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Kindlers of Deforestation in WA West District, The Case of Tanina Community

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Abstract:

The protection of the environment is important to the development of humanity, socially, culturally and economically. However, due to inadequate appreciation for the environment there is a horrid degradation of the environment worldwide. Deforestation rate is predicted to remain high and probably increase in the coming years as population grows especially in rural communities where life is connect to the forest as a means of survival. Ghana is not exempted from the negative impact of deforestation. With an original forest cover of 8.2 million hectare drastically reduced to about 1.7 million hectares. Finding out the factors accounting for this drastic rate of lost has been the purpose of this study in Tanina in the Wa West district of the Upper West region of Ghana where deforestation is highly prevalent.

This study focused on 199 respondents whose views and responds were documented using observation, focus group discussion, questionnaires and interviews in a mixed method approach.

Findings from this study revealed that over 60% of lands in Tanini have been destroy through charcoal burning, and crude farming methods, a situation that has resulted in the loss of economic and medicinal trees. Water bodies have dried up with poverty levels soaring among farmers who depend on farmlands to make ends meet.

Massive community based sensitization; alternative livelihood sources and enactment of byelaws to crumb deforestation menace in Tanina are among recommendation made.

Keywords: *Deforestation, Climate Change, Alternative Livelihood Gender*

1. Background

Deforestation is a disastrous creeping phenomenon in most countries thereby leading to massive global attention in recent times. Twenty percent of all greenhouse emissions annually are strongly link to deforestation (Dotse, 2009). As a result, institutions, agencies, governments and Non-Governmental Organizations (NGOs), as well as environmentalists have increasingly been campaigning and awakening people to the dangers and aftermath effect of deforestation to biodiversity and humanity in general.

Globally, as estimated by the Food and Agriculture Organization (FAO, 2010) about 13 million hectares of forest has been lost yearly in the past decade. It had been established that the permanent and rapid loss of forest areas in Africa is representing the highest percentage of any region particularly between the 1980s, 1990s and early 2000s (FAO, 2006). However, report from the European Commission, 2010 report, revealed that the continuous progress towards sustainable forest management in Africa appears to have been limited in the last fifteen years. Yet, there are some indications that net loss of forest area has slowed down and that the areas of forest designated for conservation of biological diversity has increased slightly.

The rate of deforestation especially in sub Saharan countries has reached a frightening proportion. Ghana for example has lost over 80% of her forest cover in the last century. An original forest cover of 8.2 million hectares has been drastically reduced to about 1.7 million hectares with two thirds of the country already classified as savannah woodland. Ghana's estimated deforestation rates currently stands at 135,395 hectares per year. The rate of degradation, according to (Abban, 2009) points to a gloomy future for the country's forest.

Factors accounting for the rapidity in deforestation are enormous and varies geographically. Although increasing agricultural production has been identify as the key kindler of deforestation in Saharan Africa, these kindlers vary regionally and change over time (Rudel et al., 2009; Boucher et al., 2011). Unfortunately, analyses of such kindlers have largely been base

on assessments on the continental and global scales with less focus on the local level where kindlers like charcoal production, farming and bush burning are fundamental factors believed to be triggering deforestation.

2. Problem Statement

Deforestation can play a role in both global warming and cooling. It leads to reductions in biodiversity, disturbs water regulation, and destroys resource base and livelihoods of many of the world's poorest (Williams, 2003). Over the last century, the forest cover around the globe has significantly reduced thereby leaving the green cover down to an all-time low of about 30 per cent. An estimated 18 million acres (7.3 million hectares) of forest is lost each year (FAO, 2015). Deforestation rates remain high and will probably increase in the coming years as the population grows and demand for new settlements, wood for construction, fuel wood, charcoal and food increases consequently (Amisah et al, 2009).

Ghana is not an exception on deforestation; with the three northern regions (Upper West, Upper East, and Northern Region) leading the front as far as deforestation and its implications are concerned.

Charcoal production, farming and bush burning are fundamental factors that are triggering deforestation in the three regions of the North especially in the Upper West Region. The region is bedeviled with galloping deforestation and its resultant effects. Such is the situation of Tanina community in the Wa West District of the Upper West Region, where deforestation is on the ascendance. This study was therefore carried-out, to unearth the factors accounting for the community's sharpening rise in deforestation and its aftermath effect on the lives of the people as well, as how best remedies can be prescribe to ameliorate the menace.

