COMMUNITY EFFORTS TOWARDS FARMS MANAGEMENT THROUGH AGROFORESTRY ACTIVITIES IN WESTERN KENYA

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Abstract

The study sought to investigatecommunity farms management efforts through agroforestry activities in western Kenya. The study employed descriptive research design. The population of 400 households along Kakamega forest was randomly sampled to provide requisite information to support this study. Household data, besides documented data from government of Kenya and other agencies, were used to reveal land-use agroforestry and afforestation activities. The study findings revealed existing human resource potential to implement and manage a successful farm-based carbon dioxide arresting project through self-help organizations such women's groups and business affiliation, which are available in communities. Further, the findings revealed contribution of a community-based group, Kakamega Environmental Education Program (KEEP), in marketing alternative income products such as butterfly pupae, energy saving stoves and tree nursery seedlings. The study recommended such energy saving stoves and alternative forest products by households as suitable initiatives in arresting of excess carbon dioxide and mitigating climate changes. The initiatives contribute to sustainable agricultural production in western region of Kenya.

1.1Introduction

Over the past two decades, climate change has evolved from a debate as to whether the planet is really warming or there is increased focus on how to mitigate and adapt to its impacts. This is as a result of the growing acceptance among scientists, policy makers, and even the general public that climate change is real and happening. This acceptance is based on overwhelming evidence presented by the scientific community through intensive monitoring of global climatic systems, extensive observations on changes in terrestrial and aquatic systems, and predictive modeling [1]. The results of various assessments of impacts of climate change on agriculture are generally in agreement with identified global environmental challenges[2].

Agriculture is one of the high-priority sectors upon which the impacts of climate change if exceed tolerance limits, will lead to serious implications on the livelihoods of millions of smallholder farmers [3]. Agroforestry interventions posses ability to provide economic and environmental benefits, are considered to be the best measures in making communities adapt and become resilient to the impacts of climate change. Despite the availability of overwhelming evidence in support of climate change, uncertainty prevail over the exact nature and consequences of climate change especially at local level, making it difficult to plan and develop appropriate adaptation strategies, programs, and technologies.

Developing countries are located in the tropics and rely heavily on agriculture for food and income. However, relatively poor countries with limited resources face costly and formidable task of adapting to climate change [2]. Kakamega Forest is one of the few lowland rainforests remaining in the series of fragmented forests in East Africa. It is currently the only lowland rainforest of its kind in Kenya and East Africa [4]. Over 50% of the forest has been occupied by the surrounding community in the last decades of the 20th century although the forest was officially gazetted for protection in 1933 [5]. Population pressure has been cited as a primary factor influencing sustainable use of forest resources in Kenya [4]. One of the emerging threats to livelihood, food productivity and sustainability in Sub-Saharan countries is climate change [6]. This comes as a result of greenhouse gas emissions (GHG) such as carbon dioxide, which is contributing to global warming and climate change.

Carbon dioxide emissions are generated from human activities, in particular deforestation, burning of fossil fuels and changes in land use. Over 90% of the people living near the forest use its resources to acquire related products such as fuelwood, polewood and charcoal to supplement their income [7], which in turn results in considerable disturbance of the forest ecosystem. While there is general consensus on the beneficial effects of trees in moderating and ameliorating the microclimatic conditions, there is still considerable uncertainty on the productivity and economic benefits of these systems [8].

In a parallel development aimed at improving the diagnosis and monitoring of soil quality, the World Agroforestry Centre has made substantial progress in application of infrared spectroscopy for rapid analysis of soils and various other organic resources [9]. The technique not only provides a better understanding of the complexity and diversity of local soils, but also serves as a tool for monitoring soil quality for environmental protection.

The study therefore aimed at investigating the current community participation in forest management and households' decisions to plant trees and how resultant activities may be directly influenced by household-specific, plot-specific and institutional factors [10]. This was to inform on how better educated household heads or households can access government or farmer–farmer extension services and be better adopters of farm forestry [11]. Further, study was to disclose women's groups and business affiliations activities in communities adjacent to forests,[12], including support and credit for income diversification projects.

1.2 Methods and Results

The study site for this survey was around Kakamega Forest which is situated in Kakamega County in Western Province of Kenya. It lies north-east of the Lake Victoria between latitudes of 00°10'N and 00°21'N and longitudes of 34°47'E and 34°58'E at about 1600m above sea level. The forest area is drained by two main river systems, the Isiukhu River to the north and the Yala River to the south.   The forest is the only remaining rain forest in Kenya and is the furthest east remnant of the Guinea-Congolean rain forest.

