

Non-Timber Forest Products and Climate Change Resilience: The Case of the Savannah Woodlands Northern Ghana

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Abstract

The study was conducted in northern Ghana where the savannah woodland constitutes the major vegetation cover. The population is largely rural and the incidence of poverty is relatively high in Northern Ghana is relatively high compared to other parts of Ghana. The study revealed that Non-timber forest products contribute significantly to rural livelihoods by way of food, employment and income. This is, especially, significant for the poor and vulnerable. Recent trends, however, indicate that the resource base is dwindling partly due to over-exploitation and agricultural expansion. Climate change has highlighted the need to explore options to ensure a more resilient food systems in northern Ghana by way of mutually enforced agriculture and forestry sectors thereby optimizing benefits from both sectors. Consequently, the concludes by proposing a model and innovative pathways for achieving this.

Keywords: Non-timber, forests, forest products, resilience, savannah, woodland

1. Introduction

The debate on the role of forests in poverty reduction was ignited when in a special edition of the World Report Sunderland et al., 2004 drew attention to the spatial convergence of poverty and forest areas and the need to consider forests in poverty reduction strategies. At that time, the overriding concern was the rising poverty among forest dependent people and diminishing forest cover globally. The reasons are well documented: forests play a key function in the global carbon cycle, the high diversity of forests make them an invaluable gene bank for future research and development, forests contribute to the stability of global ecosystems and forests provide a rich diversity of crops that contribute to human welfare via provision of foods, medicines and cash to the rural poor. Indirectly, climate change due to deforestation is expected to impact more heavily on the poor (Sunderland et al., 2004). Today the situation has not changed much as the pace of poverty has not reduced and forests are increasingly been degraded largely to the disadvantage of forest dependent people (Wunder et al., 2014). Recent evidence, however, points to the fact that, indeed, NTFPs make significant contributions to rural economies (Angelsen et al., 2014; Ra et al., 2011). Wunder, S. et al. (2014) indicate the existence of a “significant subsidy from nature into rural economies”. In the midst of these emerging evidence Wunder et al., (2014) argue that there is the need to revisit the debate on the contribution of NTFPs to forest livelihoods.

One reason why NTFPs have not assumed a significant role in development interventions is largely due to lack of adequate quantitative data to highlight the significance of NTFPs national and local livelihoods (Belcher et al, 2005) although it is amply evident that large numbers of people depend on them for livelihoods providing critical income and food during critical times of need (Belcher, 2005). In Ghana, it is estimated that the economic value of NTFPs, for both commercial and household purposes, may locally outweigh that of timber (Ghana Investment Plan for the Forest Investment Program (FIP), 2012). Despite the growing appreciation of the role of NTFPs in rural subsistence and development, neither development research nor policy has yet fully explored the contribution of NTFPs to livelihoods in the Savannah zones of Northern Ghana. Much of their value is not formally recorded and remains inadequately represented in policy analysis. The fact that there is, currently, no reliable data on the contribution of NTFPs to the economy despite its arguably important role in the economy speaks volumes of the neglect of the sector. Such lack of national accounting has relegated NTFPs to the background in national policies all over the world. Policy intervention is clearly skewed towards the high forest zones of Ghana and largely on timber production to the neglect, especially, of the off-reserve areas. By extension, the Savannah Zones of which northern Ghana forms part is largely neglected. Available statistics indicate that only 34% of the forest reserves currently exist in the Savannah Zones. The area also accounts for the largest proportion of off-reserve areas constituting a total of 69% of all off-reserve areas in Ghana.

Information on the location of non-timber forest products[in Ghana] is very limited. No quotas are given for NTFP and other forest extractives allocation, so no public information is provided on such activities. When citizens are duly informed about extraction of forest products, they will be obliged to support the process and will not condone illegalities in the sector.