3. Research Questions

- How are the major kindlers of deforestation in Tanina community?
- What are the effects of deforestation in Tanina community?
- What are the measures to reduce deforestation in Tanina community?

4. Research Objectives

- To ascertain the major kindlers of deforestation in Tanina community.
- To assess the effects of deforestation in Tanina
- To recommend measures to reduce deforestation in Tanina community

5. Relevance of the Study

This study is to add to existing knowledge in literature on factors influencing deforestation in Sub Saharan African especially Ghana and for that matter Upper West Region. This study will also be of help to researchers, policy makers and governmental agencies such as the Forestry Commission, Ministry of Land and Natural Resource, and the Environmental Protection Agencies with valuable information to enhance policy guidelines and procedures that will help sensitize communities on deforestation, not only in Tanina but also in the entire three northern regions of Ghana and the nation as a whole. The findings and recommendations from this study can be use as reference on mapping up strategies and plans by the local authorities and non-governmental organization in helping mitigating deforestation.

6. Research Methodology

6.1. Study Area

The study was conducted in Tanina in the West District of the Upper West Region of Ghana. Tanina is a predominant farming settlement on the Wa-Bole truck road, about 30 kilometers from Wechiau, the district capital of Wa West District and 20 kilometers to Wa, the Upper West regional capital (Wa West Assembly 2012) Figure 1. Shows the map of Wa West district.

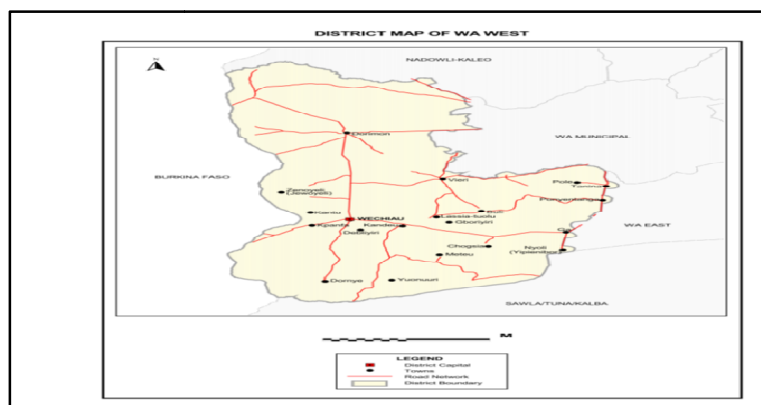


Figure 1: Map showing the study District and study community. (Wa West District, 2012)

6.2. Research Design and Approaches

This study employed both qualitative and quantitative approaches due to the complexity associated with social science (Creswell, 2009). Specifically, survey research approach was adopted to investigate into the kindlers of deforestation. According to Bryman and Bell (2003), survey research approach is data collected predominantly by questionnaire or interviews on more than one cause and at a single point in time. This survey research is invariably concerned with generalizing findings to larger population by using simple random to enhance the representativeness of the sample. Based on this, data was collected using interview guides, and both structured and semi-structured questionnaires to elicit the required responses. This ensured that all respondents' views and thoughts as well as figures and tables comprehensively captured.

6.3. Study Population

The target population was Tanini community members from eighteen years and above. The Assembly member, District Forestry Department Officer and District Director for Agriculture were also part of the study population because of their level of knowledge regarding the subject matter. This population represents actors who are directly or indirectly involved in deforestation in Tanina.

6.4. Sample size

The sampling frame of Tanini representing adult population stood at 664, out of this frame, a sample size of 199 were selected using the Rule of Thumb method. This method was use because; the sampling frame had less than one thousand people. Hence, 30% out of the 664 was settle on due to time and resource constraints.

The calculation below shows how the sample size of one hundred and ninety-nine respondents was derived.

$$\text{Sampling frame} = 664. \text{ Sample size} = \frac{30}{100} \times 664 = 199.2 = 199$$

Therefore, the sample size = one hundred and ninety-nine respondents.

Out of the total sample size of 199, 170 were farmers and charcoal burners, 5 were custodians of the land, 8 were petty traders and 16 were civil servants and government officials whose views were alsosought. This representation provided clear and holistic views from all the stakeholders.

