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Adverse Effects of Human Activities on Forest Reserves in Ghana: Lessons of Experience from the Yenku Forest Reserve in the Central Region

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ABSTRACT

This study examines the threat posed to sustainable forest management of human activities of communities within the Yenku Forest Reserve in the Central Region of Ghana. The reserve was identified for the study because it is the largest forest reserve has the highest number of fringe communities and is one of the most degraded forest reserve in the Winneba Forest District. Data, and observations and semi-structured were deployed for soliciting series of individual semi-structured interviews, focus group discussions, and observations were deployed to solicit data from residents within the fringe communities of the Yenku forest reserve. The findings of the study are that farming, charcoal burning, hunting, and harvesting of non-timber forest products are the major human activities and constitute the livelihood and survival of the fringe communities. The consequence of these human activities is the continuous degradation of the land, a decline of soil fertility, soil erosion, deforestation, and forest degradation, wildfires, and depletion of wildlife. The interviewees reported that they have little or no role to play when the issue of sustainability comes up in the management of the Yenku Forest Reserve. It emerged from the study findings that traditional authorities within the fringe communities and all relevant stakeholders needed to be actively engaged in the making of decisions regarding the Yenku forest reserve so as to integrate local peoples' knowledge and livelihood objectives and strategies into the choices made and to improve the management of forest resources.

INTRODUCTION

The Yenku Forest Reserve falls within the Southern savanna dry forest zone of Ghana. It contains many Non-timber Forest Products (NTFP's) on which most local people in the fringe communities of the reserve depend for their livelihood. According to Amoah (2004) Evidence from a recent socio-economic sustainability survey of the fringe communities indicates that the reserve abounds in various flora and fauna with about twenty three species of very high commercial value (Amoah, 2004). The survey revealed the Yenku Forest and its environ have over the years experienced devastating encroachment from human activities from the fringe communities with the catchment areas of the Gomoa East and West District Assemblies. These human activities have adversely altered affected the sustainability of forest resources, the Carbon Cycle and human survival. Over exploitation of forest economic resources, especially fuel-wood/firewood, illegal hunting of animals/birds, preponderance of traditional farming practice of 'slash and burn' farming and charcoal production are among the dominant human activities responsible for the decimation of the Yenku forest.

Even though earlier studies suggest that the communities are aware of the various human activities ongoing in the forest, the effects and implications of their activities for the sustainability of the forest appeared not to have come to the attention of the people. This means that majority of the local people were aware of their illegal activities in the reserve, but are ignorant of the dangers posed

by those activities. Socio-economic sustainability survey however did not address the local people's perception about the sustainability of the forest and how the effects of their activities and its implications pose challenges to sustainable management of the reserve. There is no doubt about these human activities due to persistent annual wildfires in the reserve despite the numerous wildfire educational campaigns by the Winneba Forest District during the dry season. The socio-economic survey (Amoah, 2004) revealed also that 97.8% of respondents were aware of the existing laws relating to protection of forest reserves and 82% of them confirmed that the laws were enforced, offenders arrested by forestry officials and arraigned before the law courts for prosecution and items involved confiscated. It is within this context that this study seeks to examine the extent to which local people in the forest fringe communities perceive the challenges of sustainable management of the Yenku Forest Reserve through the effects of human activities.

The study objectives were to:

- Identify the various types of human activities ongoing in the reserve and its effects on the reserve;
- Gauge the level of knowledge and awareness of the local people about the effect of their activities on the Yenku Forest and climate;
- Explore the views of the local people about issues of sustainable management of the Yenku Forest Reserve.
- Examine the problems of sustainable management in respect of the reserve.

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hunting and, farming which contribute immensely to livelihoods and income of the local people. The study spanned the period of June-December 2013.

The two (2) districts have two main vegetation zones, the coastal savannah and the moist semi-deciduous forest. The former consists mainly of grassland and trees of patches of scrub, while the latter is characterized by tall trees interspersed with grass cover, shrubs and soft woody species. The districts experience two rainfall patterns - major rainy season (April - July) and minor rainy season (September - November). Mean annual rainfall ranges between 70 and 90cm in the southern coastal belt and 90 to 110cm in the northern and northwestern semi-deciduous forest areas. However available statistics reveals a fluctuating rainfall pattern. Its mean annual maximum and minimum temperatures of 29°C and 26°C occur in February to March and August respectively. The relative humidity is influenced by the presence of large water bodies like the ocean, rivers, lagoons and streams. The relative humidity ranges between 70% and 80%. (www.gomoawest.ghanadistricts.gov.gh). The topographic map of the study area is shown in figure 1 above.