The data for this study was collected from communities around Kakamega forest. A random sample of 400 households was assessed using a detailed semi-structured questionnaire. The sampled households were randomly interspersed in the study area and across the three management regimes (Community, Nyayo tea zones and Kenya Forest Services). Figures 1, 2, 3 and 4 show a summary statistics for the variables used in the study.
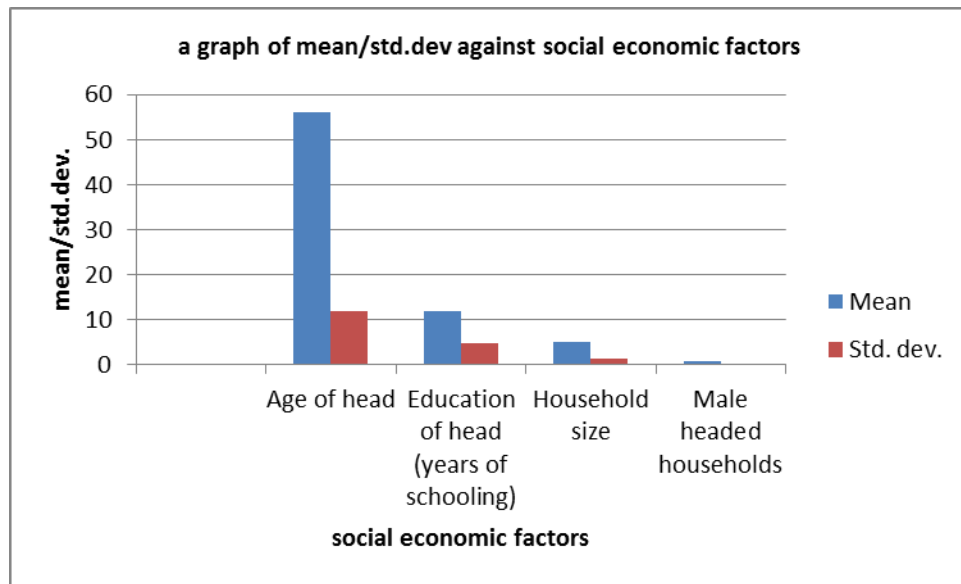
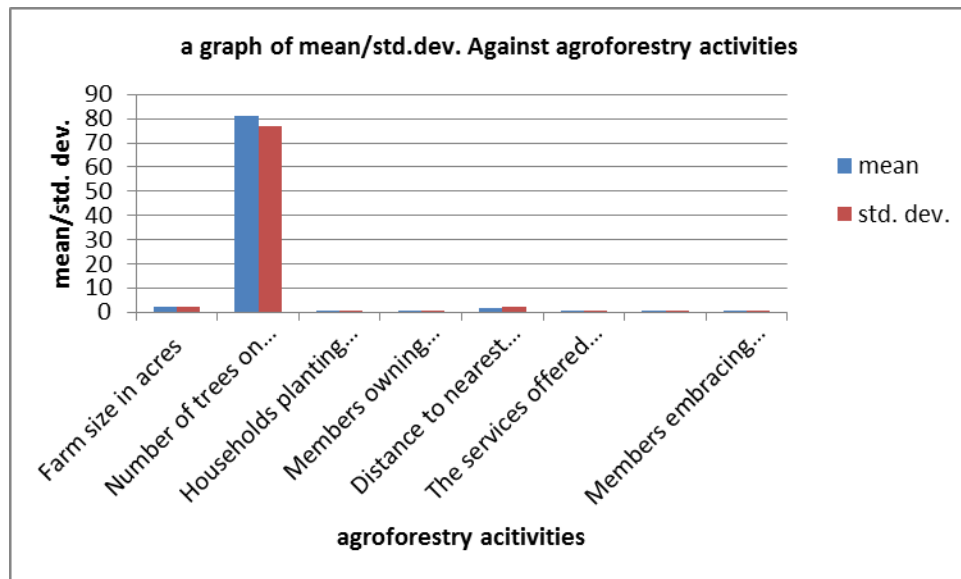Figure 1: Kakamega forest neighbouring farms descriptive statistics N=400