6.5. Sampling Techniques

In finding respondents with in-depth knowledge on the subject matters, such as: the Chief and elders of Tanina, assembly and unit committee members, petty traders, civil servants and government officials in the community, purposive sampling was deployed as a non-probability sampling technique to gather all in-depth data. This technique helped us in organizing three focus group discussion as well as key informant interviews. Simple Random Sampling, which is a probability technique, was use to also collect information from the rest of respondents as a means of giving all members of the community equally chance of being interviewed.

6.6. Sources of Data

The study made use of primary data from the field. This data were glean using tools such as:

- *Questionnaire:* Open and Close ended questions were administered to respondents through a questionnaire guide. This aided in getting data, which were processed in arriving at our final conclusion. Those who could not read or write were guided in answering the questionnaires.
- *Focus Group Discussion:* During the focus group discussion, focus guide was use in soliciting the views of identified group and individuals such as the chief and assembly members amongst others who were n group of 6-12 per session.
- *Observation:* Both participants and non-participants observation was used in getting first hand idea on the level of destruction and to identify visible triggering factors of deforestation in Tanina.
- *Interview:* Structured and unstructured interviews were conducted to pick up data from respondents. Key informant interview was also conducted through a face-to-face interaction with the honorable Assemblyman of Tanina, Chief and elders as well as directors of both MoFA and forestry Commission of Wa West.

Secondary data from articles and report of various departments and government agencies as well as the internet were source in buttressing findings from the field.

7. Conceptual Review

7.1. Deforestation

Deforestation, according to Van Kooten and Bulte, 2000, is the conversion of forest to an alternative permanent non-forested land use such as agriculture, grazing or urban development. Larry West (2017) also defines deforestation as the loss or destruction of naturally occurring forests, primarily due to human activities such as logging, cutting trees for fuel, slash-and-burn agriculture, clearing land for livestock grazing, mining operations, oil extraction, dam building, and urban sprawl or other types of development and population expansion. From the above definitions, it can be realize that deforestation is primarily due to human activities such as logging, cutting of trees for fuel and clearing of land for agriculture purposes. Succinctly, deforestation can be define as the indiscriminate cutting or over harvesting of trees for a number of reasons such as

for agriculture, construction or various human activities. Deforestation is a major concern for many developing countries because of the speedily rate at which tropical forest are being depleted resulting into massive loss of biodiversity and enhancing the greenhouse effect. Globally, world annual deforestation is estimated at 13.7 million hectares a year, equal to the area of Greece. The destruction of such vast quantities of forestland will no doubt have disastrous consequences in the future, especially considering that fewer trees will result in a smaller intake of carbon dioxide, adding further emissions to the enhanced greenhouse effect. (Nadia, 2014).

Ghana developed her National Environmental Action Plan after the Rio Earth Summit in 1992, on which the National Environmental Policy was base. It is reveal, that Ghana has loss approximately US\$54 billion through the loss of biodiversity due to deforestation and land degradation. This amount is equivalent to about 40% of national GDP, and is comparable to the country's annual economic growth (Ministry of Science and Environment, 2002). It is further estimated that over 60 % of the total area of forest, have been illegally encroached by human disturbances like agriculture expansion, mining, and timber extraction (ITTO, 1993; Ministry of Science and Environment, 2002

7.2 Effects of Deforestation

7.2.1. Water and Soil Resources Loss and Flooding

Deforestation also disrupts the global water cycle (Bruijnzeel, 2004). With removal of part of the forest, the area cannot hold as much water creating a drier climate. Water resources affected by deforestation include drinking water, fisheries and aquatic habitats, flood/drought control, waterways and dams affected by siltation, less appealing water related recreation, and damage to crops and irrigation systems from erosion and turbidity (Anon., 1994a; Bruijnzeel et al., 2005). Urban water protection is potentially one of the most important services that forest provides (Chomitz et al., 2007). Filtering and treating water is expensive. Forests can reduce the costs of doing so either actively by filtering runoff or passively by substituting for housing or farms that generate runoff (Dudley and Stolton, 2003). Deforestation can also result into watersheds that are no longer able to sustain and regulate water flows from rivers and streams. Once they are gone, too much water can result into downstream flooding, many of which have caused disasters in many parts of the world. This downstream flow causes soil erosion thus also silting of watercourses, lakes and dams.