The case study research design was used for this study. Case studies are in depth or intensive descriptions and analysis of a single unit or bounded systems such as an individual, programme, event, group, intervention or community (Tagoe, 2009). The study employed the qualitative approach through focus group discussion in a free and relaxed manner. This enabled the participants to give elaborate, in-depth information and new innovative ideas on issues concerning human activities and their implications on sustainable forest management. Discussions were recorded with a voice recorder and the information extracted afterwards. Field observations and notes also formed part of the data collection. The recorded version gave in-depth information on the issues discussed. Data on trends of forest vegetation cover change from 1990 to 2010 were also collected from CERGIS. The data collected was therefore analyzed thematically.

The study population comprised farmers, firewood cutters, hunters and charcoal producers from the nine (9) fringe communities of the reserve. This portion of the population was chosen for the study because they are those local people who encounter the forest reserve in their normal life situations each day in the course of their businesses.

The sample size for the study consisted of eight (8) farmers and two (2) hunters making ten (10) people drawn from each of the nine (9) fringe communities of the reserve. Four (4) farmers double as firewood cutters and charcoal producers. Addis *et al.* (2005) recommends 6-8 people for focus group discussions at a time. The total sample size for the study was ninety (90) people from all the nine (9) fringe communities. The views and ideas of the focus group were asked for on their perception on impact of human activities on sustainable management of the Yenku Forest Reserve, and ways to improve and

enhance the forest resources for present and the future generations.

The purpose sampling procedure was employed to ask for information from the farmers within each of the local fringe communities. This is because they directly encounter the forest daily for farming, firewood cutting, charcoal production and hunting activities in the reserve. The snowball technique was also used to select farmers who double as firewood cutters and charcoal producers. This made a fair representation of the ten (10) members of each focus group in respect of various activities.

The qualitative method was employed by the researcher in gathering data for the study. A qualitative research allows for probing which helped to generate the needed information for the study. Interview guide was used to obtain in-depth information about various human activities in the reserve and the perception of the respondents on human induced climate change issues. The focus group discussions were recorded with a voice recorder and extracted for data analysis. As part of the data collection approaches, the author gathered field notes by spending one (1) hour to observe various field activities in the Yenku Forest Reserve after discussions in each community. The focus group discussions lasted for one (1) hour to two (2) hours. One question was asked at a time and any group member with an idea was allowed to answer whilst being recorded. This was followed through until a question was exhausted. The Akan language was used in all discussions since most of the farmers did not understand the English Language.

Information gathered using the questionnaire guide was analyzed as follows;

Firstly, the audio-taped raw data was transcribed and field notes taken during data collection were examined. In preparing the data for analysis the field notes were typed. The data was sorted and arranged thematically depending on the source and categorization of the information. The researchers read through the information to obtain key ideas and themes and sub-themes that emerged from individual and group interviews and observation from the field. The thematic data were computed with particular attention to the dominant themes and their validity and reliability of the frequencies within the data. The detailed analysis of the data gathered then started with coding the various themes and sub-themes. The data analysis process included segregation of the dominant themes, sub-theme and text data collection, separating of specific sentences, and labeling text data according to the respondents' views.

RESULTS AND DISCUSSION

Human Activities in the Reserve

It was revealed through the interviews that the communities visit the forest reserve frequently for various reasons including farming, hunting, and collection of non-timber forest products (NTFPs). The elderly amongst the local people said they usually visit the forest to collect medicinal plant parts. Some respondents said they enter the forest to hunt grass cutters and antelopes

who feed on their food crops during the farming seasons. However, majority of respondents at the discussion disclosed that between 2002 and 2009 the Forest Services Division had been releasing degraded portions of the forest for agroforestry purposes under the National Plantation Development Programme of successive governments. This module is termed Modified Taungya System (MTS) by the Forest Services Division where forest fringe community farmers are allowed to plant food crops within tree plantations until the tree canopy closes usually within three (3) years. However, this programme was stopped in 2009 and the farmers now have difficulties in their farming activities. Most of the respondents complained of land hunger as a major threat to their livelihoods since they are basically food crop farmers who depend on subsistence farming for household income. Under the MTS, farmers provide labour for land clearing, tending, and protection of the plantations to its rotation period.

There is also a Benefit-Sharing Agreement (BSA) with the farmers, stool land owners and communities to take 40%, 15% and 5% share respectively of the produce from the plantations, while the Forest Services Division will take 40%. This arrangement under the MTS gave them the legitimate right to enter the reserve to farm for survival. The respondents further mentioned that illegal farming stopped entirely during the period of 2002-2009. This is because it was difficult for people who were not involved in the plantation project to sneak into the forest and farm. Protection of the forest was therefore enhanced according to the respondents. A total area of 171.23ha was planted with tree species including Cedrella, Cassia, Teak, Ceiba and Mahogany in the reserve under the MTS. On charcoal production, the respondents indicated that they used to carry tree stems, branches and stumps from the areas they clear during the farming season to burn charcoal outside the forest reserve. However, some lamented that even after the MTS stopped, people usually burn charcoal using trees from the reserve. On the other hand, the elderly of those who collect medicinal plant parts said they use them for treatment of ailments and other diseases like stomach aches, broken limbs and malaria. It was however, revealed by some of them that though the area is rural, the use of medicinal plant is not much and this is due to fading out of traditional means of healing to orthodox medicine which has made the young ones ignorant about most effective medicinal plants in the forest.

