopian Highlands. Small scale forestry in a changing world: opportunities and challenges and the role of extension and technology transfer IUFRO Conference: 3.08. Small Scale Forestry, 6.06.02 Extension, 6.06.01 Technology transfer Bled, 06–12 June 2010.
- Faham, E., Rezvanfar, A. and Shamekhi, T.** (2008) Analysis of Factors Influencing Motivation of Villagers' Participation in Activities of Social Forestry (The Case Study of West Mazandaran). *American Journal of Agricultural and Biological Science*, 3.
- Hyde, W. F. and Köhlin, G.** (2000) Social forestry reconsidered. *Silva Fennica* 34(3): 285–314. IMF and WORLD BANK (2005). News Release No: 2005/21/PREM Downloaded at: <http://web.worldbank.org/WEBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/GHANAEXTN/htm> | July 2009.
- Jama, B., Njui, A. and Njenga, K.** (2003) Management and utilization of dryland forests in Sub-Saharan Africa: the role of agroforestry. Paper presented at VITRI/ETFRN/IUFRO-SPDC workshop. Trees, agroforestry and climate change in dryland Africa (TACCDA), Hyytiälä, Finland, 29 June - 4 July 2003 .
- Kinuthia, E. K., Owuor, G., Ngyo, W., Kalio, A. M. and Kinambuga, D.** (2011) Factors influencing participation and acreage allocation in tree planting program: A Case of Nyeri District, Kenya. *Agricultural Science Research Journal Vol. 1*(6), pp.129-133. August 2011.
- Laube, W.** (2007) Changing natural resource regimes in Northern Ghana: actors structures and institutions. Deutsche Nationalbibliothek Publication. 367pp.
- Ministry of Environment and Science** (2002) The Republic Of Ghana, Geographical and Ecological Background. Downloaded from <http://www.cbd.int/doc/world/gh/gh-nbsap-01-en.pdf>, July, 2009.
- Nsiah-Gyabah, K.** (1994) Environmental degradation and desertification in Ghana: A study of the Upper West Region. Avebury publishing Ltd, UK.
- Pal, R. C. and Sharma, A.** (2001) Aforestation for reclaiming degraded village common land: a case study. *Biomass and Bioenergy* 21 (2001) 35–42.
- Siaw, D. E. K. A.** (1998) State of Forest Genetic Resources in Ghana, (Forest Genetic Resources Working Papers) Prepared for The sub- regional workshop FAO/IPGRI/ICRAF on the conservation, management, sustainable utilization and enhancement of forest genetic resources in Sahelian and North-Sudanian Africa (Ouagadougou, Burkina Faso, 22-24 September 1998).
- Sood, K. K.** (2005) Role of social aspects in extent of on-farm tree growing in subsistence agroforestry systems of Western Himalaya; Small-

Scale Forestry, Vol, 4, No 3, September, 2005. Pp 293-310 Springer Netherlands. Turnbull, J. (1995). CIFOR's research on Reforestation. Tropical Forest Update 5(1):12.

Wardell, D. A. (1996) Participatory approaches to forest resource management in Northern Ghana: Regional Forestry Office, Upper East Region, Ministry of Lands and Forestry, Ghana. 56 pp.