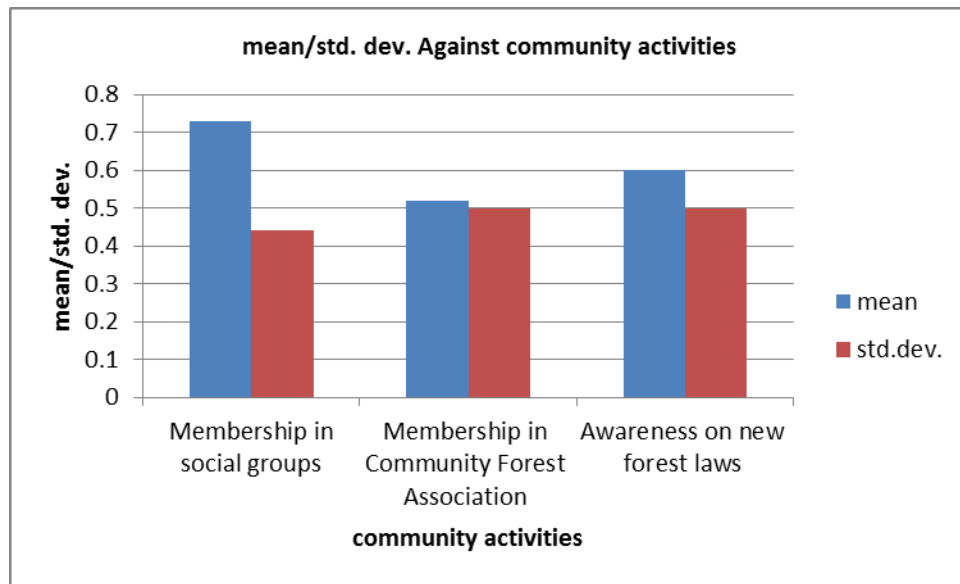Figure 2: Kakamega forest neighbouring farms Agroforestry descriptive statistics N=400

Figure 3: Kakamega forest neighbouring farms descriptive statistics N=400
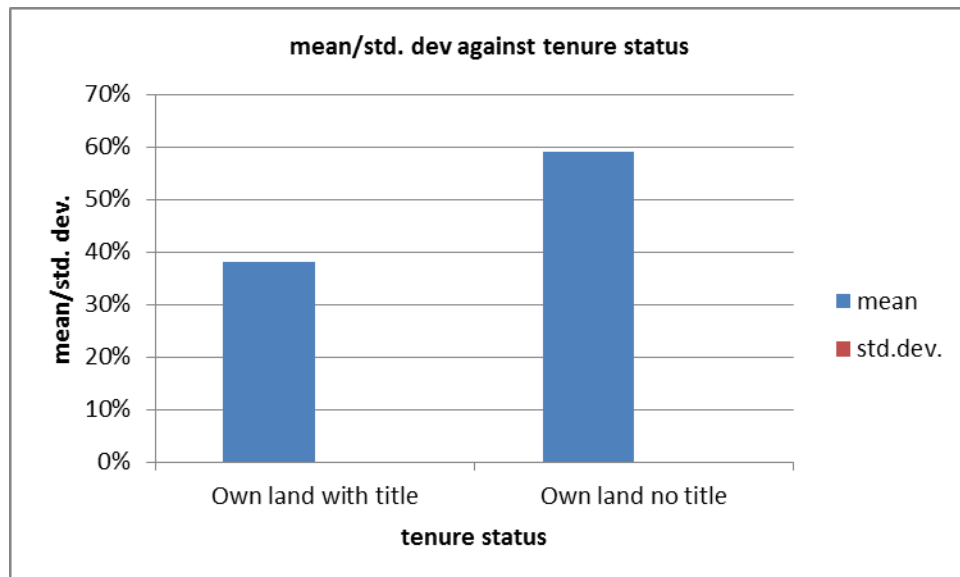

Figure 4: Kakamega forest neighbouring farms tenare status descriptive statistics N=400

1.3 Discussion

The household characteristics show that the average age of the household heads is over fifty years, with the average number of schooling of ten years. The low education level of the household head is a contributor to their inability to secure more remunerative employment opportunities elsewhere, thereby resorting to farming activities. Education increases household's off-farm employment opportunities. Furthermore, highly educated members of the household tend to look for greener pastures in off-farm activities. This is because of the traditional nature of farming activities within the region which many people view as not competitively rewarding compared to non-farming activities. The average household size measured in this survey is five members. Of the households interviewed significant percent were male headed. On the farm characteristics, the average farm size in Kakamega is 2.2 acres; 76 percent of households practice farm forestry while the mean value of household embracing sources of income is 0.73. The average distance to the nearest forest edge is 1.5 km. On average, 23 percent and 17 percent of the households had access to extension services and credit facilities respectively.