It was also realized from the discussion that NTFPs were collected from the forest in different proportions and for several purposes. Majority of them harvest the NTFPs for personal use while others sell their harvest from the forest especially those who do not farm in the forest. The reason for total dependence on the forest for NTFPs is that what they want cannot be obtained outside the forest from farmlands which are rather more devastated than the forest. This shows that majority of people harvest due to the fact that what they want cannot be obtained outside the forest. Steps should therefore be taken to ensure that those products that can be cultivated outside the reserve are done especially tree planting on farmlands to recover lost vegetation, improve soil fertility and enhance NTFP production.

The variety of products collected are mushrooms, medicines, chew sticks, pistles, bushmeat, snails, firewood, and building posts, among others. Quantities collected could not be estimated, hence a proper way of estimate in the form of a quota should be adopted and enforced if collection of products from the forest will be permitted and sustained. The respondents further indicated that daily quantities of NTFPs collected over the past 30 years were much higher than what they collect today from the forest. The implication here is that, everyone who entered the forest in one way or the other collects something from the forest, be it fauna or flora and this has gone on for generations.

Implications of Human Activities

The respondents indicated that the Yenku Forest Reserve used to be so flourishing with trees with very green vegetation cover over the past 30 years and that farming lands outside the forest were also very fertile. They conceded that, overexploitation of NTFPs and farming activities have resulted in deforestation and degradation of the forest which also resulted in inadequate rainfall in the area. They lamented that even the little rain that occur in the reserve comes with heavy storms. Majority also cited wildfires as the other reason for the degradation of the forest. The respondent information on the status of the forest cover over the past 30 years is confirmed by data analysis from the Centre for Remote and Geographic Information Services (CERSGIS) at the University of Ghana, Legon which depicts a matrix of land cover changes over the past 30 years from 1990 – 2010 in the Yenku Forest Reserve in the table 1 below.

Table 1: Matrix of land cover by class values for the year 1990, 2000 and 2010

Class Value / Year	1990		2000		2010	
	Land cover	%	Land cover	%	Land cover	%
Closed savanna woodland with dense herbaceous cover	470.61	21.14	195.12	8.76	25.52	1.15
Open savanna woodland with dense herbaceous cover	1053.45	47.32	1127.44	50.64	987.12	44.34
Dense herbaceous / grassland cover	524.34	23.55	535.23	24.04	658.50	29.58
Grassland / shrubs cover	139.14	6.25	217.26	9.76	298.20	13.39

Bare surface/short grass cover	38.79	1.74	151.28	6.80	257.00	11.54
Total	2226.33	100.00	2226.33	100.00	2226.34	100.00

Source: CERSGIS, 2013

The matrix indicate the trend of depletion of the natural closed Savanna woodland forest with dense herbaceous cover of the Yenku Forest Reserve as 21.1%, 8.8%, and 1.2% for the years 1990, 2000 and 2010 respectively. The dense cover in terms of area has reduced from 470.6ha to 195.1ha and 25.5ha respectively over the 30 year period which is very remarkable. The open Savanna woodland area with dense herbaceous cover has on the other hand increased from 47.3% in 1990 to 50.6 in 2000 but further reduced to 44.3% in 2010 with respective trends of area coverage of 1053.4ha, 1127.4ha and 987.1ha. The dense herbaceous and grassland cover increased from 524.3ha,

535.2ha to 658.5ha with percentage increase from 23.5%, 24.0% and 29.6% for 1990, 2000 and 2010 respectively with a sharp increase recorded between 2000 and 2010. This might have been captured by the satellite to include the plantation established between 2002 – 20009. Grassland and shrub cover has also increased as 6.2%, 9.8% and 13.4% for the period under review whilst bare surface and short grass cover has also increased tremendously as 1.7%, 6.8% and 11.5% for the same period. The maps in figures 2, 3 and 4 depict the classified satellite images of forest cover changes for the years 1990, 2000 and 2010 respectively in the Yenku Forest reserve.