7.2.2. Economic Losses

The tropical forests destroyed each year amounts to a loss in forest capital valued at US \$ 45 billion (Hansen, 1997). By destroying the forests, all potential future revenues and future employment that can be derive from their sustainable management for timber and non-timber products disappear. In Ghana, poverty where is endemic in the rural areas. It is estimated that over 70% of Ghana's poor live in the rural area (Apusigah, 2006). It is also the case that food crop farmers in the country have the highest incidence of poverty, constituting about 59% of the poor in Ghana (Government of Ghana, 2002; EPA, 2005b). Deforestation, soil erosion, bush fires, resulting in poor rains, infertile soils, and dying up of water bodies have brought about poor crop and animal production, wood shortage and inadequate water.

7.3. Measures to Reduce Deforestation

In recent decades, the need to halt deforestation and forest degradation and promote sustainable forest management has received much attention. Though approaches on the subject are varied, the underlying principles remain the same - the conservation and sustainable use of forest resources (Marfo, Danso & Nketiah, 2013).

It appears though there are no easy solutions to the problem of deforestation and as FAO (2012) noted, the kindlers of deforestation and forest degradation are deep rooted both inside and outside the forest sector, meaning it may have local, national and global implications. Thus, to begin addressing the problem of deforestation, a deep down analysis is crucial in order to evaluate the impacts at all levels, but more critically on local communities. Competing, socio-economic factors land uses, and commercial interests driving deforestation and forest degradation involve different authorities and stakeholders. Thus, careful, conscious and committed analytical assessment of drivers should ensure the full and effective participation of all stakeholders (FAO, 2012). This can be facilitated by establishing collaborative efforts or using existing information-sharing platforms like radio and community durbars. The FAO (2012) cautioned that in facilitating the process, care should be taken to ensure the informed and meaningful participation of all stakeholders, including indigenous peoples and forest-dependent people, and that gender representation is considered.

Whatever approach is used, there is the need to coordinate policy implementation between the forest sector, environment, agriculture, rural development and other sectors relevant in a specific country. This is especially necessary in the case of countries such as Ghana, where the forests of some communities play a major role in the livelihoods of households and are not necessarily important for providing exportable timber (Marfo et al., 2013)

8. Analyzing the Kindlers of Deforestation

8.1. Socio-Demographic Data of Respondents

The sex of respondents was necessary in the study because both sex in one way or the other engage in activities that result in deforestation. Since sex also have some influence in the kind of socio economic activity carried out which may adversely have impact on the environment, it is crucial in this study to give both sex equal chances to respond to the interview schedules. Table 1. Shows that, out of the total number of 199 respondents, 67% were males and 33% were females. This is evident from the fact that mostly men carry out farming, logging and animal rearing in the Northern part of Ghana. It was found out that majority of respondents (51%) were also within the age group of 18-39 as shown in table1, followed by 40-60 representing 34% and 61+ representing 15% of the respondents.

The age of respondents was important in this study because it was to determine the active group whose activities have serious impact on the environment. Since age goes with work force, the more active age group engage in any form of deforestation the higher the land loses its fertility.

Respondents characteristics	Frequency	Percentage%
SEX: Male	134	67
Female	65	33
<i>Total</i>	199	100
AGE: 18-39	101	51
40-60	68	34
61+	30	15
<i>Total</i>	199	100
EDUCATION: Primary	10	5
JHS	124	62
SHS	27	14
Tertiary	18	9
None	20	10
<i>Total</i>	199	100

Respondents characteristics	Frequency	Percentage %
OCCUPATION: Employed	189	95
Unemployed	100	5
<i>Total</i>	199	100
RELIGION: Islam	110	55
Christianity	9	5
ATR	80	40
<i>Total</i>	199	100
MARRIAGE: Married	150	75
Unmarried	49	25
<i>Total</i>	199	100

Table 1: Demography Characteristics of Respondent
Authors' Survey, 2017

With respect to the educational level of respondents (table 1) again revealed that, 90% of the respondents had at least acquired basic education whilst the remaining 10% of respondents does not. This confirmed the rational position of the farmers and charcoal burners during a focus group discussion and similar findings of (Apusigah,2006) that revealed that, most parents in rural communities are poor and are not able to sustain their wards in school till completion and hence they engaged in activities such charcoal burning to make ends meet.

It is also evident from Table 1. Again that, 95% of respondents was self-employed primarily as farmers. However, aside farming farmers, many engage in off-season livelihood activities such as charcoal burning during the long dry season. The off-season livelihood activities serves as income to meet daily needs throughout the year, this findings affirms (Serenje et al., 1994) on livelihood source of farmers during off-seasons, which mostly is about charcoal production and other environmentally damaging activities.