Source: Global Witness, Annual Transparency Report, 2011

One other probable reason why NTFPs have not been accorded economic significance is that most of the existing evidence on the contribution of NTFPs to local livelihoods is based on data from the tropics where income from the exploitation of timber overshadows that of NTFPs. Shackleton et. al., (2007) provide evidence to the effect that NTFPs contribute significantly to poverty reduction in dry woodlands in South Africa. This may be the case for the northern savannah zones of Ghana where large numbers of rural dwellers depend on NTFPs due to limited options for alternative livelihoods. The Northern Savannah woodlands occupy about 65% of the Ghana's total land area. With the fast dwindling forest resources NTFPs are expected to command an increasing share of forest GDP as NTFPs are widely recognized to play a very important role in the Ghanaian economy (Pouliot and Treue, 2012; Ahenkan & Boon, 2011; Appiah et al., 2009).

2. Definition of NTFPs

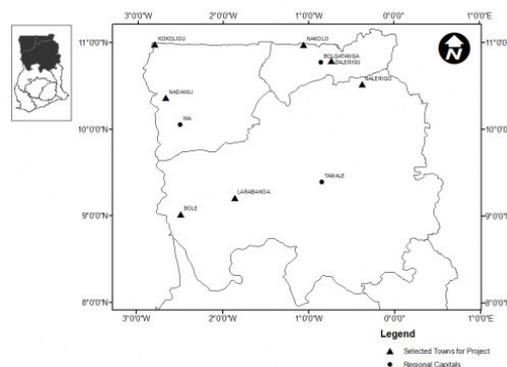
Non-timber forest products (NTFPs) are among the oldest traded commodities in the world having historical importance (Panayotou et al 1992). The definition of non-timber forest products is still a subject of debate (Ahenkan, 2011). One common feature of all the definitions despite their diversity is the congruence on the fact that NTFPs are all forest extracts excluding timber. Examples include bark, roots, tubers, leaves, fruits, flowers, seeds, resins, honey, firewood and wildlife (Sunderland et al, 2003; Panayotou et al 1992). They are collected from a wide range of ecotypes including the savannah woodlands. The Centre for International Forestry Research (CIFOR) defines NTFPs as "any product or service other than timber that is produced in forests. They include fruits and nuts, vegetables, fish and game, medicinal plants, resins, essences and a range of barks and fibers such as bamboo, rattans, and a host of other palms and grasses". They also include "wood products, such as those used for wood carving or fuel" (CIFOR, 2011). In 1995, the Food and Agriculture Organization of the United Nations (FAO) raised the term 'non-wood forest products' (NWFPs) in order to distinguish between wood products, non-wood forest products and forest services. The FAO defined NWFPs thus: "Non-wood forest products consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside the forest." (FAO, 1999). That definition implies both products from animals and plants and the species itself, but excludes strictly all woody raw materials. Referring to de Beer and McDermott (1989) timber and non-timber materials are distinguished by the level of their industrial extraction, i.e. non-timber wooden materials can be easily harvested by rural dwellers without high skills and technology requirements. Furthermore, it is unclear whether to include cultivated products (Belcher, 2003). For the purpose of this study the term 'NTFPs' is used for plant products only, as they were the main products reported to be extracted from the forest. By their nature the major forest products obtained from Savannah woodlands are NTFPs as commercial exploitation of timber is very much limited. Following Cunningham (1996) our definition of NTFPs includes all biological matter of wild plants, i.e. fruits and seeds, vegetative textures as well as various small stems, twigs as well as firewood extracted from savanna woodlands. Therefore, products from non-native, cultivated fruit trees, such as *Moringa* sp, are excluded because they are cultivated and, thus, are not equally accessible to rural dwellers. In our view, these are considered as 'crops' cultivated privately outside open or semi-open access savanna woodlands.

3. Methodology

3.1 The Study area

The study was conducted in the Northern Savanna Regions of Ghana. The definition of Northern Ghana, in the context of this study encompasses three political regions namely: the Northern, Upper West and Upper East of Ghana. Climatically, the area is relatively dry with a single rainy season. The main vegetation is classified as vast areas of grassland, interspersed with the guinea savannah woodland, characterized by drought-resistant trees such as the acacia, baobab, shea nut, parkia sp, mango and neem.