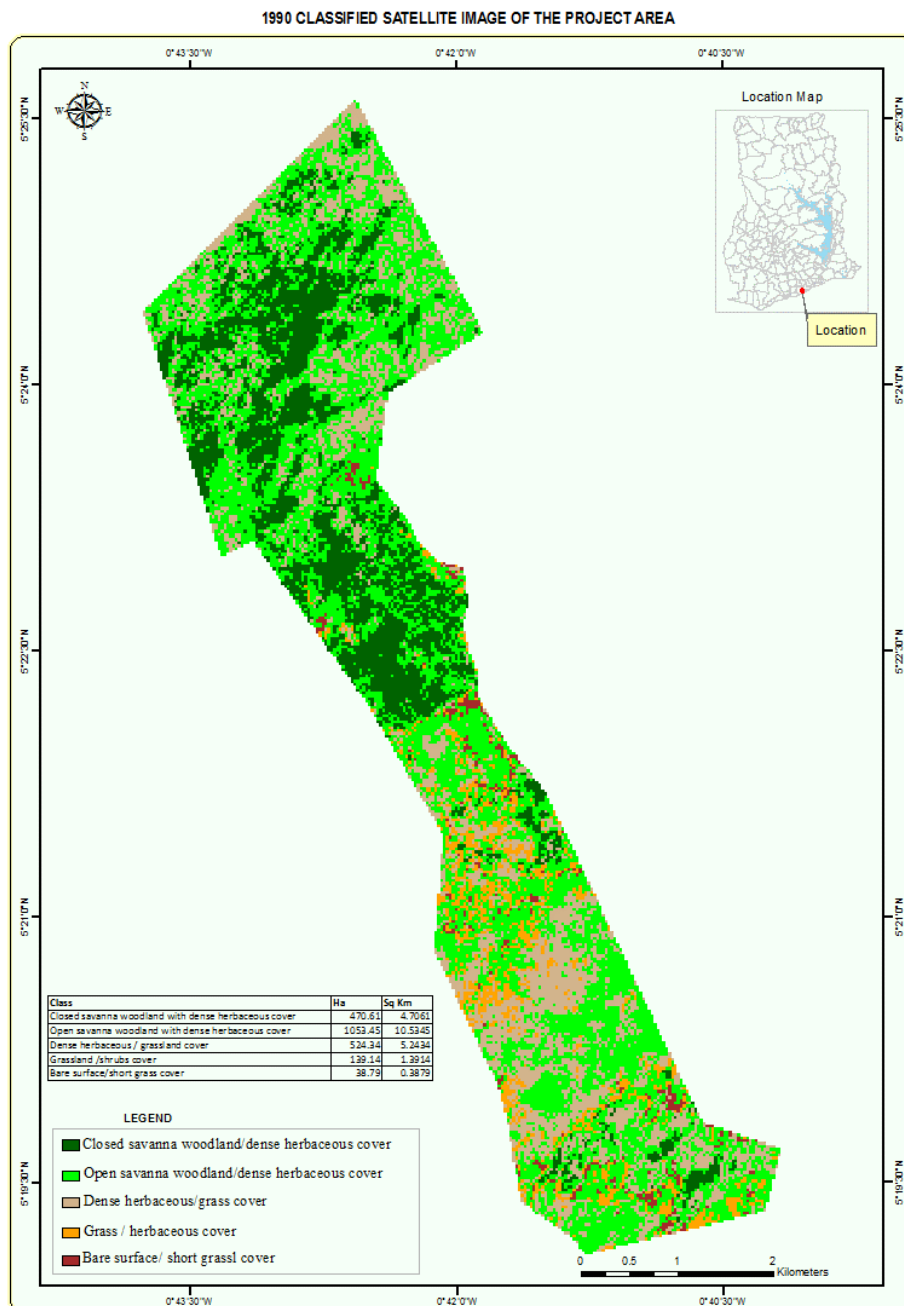


Figure 2: Map of the project area in 1990 depicting the nature of the forest cover