75% of respondents as against 25% were not married; the high percent of married respondents reflects increased expenditures and its resultant pressure on the environment by families to find food for consumption and for income.

8.2. Kindlers of Deforestation in Tanina Community from the Respective of Respondents

Findings revealed major kindling of deforestation as farming, charcoal burning, bush-burning, animal rearing and consistent gathering of firewood and gardening.

8.2.1. Charcoal burning

Tanina's vegetation is primarily made of scatted drought resistance trees such as shea, neem, dawadawa and baobab trees. The dominant tree species is the shea nut tree, which is the preferred one for charcoal burning.

Out of the 199 respondents, 120 asserted that, charcoal burning is the major cause of deforestation in the community simply because there is no other source of livelihood apart from farming. This finding is in line with Serenje et al., (1994) "that

many rural households do not have reliable sources of income while many people in villages adjacent to woodlands are engaged in charcoal making activities" A key informant had this to say *"charcoal burning is a major source of livelihood that has been with us for ages apart from farming. Our great grandparents were noted for their charcoal production. Charcoal burning has been accepted as a century long livelihood. The charcoal burning business/livelihood is mostly undertaken during the dry season for us to earn a living since we don't have any option when the raining season elapse and this provides economic reliefs to most of us"*

This statement was further buttressed from the field where most respondent ranked charcoal as the highest livelihood activity in the community. Poverty clearly is a key factor that forces lot of people in the community to go into charcoal burning. A proverb by another discussant explained the plight of Tanina community, he witted that *"our situation is like that of the fish called 'mimah'. The fish decides to eat its tail in order to survive during the dry season when it has no food to eat instead of preserving the whole body and die out of hunger"*

8.2.2. Farming

Globally, farming is the major source of livelihood for people especially those in rural areas of which Tanina is not an exception. The traditional way of farming especially during land preparation, involves the use of tractors for ploughing. During ploughing, smaller trees are remove; bigger trees are also cut down to provide sun light for crops. Generally, farming in Tanina does not follow modern practices. Due to the large track of lands, most farmers also find shifting cultivation, a convenient farming practice. A situation that has led to the clearing of lot of lands. It was observe that, there were no farmlands closer to the community; we found out that, most farmers shift to new land ones the old land loses its fertility. Thirty-seven respondents representing (19%) alluded to the fact that bad farming practices were the main cause of deforestation in Tanina. Farmers in Tanina are rever based on their number of acres they cultivate; hence, many resort to all manner of methods and practices like ploughing, burning and uprooting of trees just to have large flat lands for cereal cultivation, to the detriment of the environment.

According to (Wilkie et al., 2000; Amor, 2008; Amor and Pfaff, 2008) as land degrades, people are force to migrate, exploring new forest frontiers increasing deforestation. This was confirm by comment from one respondent during a focus group discussion; the respondent said, *"Farming is the main source of livelihood among us the people of Tanina community. We are mostly involved in clearing and burning of stumps as we move from one farmland to the other. Each year various households move from one farmland to another to embark on farming activity where most arable lands are deforested"*.

8.2.3. Bush Burning

It was observed from our transact walk that about two kilometers away from the community, most parts were burnt. The key informant leading the walk explained, *"Bush burning has been an annual activity which mostly occurs in the community most times but the source of the fire is unknown"*. It is believe that hunters in search for game set fire into grasses to ease their search for game. Activities of herdsmen were not rule out. We learnt that when the dry grasses are burn, they re-germinate faster for these herdsmen to feed their animals even during dry season. This self- centered perception of the herdsmen motivates them to set uncontrollable fires around which most times burn crops and acres of farmlands. This annual routine of burning grasses and plants expose the soil to direct sunshine and erosion, which promotes deforestation.

Another key informant disclosed that hunting is part of the community; hence, many attach hunting to farming. *"Our effort to hunt through bush burning has doubled in recent times to the extent that about two thirds of the total land is burnt every year because it is now difficult to come by the animals. But we cannot stop since we have developed taste for bush meat and the practice has become part and parcel of us, although we know its negative effects on our land"*

8.3. Effects of Deforestation from the Perspective of Respondents

The strive to survive through farming, charcoal burning among others has led to negative effects such as, low yield, loss of economic and medicinal trees, dried water bodies, increased poverty among others.