Figure 1: Map of Northern Ghana



Poverty rates remain from two to three times the national average, which is 39%. Northern is 69%;

Upper East 88% and Upper West 84%¹. The area is characterized by chronic food insecurity and is vulnerable to drought, the organization further observed, adding that life expectancy, education and health indicators are all lower in the area whilst emigration rates are high, especially among young people. Smallholder agriculture is the major activity amongst the people. Most families also collect tree products as the market for these products is growing. For instance, it said demand for shea nut grew by 25% in 2008/09, representing an export value of USD 30 million in 2010. Experts reckon this could triple in future.

3.2 Study population and sampling

The study population consists of all households in rural Northern Ghana. The study districts and communities included in the survey were chosen purposively to coincide with major tribal areas namely; Dagomba, Mamprusi, Konkomba, Sisala, Wala, Gonja and Frara. It is hypothesized that different ethnic groups exploit NTFPs differently. This, in essence gives the study a broader representative view of Northern Ghana. 351 respondents were sampled for the study. This included 167 males and 183 females.

3.3 Data collection Methods

3.3.1 Direct observation: This allowed researchers the opportunity to probe into the various uses and commercial exploitation of NTFPs.

3.3.2 Rapid rural appraisal: Focus group discussions were employed to further probe and ascertain information obtained from the questionnaires. Focus groups consisted of male and female community members with representation of the youth and elderly.

3.3.3 Key informant interview: Information obtained was complemented with key informant interviews with traders in various markets, opinion leaders and chiefs in the various communities. Representatives of relevant institutions like the Forestry Commission and Ministry of Food and Agriculture were interviewed.

3.3.4 Household interviews: Household interviews were conducted based on structured questionnaires aimed at collecting both quantitative and qualitative data to address the study objectives.

3.3.5 Market surveys: Samples of common NTFPs of commercial value were observed and collected in major market centers periodically.

4. Results and Discussion

4.1 Significance of NTFPs in Rural Livelihoods in Northern Ghana

Rural households surveyed in the Northern Regions of Ghana make extensive use of several non-timber forest products (NTFPs) for subsistence and income generation. The range and number of NTFPs exploited differs among households and communities in response to contextual factors such as resource endowment and period of availability. Parkia sp, shea and baobab are the major NTFPs exploited across the three northern regions. These are mainly used as food and for medicinal purposes.

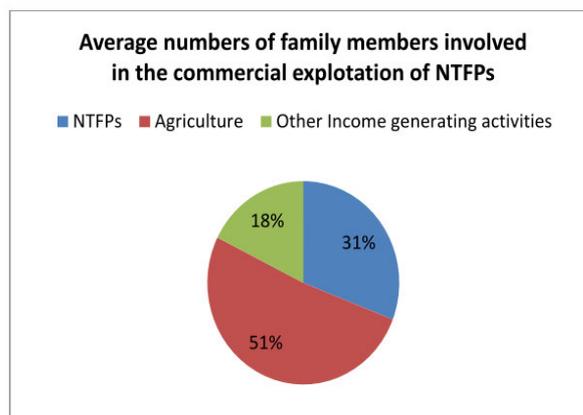
4.2 Economic Exploitation of NTFPs by Households

The average household size in the study area is about 5.3. About one-half of household members are economically active and are engaged in some form of economic activity. All households have, at least, one member engaged in the economic exploitation of NTFPs. Majority of these are women who are engaged in the gathering and selling of NTFPs notably firewood, Parkia sp, shea and baobab fruits. The majority of men who are engaged in the commercial exploitation of NTFPs are mostly involved in gathering and selling of medicinal plants, honey production and charcoal production. At least, one member of each household interviewed is engaged either in the exploitation and trade in NTFPs or both. About 2.1 members of each household are engaged in the exploitation of NTFPs constituting 31% of all household members (see figure 2 below).