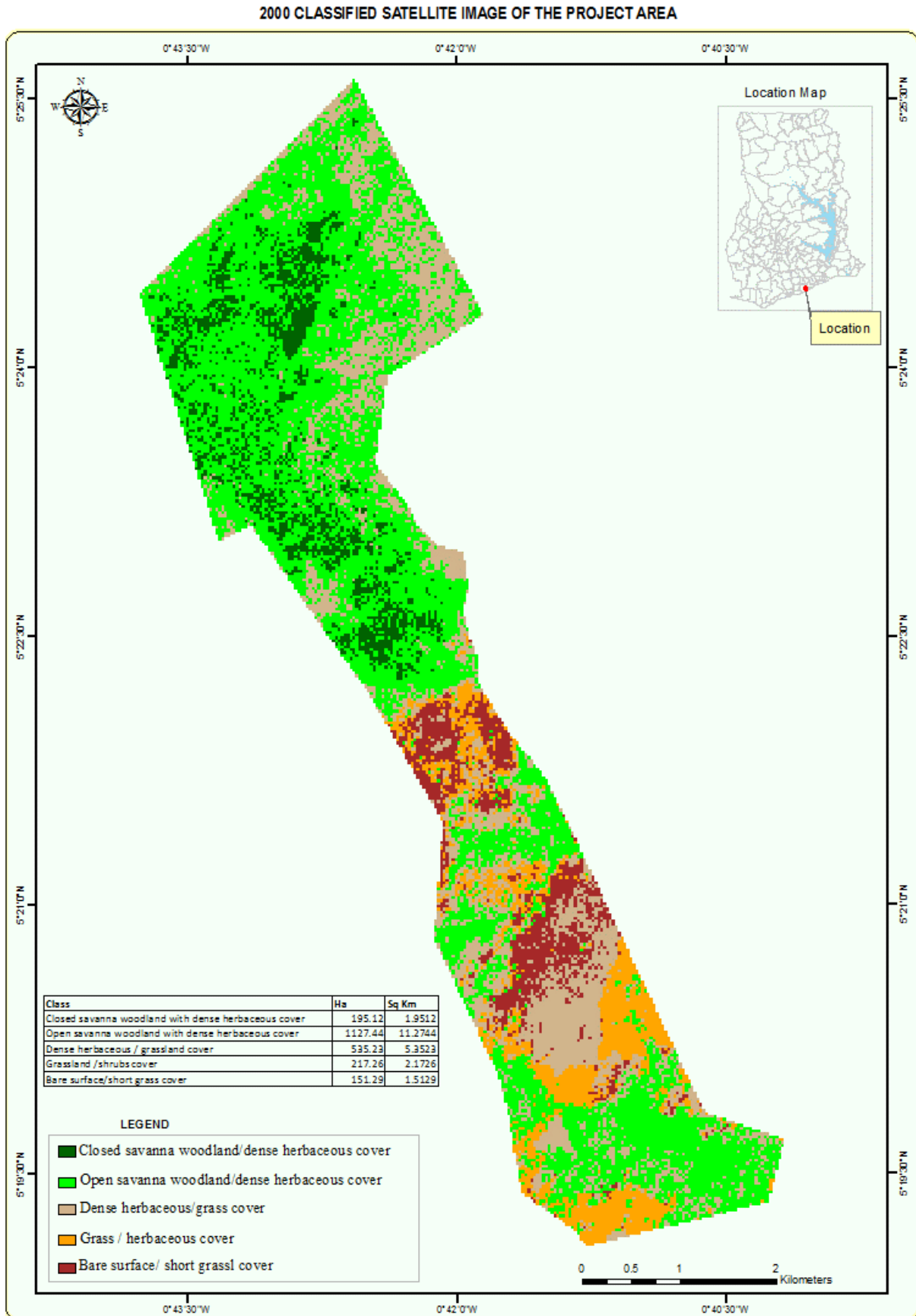


Figure 3: Map of project area in 2000 showing changes in forest cover since 1990

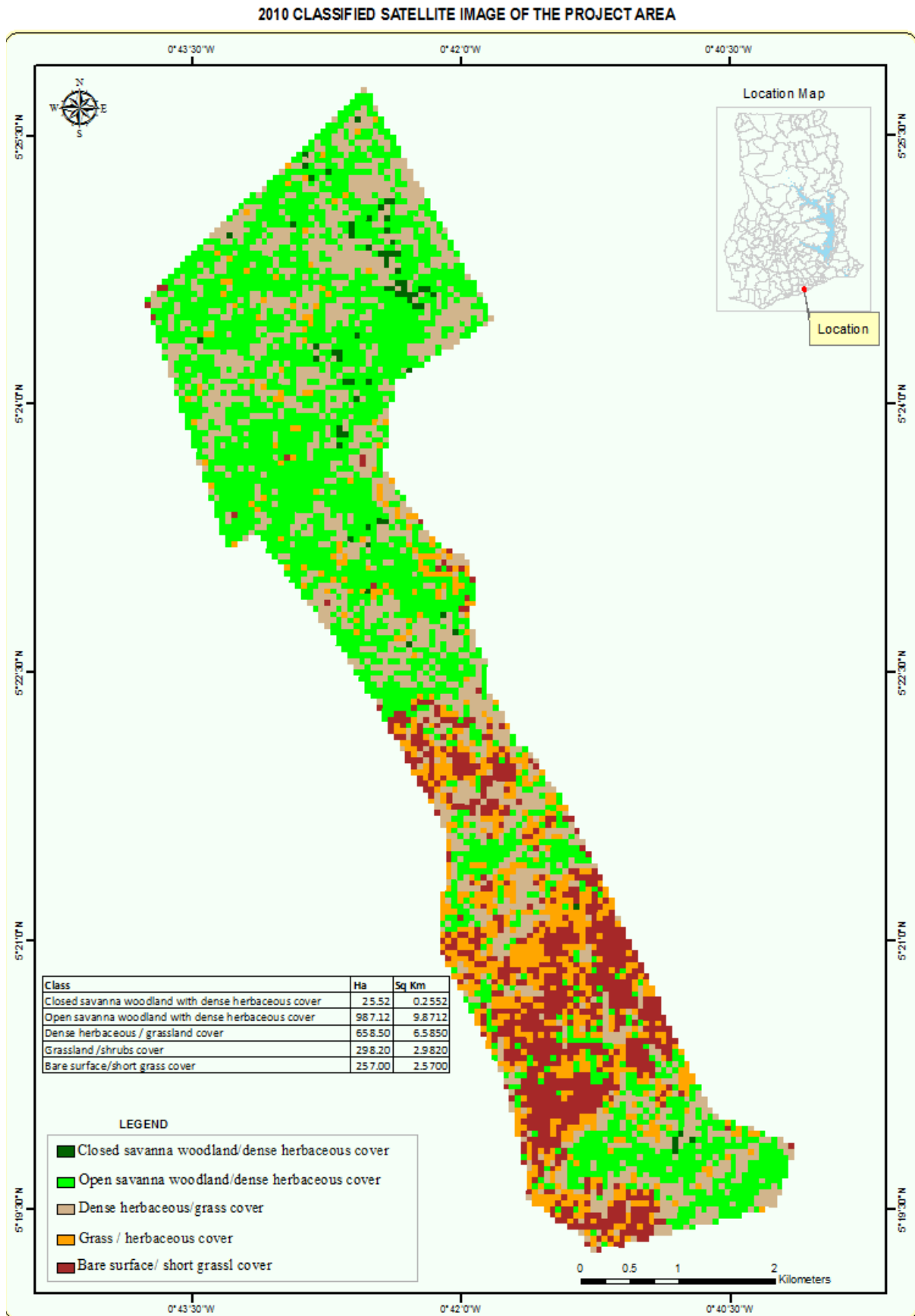


Figure 4: Map of project area in 2010 showing changes since 1990

The general implication is that the natural forest cover is ever dwindling and this according to the study may possibly be due to over exploitation of forest resources, encroachment for farming and wildfires. However, records at the District Forestry Office indicate that a total of 171.23ha was planted through the MTS by the fringe communities in the reserve between 2002 and 2009 with various tree species such as cedrella, cassia, teak, Mahogany and ceiba. The implication here is that most of the plantations have failed over the last five (5) years when the programme was stopped. The failure may be due to wildfire outbreaks, inadequate rainfall or poor supervision and maintenance by the Forest Services Division and the fringe community farmers respectively.

Local People's Level of Knowledge About Climate Change

Some respondents indicated that they are aware of the climate change phenomenon through Community Education by the Forest Service Division Office at Winneba. They recounted the effect of Climate Change to be excessive heat from sunlight, drought, variability in rainfall patterns and the effect of sea waves from salt water along the coast which has resulted in corrosion of metallic roofs and damage to buildings. They indicate that salt from sea waves might also be the cause of plant diseases and death in the forest area. It is evident from records at the Winneba Forest District office that most of the trees in a 16.0ha plantation of teak were attacked and killed in 2011 at the Bewadze portion of the reserve by an unknown cause but no research has been conducted yet to find out the actual cause.

A few of the respondents however, attributed the causes of climate change to the "making of God" who has promised that drastic changes may occur towards the end of man's existence on the earth.

Community Perception on Challenges of Sustainable Management

The respondents are aware that the forest reserve protects the environment in which they live and provide them with many products and hence the dire need to protect the reserve. They also conceded that they as fringe communities are in part responsible for the degradation of the forest. However, they indicated that they do not have enough land for farming outside the reserve. Again, infrastructure development and expansion of their communities as population growth increases has also taken part of their previous farmlands which hitherto were close to settlements. There are no encroachments for buildings in the reserve yet. Majority of the respondents expressed their willingness to work with the Forest Services Division in the protection, development and sustainable management of the reserve. This they said could be in the form of Community Forest Committees to protect against illegal forest activities. They reiterated the fact that there used to be Community Forest Committees between 2003 and 2007 but collapsed