With regards to institutional attributes, 73 percent of households participate in social groups while 52 percent participate in community forest management through Community Forest Associations. In terms of tenure security, 38 percent of households owned land with title deeds while 59 percent owned non-titled land. Households that are aware of the new Forest Act, which actually introduces community participation in management of forests, are more likely to join CFAs. Such people definitely understand that it is only through participation in CFAs that they stand to gain from the government forest. Distance to the government forest influences selection negatively because one of the main reasons for participating in CFAs is to gain access to the forest for extraction of specific forest products. As a result, those who live far from the forest have no motivation to join CFAs. Similar results are associated with male-headed households most probably because such households are able to raise own farm forests from which to obtain the basic products which would have otherwise made it necessary to access government forest through CFAs.

The geography of Kakamega is such that the forest is closer to the town. The implication of this is that, if town is the main market, those living far from the market are also far from the government forest, the alternative source of forest products. Of special interest in the outcome is the household heads, household size, social capital and farm size. All are significant and indicating that, holding other factors constant, male-headed households, larger households, larger land size and more participation in social organizations are associated with planting of more trees. On the contrary, secure land tenure is associated with planting of fewer trees or under-development of farm forestry.

The fact that male household heads are associated with planting of more own farm trees is more cultural than economics. Planting of trees is viewed more as a man's activity than a woman's. Other activities like fencing and construction of household's dwelling units are also viewed as a man's responsibility and these could compel a man into planting more trees in anticipation of future needs.

Larger households tend to plant more own farm trees. There are two main angles to this larger households have larger requirements for forest products such as fruits, fuel wood and medicinal plants. This could make it more prudent and economical for such households to establish own farm forests. The second angle is that tree planting is labour-intensive and larger household are capable of using own labour to accomplish the tasks involved. Diversification of livelihood sources to meet the pressure of feeding a large family may provide an alternative explanation.

Households with large pieces of land, all else equal, plant more trees. This is because trees compete with other crops for land. Those with smaller pieces of land may, therefore, devote the entire parcel for food crop production as opposed to large land holders who are able to either inter-crop food crops with trees or even set aside portions of land exclusively for trees. For households that use trees to mark plot boundaries, it follows that that the larger the piece of land, the more the trees planted. One would expect households with secure land tenure to be more motivated to plant trees because trees take a longer time to manure. However, on second thought and taking cognizance of the Kenyan situation, trees are a means of entrenching land ownership, either on plots that are not regularly cultivated or on untitled land. Consequently, households with insecure land tenure are predisposed to plant more trees, not as an economic investment but as evidence of ownership should disputes arise.

1.4 Conclusion and Recommendations

This study focused on how participation in community forest management was introduced in Kenya by the Kenya Forest Act (2005), and how other factors impacts on development of farm forestry and the way they have been perceived as a vehicle through which to increase the country's forest cover and store carbon. The growing and compelling evidence about global warming and its impact on global climatic systems has firmly established that climate change is real and that its consequences will be serious especially for Africa more than any other continent. The agricultural impacts of climate change are of the greatest concern to most developing countries, particularly in the tropics, because of higher dependence on agriculture, subsistence level of operations, low adaptive capacity and limited institutional support. Using household data collected from Kakamega forest communities and controlling for selection bias, the study made following key findings;

It was noted strongly that households that are involved in community forest management through Community Forest Associations (CFAs) are associated with under-developed farm forestry possibly because they are able to meet their demands for forest products from government forests. The policy implication of this is that, while the new system of forest management may be important for protection of existing forests, it could be counter-productive to increasing the total forest cover in the country. An intensive campaign for farm forestry development should therefore accompany it. Secondly, secure land tenure is important for development of farm forestry because trees take a longer time to mature.

Third, small landholders are hesitant to plant trees possibly because the land cannot accommodate both crops and trees. One thing that peasants should be made to understand is that investing in trees could be more profitable than investing in food crops. Proper education and introduction of high value fast maturing tree species could overturn the current perception of the peasants. Fourth, education level of the household head and his/her awareness of the Forest Act (2005) favour development of farm forestry. This underscores the need to target household heads in dissemination of information on importance of forests at household, national and global level, and the content of the current Forest Act. For instance, the government could provide tree seedlings or farm forestry funding through community groups.

In addition to an in depth understanding of the benefits from the systems and farmer requirements, mainstreaming of agroforestry requires better market linkages for the goods and services produced. An analysis of consumer needs, local and regional markets including the opportunities for linking carbon sequestration benefits to the CDM, and promotion of market intelligence systems and farmer associations are some of the areas where interventions are required to link smallholder farmers with markets.

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