8.3.1. Low Yield

Farming and charcoal burning in Tanini is without consideration for the environment. This is leading to soil infertility, crop failure, and low yield, all due to soil nutrients been washed away by rain. This is because, trees and spices that could have protected the soil and its nutrients are being fell and burned either for charcoal or farming activities. As a result, household's food security has become a big problem even though; people of Tanina tediously and laboriously until the land for farming each year. This goes to confirm what Dregne, (1983) said, *"Deforestation disrupts normal weather patterns creating hotter and drier weather thus increasing drought and desertification, crop failures among others"*. This was also affirmed in a focus group discussion by a discussant that, *"in the past ten years I use to get fifteen bags of maize per acre but now I am unable if I even get five bags per then it is God. He continued, "Those days we used to harvest much that we even sell some and still feed our families but now we are struggling to feed ourselves"*. This conclusion is further confirm by 50% of the respondents who ticked low yield as the major effect of deforestation in the community.

Crops such as maize and millet, which use to yield a lot of produce for farmers to enable them to feed their families and store in barns for the lean seasons no longer, turn out with good yields and this has adversely affected the food security in the community, a trend that clearly reflects in higher incidence of poverty.

8.3.2. Loss of Economic and Medicinal Trees

Economic trees such as shea, baobab, and dawadawa trees are in abundance in the three northern regions of Ghana. It was observed that, Tanina has its fair share of these economic trees. *"Sales had been generated from shea nuts, dawadawa, and baobab among others most especially by the women,"* said one discussant. She continued by saying that *"unfortunately these days we find it difficult to get the shea nuts and other products from the forest because we have indiscriminately cut most of them to burnt charcoal, fire wood and as garden sticks."*

A herbalists in the community also lamented that, *"Due to the high deforestation, we find it difficult to get our herbs and we have to go deep in to the forest before we could get some, sometimes we don't even get because all have been cleared and now simple illness takes lives"*. This affirms Hansen (1997) assertion that, by destroying the forest all potential feature revenues and future employment disappears.

8.3.3. Increased Poverty

Poverty is mostly dominant among rural dwellers with Tanina community not exempted. According to the respondents in their quest to curb poverty through farming, charcoal burning among others, their situation has rather worsened.

An interaction with seven women who were leaders of different groups revealed that, Shea fruits had been financially supportive during the early years in marriage. The oldest among them indicated, *"We use to collect the shea fruits within the period of three months, process them into shea butter or sell them raw after we have dried them. The income generated was used to support our families but recently, the fruits are scares because most of the shea trees have been cleared and that has affected us greatly hence we are not able to provide the required nutrients for our children especially those that we do not produce and that has contributed to malnourishment"*.

Respondents attested to claims that, due to debt most farmers are force to sell their roofing sheets to defray debts for the avoidance of disgrace. *"All of this is attributed to deforestation"* a respondent exclaimed. Primarily, because farmers now invest much but harvest little as a result of the indiscriminate cutting down of trees which degrades the environment. This falls in line with a research conducted by United Nations Research Institute for Social Development (UNRISD, 2005) which indicated environmental degradation as a cause of poverty, because most farmers have no option but to clear the virgin forest. To feed their families.

8.4. Measures to Reduce Deforestation from the Perspective of Respondents

8.4.1. Creation of Awareness

The people of Tanina should be constantly sensitized on the consequences of deforestation to their lives presently and more importantly tomorrow. The use of radio should be well utilized because radio is the commonest source of communication for the community with over four radio stations situated in Wa having strong signals in Tanina. *"Extension officers as well as forestry officers in the district should pay regular visit to the community to educate us on appropriate farming methods as well as encourage us to develop the habit of planting trees so as to sustainably minimize deforestation here"* a respondent demanded. Effective participation of all stakeholders can be achieved by establishing collaborative mechanisms or using existing information-sharing platforms as a channel of creating this awareness. Due to somewhat better educational level of Tanina as present in Table 1. Where 62% of respondents have education up to Junior High School level, 9% up to tertiary and only 10% lacking formal education, it will be relatively easier for the community to comprehend and appreciate awareness campaigns of deforestation.

8.4.2. Effective law Enforcement

Creation of awareness should go hand in hand with law enforcement. The district assembly in collaboration with the forestry commission and traditional authorities should enforce environmental and forestry policy to protect and ensure sustainable land use for the current and future generations. An enactment of a byelaw such as fining those who are guilty of cutting down economic trees illegally and burning of bushes should be in place to help minimize deforestation in Tanina. These laws should be enacted in concert with all relevant stakeholders to give it the power and backing needed for implementation.