due to lack of incentives to protect the forest.

The respondents also realized major challenges which force them into the forest as lack of employment leading to inadequate household incomes, hunger, inability to pay for education and health facilities and low crop yields on off-reserve farmlands. They accepted that the reserve is the property of stool land owners and the communities and that the Forest Services Division holds the forest in custody for its sustainable management and conservation, for the benefits of all segments of society.

Respondents' Suggested Actions to Address Sustainable Forest Management

The respondents suggested ways to improve sustainable management of the Yenku Forest Reserve through collaboration with holistic community involvement in all aspects of forest protection, development and management. They suggested intensive all year community education by the Forest Service Division (FSD) with particular emphasis on the importance of forests and the consequences of deforestation and forest degradation to present and future generations, especially in schools and at social gatherings. They accepted the fact that law enforcement by Forest Services Division (FSD) and punitive measures may deter people.

They however, suggested alternative measures to revisit land allocation to communities for agroforestry programme and suggested that there must be frequent visits to the community by Forest Service Division (FSD) to deter people from entering the reserve. The work of the Forest Services Division is however, not to deter people but to work in collaboration with the communities and civil society to enhance forest protection and productivity in the national interest.

The respondents also suggested timely benefit sharing of the established plantations under the MTS from 2002 to 2009 by the communities and FSD. The study indicates that agreement have been signed with the stool land owners but yet to be signed by the government representatives to make it operational. The major hindrance is that farmers failed to maintain the plantations as part of their commitment hence the operations cost such as weeding, climber cutting, protection and patrols were borne by the Forest Services Division and this needs time for discussions on the agreement which had already been signed.