¹ Ghana Living Standards Survey 2000

Figure 2: Extent of commercial exploitation of NTFPs by household members

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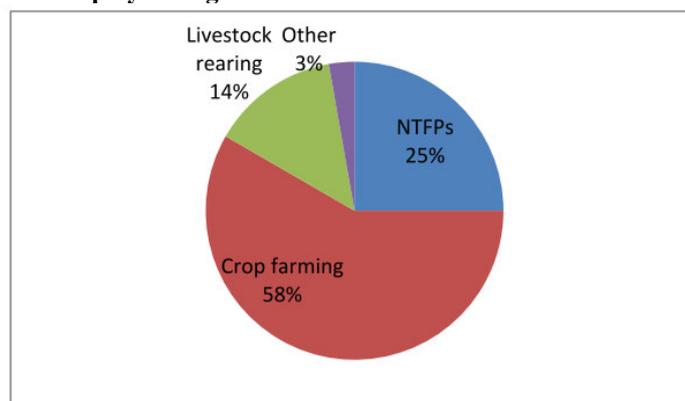


Source: Field Survey, 2012

4.3 Composition of Employment in Different Sectors

Employment in a sector is determined by the estimated number of days an individual engages in the exploitation of NTFPs, crop farming or livestock rearing proportionally within a year. As indicated in figure 3 below, the actual time spent exploiting NTFPs is 25% of the time an economically active individual spends on productive activities within the year. This is quite significant given that it comes only second to crop farming among the portfolio of economic activity engaged in by rural households.

Figure 3: Employment generated in various sectors of the rural economy

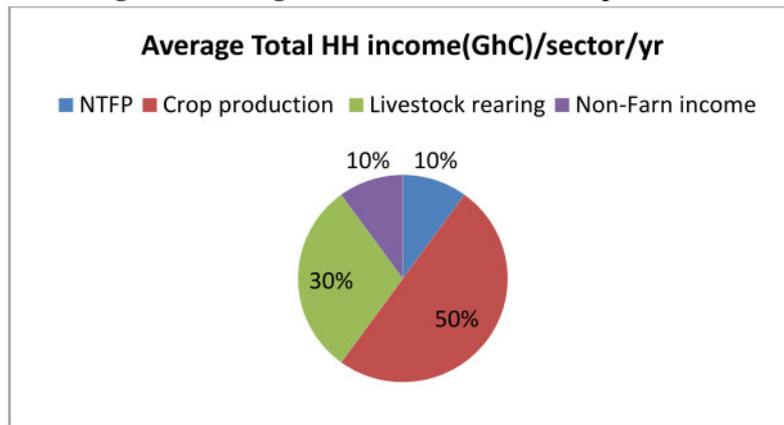


Source: Field survey, 2012

4.4 Distribution of Income from Different Sectors

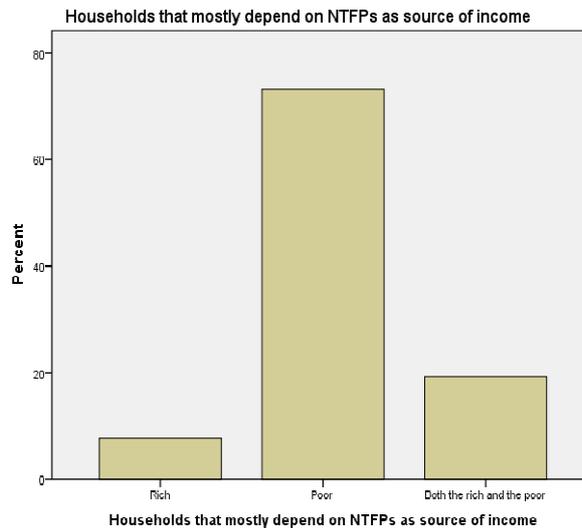
The different sources of income for households in the study area are as indicated in table 7 below. The main sources of income include exploitation of NTFPs, crop farming, livestock rearing and several other Non-farm incomes from remittance, off-farm employment and trading. The average total income earned by a household within a year is estimated at GhC 1,200. Out of this NTFPs account for only 10% while income from crop production constitutes the highest proportion of household income. The most likely reason accounting for the low contribution of NTFPs to household annual income is the fact the economic value of the NTFPs is low as most of the NTFPs are exploited and sold in the raw state with little or no value addition. Another possible reason accounting for the above situation is that NTFPs are largely sold at the farm gate by the primary producers. This places them at very disadvantaged position long the value chain as they do not benefit from the higher margins enjoyed by intermediaries higher up the chain. For instance, sheanut is sold to intermediaries at the farm gate who sometimes enjoy up 300% profit when sold in urban markets. Similarly, baobab leaves are sold fresh at the farm gate. This same leaves, when dried and converted into powder can earn profits up to 350% in urban markets. Shea nut, Dawadawa and Baobab contribute the most to rural household incomes in order of importance.