8.4.3. Construction of Irrigational Dam

A discussant disclosed that, construction of irrigation dam in Tanina could help reduce deforestation. *"Cutting down of trees for charcoal will reduce drastically because, most of us prefer to engage in dry season farming to charcoal burning"* she said. This confirmed what a key informant had earlier on said that *"we know the consequences of deforestation but since we cannot starve to death we burn charcoal therefore, we are hopeful that when we are blessed with dam, considering the low level of our land deforestation will be mitigated"*.

8.4.4. Alternative livelihood source

Alternatively providing Tanina community with other source of livelihood will help reduce pressure on their land. Aside farming there is no different source of income for the community. A concerted effort between private individuals, government and NGO's can help provide startup capital for individuals in identifiable groups to embark on business that has viable return. The proximity of Tanina to Wa municipality (regional capital of Upper West Region) as well as the major truck road passing through the community are all advantageous for business to thrive when proper measures and plans are instituted.

9. Conclusion

This study was intended to ascertain the kindlers of deforestation in Tanina community. Poor farming practices, indiscriminate cutting of trees for fuel and charcoal, and bush burning, were noted to be the major kindlers of deforestation in Tanina. This study revealed that, a total of about 18-kilometer square representing 65% out of the community's total land is depleted due to charcoal burning, improper farming methods as well as overgrazing, bush burning and consistent gathering of firewood. It also came to known from the study that poverty has been galloping for the past ten years because of low yield, which is directly link to deforestation. Dried water bodies and loss of economic and medicinal trees were other effects of deforestation revealed in Tanina. This study concludes therefore that, Tanina in the next decade will become more vulnerable with risk of total desertification if preventive measures and strategies are not in place to curb the menace of deforestation

10. Recommendation

The study brought to light the severity of deforestation and how it can ruin lives, incapacitate communities from undertaking productive ventures and latently contribute to global warming. It was further establish from this study that most of the respondents were not ignorant of the factors that promote deforestation.

They attributed the effects to poverty simply because there is no other alternative means of survival. It is therefore highly recommended that, Intensive education be carried out on deforestation. This should be done in collaboration with various stakeholders, including but not limited, to the forestry department and Ministry of Food and Agriculture and Radio Stations in Wa the regional capital. There again, government and various developmental agencies should help provide alternative source of livelihood for the people of Tanina as well as construction of irrigation dam and bye laws to crumb illegal cutting down of trees. These strategies will help minimize the effects of deforestation. It is recommended that further studies on kindlers of deforestation and its adverse effect should concentrate on the empiricism of poverty reduction especially in the rural areas.

11. References

- i. Abban, K.I. (2009). An Evaluation of Government Interventions for Forest Plantation Development in Ghana, University of Copenhagen, Published MSc Theses
- ii. Abubakari, S. M. (2014), Deforestation and its effect on livelihood patterns of forest fringe communities in the Asunafo north municipality (Master's thesis, April, 2014).
- iii. Amor, D. 2008. *Road impact on deforestation and jaguar habitat loss in the Selva Maya*. Ph. D. dissertation. Ecology Department, Nicholas School of the Environment, Duke University.
- iv. Amanor, K. S. (1999). Global Restructuring and land Rights in Ghana. Forest Food Chains, Timber and Rural Livelihoods. Research Report no. 108. 156pp.
- v. Avruch, K. (1998) Culture and Conflict Resolution. Washington DC: United States Institute of Peace Press.
- vi. Awudu, G.B. (2002), Combating desertification the Wulugu experience, friend of The Earth Ghana, Accra
- vii. Beddington J., Asaduzzaman M., Clark M., Fernández A., Guillou M., Jahn M., Erda L., Mamo T., Van Bo N., Nobre C.A.,
- viii. Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S., & Saxon, E. (2011). The Root of the Problem. What's Driving Tropical Deforestation Today? Union of Concerned Scientists
- ix. Black R. et al. (2006). In Black, Migration and Development in Africa: An Overview, Africa Migration and Development (Vol. Series 1).
- x. Bradstock, R.A., Tozer, M.G., and Keith, D.A. (1997). Effects of high frequency fire on floristic composition and abundance in a fire-prone heathland near Sydney. Australian Journal of Botany 45: 641-655.
- xi. Bremner, J., López-Carr, D., Suter, L., & Davis, J. (2010). Population, poverty, environment, and climate dynamics in the developing world. Interdisciplinary Environmental Review, 11(2/3), 112-126.
- xii. Brook B W, Sodhi NS, Ng PKL (2003) catastrophic extinctions follow deforestation in Singapore. Nature 424:420-423
- xiii. Chomitz, K. M.; Buys, P.; Luca, G. D.; Thomas, T. S. and Wertz-Kanounnikoff, S. 2007. At loggerheads? Agricultural expansion, poverty reduction and environment in the tropical forests. World Bank Policy Research Report. World Bank, Washington DC.
- xiv. Commission on Sustainable Agriculture and Climate Change. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.
- xv. DeFries, R. S., Rudel, T., Uriarte, M., & Hansen, M. (2010). Deforestation driven by rban population growth and agricultural trade in the twenty-first century. Nature Geoscience 3, 178-181