They also suggested that felling permits and plantation quotas be granted by Forest Services Division to community groups to extract wood for charcoal production to generate income in at least those plantations they established with Forest Services Division and future plantations. They lamented that they do not benefit from outside contractors who are often given permit to operate in the area. The respondents also suggested alternative livelihoods such as grass cutter, pig and sheep rearing and the use of drought resistant food crops as part of future incentives in forestry projects in the area.

The respondents also suggested that Forest Services Division should train them in NTFP cultivation outside forest reserve and also streamline permits for NTFP collection from the reserve to avoid illegalities. The study however, revealed that people simply do not collect permits for want of money to pay permit fees.

Discussion of Findings

The discussion of findings of this research for the purpose of clarity was done on the major challenges to sustainable forest management in the Yenku Forest Reserve. These were community agroforestry programme in sustainable forest management, unsustainable, unregulated and illegal harvesting of NTFPs, communication, education and public awareness in sustainable forest management.

Agro-Forestry and Community Livelihoods in Forest Management

The numerous benefits that trees provide can be sustained in productive landscapes by integrating them into agricultural systems – a practice known as agroforestry. Agroforestry is defined as “a land-use system in which woody perennials (trees, shrubs, palms, bamboos) are deliberately used on the same land management unit as agricultural crops (woody or not), animals or both, either in some form of spatial arrangement or temporal sequence” (ICRAF n.d.).

Farmers have practiced agroforestry for centuries. Agroforestry focuses on the wide range of working trees grown on farms and in rural landscapes. Among these are fertilizer trees for land regeneration, soil health and food security; fruit trees for nutrition; fodder trees that improve smallholder livestock production; timber and fuelwood trees for shelter and energy; medicinal trees to combat disease; and trees that produce gums, resins or latex products. Many of these trees are multipurpose, providing a range of benefits. As a considerable environmental benefit, agroforestry landscapes have higher biodiversity per unit than agricultural landscapes, and they offer habitats to numerous rare species. The gradual, mosaic-like interfaces between forest and agricultural land offer a wide range of different habitats. The use of a balanced population of predators controlling pest outbreaks is one key element of the benefits of agro-forestry, e.g. in combination with organic farming.

Agro-forestry contributes to human well-being through a number of ways: by providing additional income, by increasing food security through a higher diversity of agricultural products (e.g. fruits, nuts, medicinal plants and edible oils), by providing fuelwood and construction material and thus reducing deforestation, and by stabilizing soil and water tables. Agroforestry can contribute to gender equality and equitable sharing of biodiversity benefits by providing negotiation support for women and rural residents when negotiating land use rights. It increases accessibility to medicinal trees, in particular for the rural poor (e.g. the majority of Africa's population uses trees and shrubs as their main source of

medication). It also provides a buffer against expected impacts of climate change by increasing the diversity and resilience of agricultural landscapes. Many of the trees used in agroforestry systems are multipurpose, providing a range of the above mentioned benefits. This is similar to the findings by Akponikpe *et al.* (2010), where farmers believed that climate change started 15 years ago in Ghana

Unsustainable, Unregulated and Illegal Harvesting of NTFPS in Forest Management

Non-timber forest products (NTFPs) and other forest ecosystem services are largely omitted from government development strategies. This is unfortunate, as NTFPs and forest services such as medicinal and food plants, clean water, rattan, bushmeat and bamboo play an important role in rural livelihoods and local and national economies, and yet are mostly under-represented in development strategies and in national databases (SCBD 2008). The omission of NTFPs from government development strategies and policies makes them more susceptible to unsustainable, unregulated and unauthorized harvesting, of such products from the forest.

Local empowerment of resource users is a potential key strategy to achieve long-term sustainability. However, the transfer of rights has to be coupled with the transfer of responsibility for the conservation of the resource, in accord with the resources' characteristics (e.g. biodiversity) as a national and global good. At the same time, one cannot credibly transfer rights to NTFPs to local communities without addressing rights to other resources such as timber and mining products. No universal solutions exist to solve the problem of unsustainable NTFPs harvesting in tropical forests. Approaches must be nation, site and context-specific, based on a detailed knowledge of biodiversity patterns and the ecology of the flora and fauna species, and be tailored to local cultural, socioeconomic and political conditions (Nasi *et al.* 2008).

Communication, Education and Public Awareness in Sustainable Forest Management

One of the core principles of Sustainable Forest Management (SFM) is that it reflects a diverse range of societal values in reference to forest conservation and use. For this reason, the active and informed participation of communities and stakeholders affected by forest management decisions is critical to the credibility and sustainability of management processes. Public awareness raising and communication activities play a critical role in informing and educating the public, thereby allowing them to more effectively participate in SFM decision-making (Hesslink *et al.*, 2007).