Figure 4: Average household annual income per sector



4.5 Nature of households dependent on NTFPs

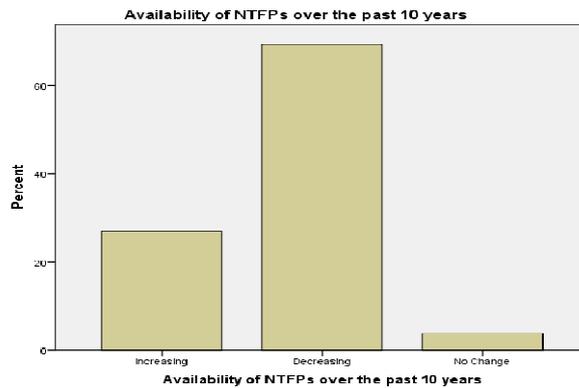
The significance of the contribution of NTFPs to livelihoods becomes apparent when its utilization is viewed in the light of the wealth status of households mostly engaged in their exploitation. As indicated in figure 5 below, it is worthy of note that poor households benefit a significantly from the exploitation of NTFPs in Northern Ghana accounting up to 30% of household incomes according to survey results.



4.6 Sustainability

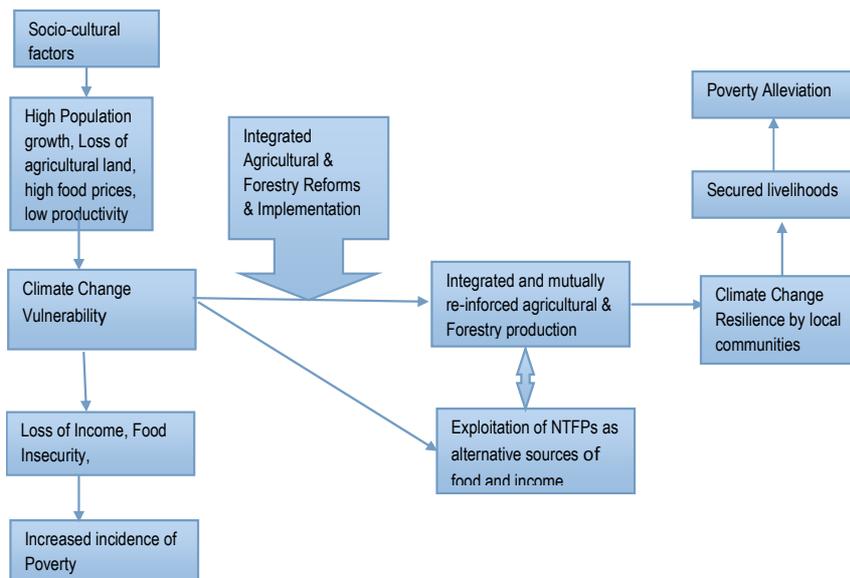
As indicated in figure 6 above, majority of producers are of the view that access to NTFPs is decreasing. While some common species are no longer available increasing distances have constrained access to NTFPs overall. On the average, the distance to harvesting zones has increased by about 3 km. Several factors have contributed to this situation including uncontrolled bush burning, over exploitation and cultivation resulting in the degradation of vulnerable ecosystems. Culturally, most communities in Northern Ghana do not plant trees under the belief that a person planting a tree will not live to enjoy its fruits.