- xvi. Dove, M. R. 1993. Smallholder rubber and swidden agriculture in Borneo: a sustainable adaptation to the ecology and economy of the tropical forest. *Economic Botany* 47: 136-147.
- xvii. Dotse, S. (2009). *Underlying causes of deforestation and forest degradation: it implications for climate change*.
- xviii. Egunjobi, J.K. (1971). Savannah burning, soil fertility and herbage Productivity in the derived Savannah Zone of Nigeria, Africa. IUCN Publication Vol.22: pp. 52-58.
- xix. FAO (2005) – Global Forest Resources Assessment: Environmental Degradation and Social Integration Briefing Paper No.3 Environmental and Resource Economics 27-30. World Summit for Social Development. Ghana Forestry Commission (1994). Forest and Wildlife Policy, 1994, Forestry Commission, Accra, Pp. 1-7.
- xx. Ghana Statistical Service (2012) Upper West Region, Wa West District
- xxi. Gnado. (2004). GIA/NABIO Agro forestry development organization, GNADO Report, Bolgatanga.
- xxii. Gore, Al. (2009). *An inconvenient truth: The planetary emergency of global warming and what we can do about it*. New York: Rodale.170-195.
- xxiii. Hedwin, A.G. (2006). Climate change vulnerability and adaptation Assessment: Reports of the members of the Study team Accra, Ghana.
- xxiv. Hough J. (1993) Why burn the bush? Social approaches to bush fire management in West African National Parks. *Biological Conservation* 65: 23 – 28.
- xxv. Myers, N. 1992. *The Primary Source: Tropical Forests and Our Future*. Norton, New York.
- xxvi. Myers, N. 1994. Tropical deforestation: rates and patterns. In: *The Causes of Tropical of Tropical Deforestation. The economic and statistical analysis of factors giving rise to the loss of the tropical forest*, eds. Brown, K. and Pearce, D. pp 27- 40. UCL Press.
- xxvii. Nadia. (2014, August 31). Deforestation. San Francisco: Prezi. Retrieved from [prezi.com](https://prezi.com/xj1fczmh4bpp/deforestation/): <https://prezi.com/xj1fczmh4bpp/deforestation/>
- xxviii. Repetto, R. 1990. Deforestation in the Tropics. *Scientific American* April, p. 37.
- xxix. Serenje, W., Chidumayo, E.N., Egneus, H. and Elegard, A. (1994): *Environmental Impact Assessment of the Charcoal Production and Utilization System in Central Zambia*: Stockholm Environment Institute (SEI): Energy, Environment and Development Series no. 32, Stockholm, SWEDEN.
- xxx. Trainor C. R, and Woinarski, Jcz. (1994). Responses of lizards to three experimental fires in the savanna forest of kakadu national park. *Wildlife research* 21: 131-148.
- xxxi. United Nations Research Institute for Social Development (UNRISD, 2005) :(2005) Workshop on Environmental statistics for the ECOWAS Region – Dakar Senegal.
- xxxii. West, L. (2017, January 25). ThoughtCo. Retrieved from [www.thoughtco.com](http://www.thoughtco.com/overview-of-deforestation-1203589): <https://www.thoughtco.com/overview-of-deforestation-1203589>
- xxxiii. Wilkie, D.; Shaw, E.; Rotberg, F.; Morelli, G. and Auzels, P. 2000. Roads, development and conservation in the Congo Basin. *Conservation Biology* 14:1614-1622.