SFM requires the support at varying times and places from different government departments, NGOs, indigenous and local communities, business and industry, scientists, women's groups, youth, and community-based groups. To work with these different groups, communication, education and public awareness (CEPA) are crucial instruments to build trust, understanding and shared

agreements for action and to reduce conflict. CEPA is needed to help people work together and innovate, and spread information, knowledge, values and goals. CEPA supports capacity development so that various actors can take responsibility for forest biodiversity. It should be recognized that effective public awareness raising requires a planned systematic approach to really understand the interests of stakeholders and beneficiaries. Approaches need to be tailor-made to the local context, culture and traditions of the local communities.

Summary of Findings

The nation's forest reserves have been encroached upon especially by their fringe communities. The forest, which used to preserve the diversity of flora and fauna species is increasingly reducing over the years from being closed forest or closed savanna giving way to savannization of the forest areas and desertification of the savanna areas. The remnant of the forest is also being misused and abused through poor illegal farming practices, illegal harvesting of timber and NTFPs leading to general deforestation and forest degradation that has resulted in soil erosion, drying of streams and water catchments, loss of biodiversity and an unstable environment.

The study reveals that majority of people living in fringe communities of forests are self employed, illiterate farmers and the forests are owned by stool land owners all of whom do not have effective participation in the sustainable management of forests. Again, most of the people have problems with their economic activities such as inputs for farming outside forest reserves because of land hunger and poverty. People in the fringe communities of Yenku Forest Reserve encounter the forest estates in their normal life situations in the course of their daily business such as farming, charcoal production and collection of NTFPs and that, products from the forest cannot be obtained outside the forest reserve. The findings suggest that there is the need to protect and conserve biodiversity from over exploitation in the forest.

Furthermore, local people are aware of laws relating to the use of forest as well as effects and consequences of deforestation and forest degradation and climate change. Such knowledge was acquired through the Forest Services Division. The study also identified the need for local communities, Forest Services Division, National Fire Services, Non-governmental organizations, civil society groups, District and Municipal Assemblies and other stakeholders to join forces to protect and conserve forest reserves through mobilization, education, sensitization, awareness creation, fire prevention, boundary maintenance, monitoring and patrols to check illegal entry into forest reserves.

The findings also reveal that the Forest Services Division, District/Municipal Assemblies, local fringe communities and stool land owners should collaborate with government to develop and manage the forest on sustainable basis in areas of natural and artificial regeneration, tending

and harvesting, Social Responsibility Agreement (SRAs) involving timber firms, accountability, transparency and the fair and equitable sharing of forest revenue to reduce the challenges of sustainable forest management in Ghana, generally and the Yenku Forest Reserve in particular.

CONCLUSION

Data was collected to find out how human activities influence sustainable management in the forest and help improve the management of the reserve and the living standards of the local fringe communities. There is therefore the need to find out how to sustainably develop and manage the forest in order to leave future generations and its communities with richer, better and more valuable forestry and wildlife endowments than the present generation inherited. Local forest, communities use forests because they have a diffused idea about who actually owns the land. Communities believe that forests are ever present and belong to all Ghanaians; hence, people enter the forest as their own, with their activities leading to depletion and misuse of forest resources.

Illegal harvesting of NTFP, charcoal production and farming and other activities take place in the forest albeit the people's knowledge of forestry laws and regulations regarding the use of forest resources. Some community members stress that the laws relating to the forest should be enforced, offenders prosecuted and proceeds and inputs in the offence seized. Decision-making in the protection development and sustainable management of the forest and wildlife resources as gathered from respondents should engender the active involvement of local fringe communities as enshrined in the Ghana National Forest and Wildlife Policy of 1994. This will help maintain life-sustaining systems within natural ecosystems, preserve scenic areas, enhance the potential for recreation and ecotourism, and create income-generating opportunities to reduce incessant pressure on the forest.

Recommendations

Following the findings of this research, a number of recommendations are made.

All stakeholders, including local communities, government, and the Forestry Commission, should come together with the aim of agreeing on equitable policies regarding access to, and utilization of, the forests. It is important that communities be involved in the decision-making process, hence their needs and livelihoods-which depend on the forest-are supported while the forest resources are managed on a sustainable basis for the long term. Productive initiatives outside the forest should be encouraged through training and education on alternatives like agroforestry, improved farming practices and tree plantations. This aims to gradually reduce dependence on forest products and allow regeneration.

Training and education programs need a balanced, participatory approach involving all affected groups from public and private sectors. It will consolidate learning

through the use of local experts and case studies. Income generated from selected forest products can be used to finance initiatives like infrastructure, incentives for efforts on the protection of forests, education on conservation and alternative livelihoods. This would benefit local communities while protecting forest resources.

Chiefs, communities and other stakeholders should actively participate in decision making around forest use, management strategies and project planning to implementation. This ensures their needs and perspectives inform policy, while they also gain understanding of objectives and skills like planning, monitoring and accounting. Community involvement in governance and capacity building aims to achieve balanced, mutually agreeable and transparent management of forest resources over the long term.

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