Figure 6: Producer perception of availability of NTFPs in Northern Ghana



5. Towards a Model for Integrated NTFP and Agricultural Food System for climate change resilience

The results demonstrate the considerable economic significance non-timber forest products to rural livelihoods. They underline the importance of incorporating NTFP income into rural income accounting in studies on poverty. From the results above it is obvious that the role of NTFPs, at least, in preventing hunger and reducing poverty need to be accorded greater attention development interventions.



The effects of climate change on agricultural production in northern Ghana need not be over emphasized, as it is glaring. Late rains and intermittent droughts have become more common. This has posed considerable challenge to farmers as traditional coping mechanisms are increasingly challenged. The problem of climate change has been made more difficult by inadequate and late availability of agricultural inputs despite Government subsidy. Traditionally, NTFPs have served to secure the hunger season in rural areas of Northern Ghana. This is as true today as it was in the past. NTFPs play a critical role in ensuring both food and income security in as rural households depends extensively on the NTFPs for food and income during drought years. In the midst of such enormous challenges to food security there is the need for innovation in agricultural systems to make them more resilient in mitigating the impact of climate of climate change. In this paper, we identify two key drivers for such an innovation towards an integrated and mutually re-enforced agricultural and Forestry production. This, we believe will contribute significantly to improved resilience of agricultural systems to climate to the negative effects of climate change.

5.1 Integrated Agricultural and Forestry Reforms and Implementation

The Agricultural and forestry sectors are intricately related. This relationship has been traditionally considered antagonistic mainly through the direct competition for land between the two sectors to the extent that deforestation and forest degradation fuel agricultural development (Sunderlin et al. 2005). There is no arguing the fact that agriculture has been the most significant contributor to deforestation and forest degradation

accounting for 80 per cent of the world's deforestation over the last decade (Graham and Vignola 2011). It is obvious that going into the future the need to feed the growing population will put further pressure on forestry resources. In the context of the current challenges with climate change, however, this situation will place enormous pressure on natural ecosystems reducing their resilience and challenge the ability of food systems to meet the increasing and changing demands of large populations globally. In view of this, there is the urgent need to consider innovative and integrated approach to forestry and agricultural development. The starting point are policies that will ensure a balance, as much as possible, between ecologically efficient food production systems the optimization of land use for conservation and agriculture (Laurance et al. 2014). This calls for a collaborative effort from both sectors from technology development through to marketing. In order to focus on win-win solutions there is the need to focus on optimal trade-offs between the two sectors in order to maximize the potential of both. For instance, in Northern Ghana, what options do shea parklands offer for the development of an appropriate farming system that ensure sustainable economic exploitation of sheanut by local populations ?

5.2 Exploitation of NTFPs as alternative sources of food and income

NTFPs have been known to supplement the food and dietary needs of rural populations all over the world (Shackleton et. al, 2011). Many of these NTFPs have also been known to be rich in essential minerals and vitamins (Grosskinsky, 2000). Trade in NTFPs also allows the poorest in rural areas to have access to much needed food, especially, during times of crop failure (Shackleton, 2014). Therefore, it is time to move beyond viewing NTFPs merely as safety nets to a more active consideration as part of the food and local economy. There may be arguments to the effect that incomes from NTFPs are not significant as confirmed by B. AMBROSE-OJI(2003) for forest fringe communities in cameroon. However, this study agrees with Shackleton et. al., (2007) that the contribution of NTFPs to employment and income is quite significant in areas other than the humid tropics. Thus, the extent to which NTFPs contribute to local livelihoods is influenced by contextual factors. Consequently, the promotion of NTFPs must be targeted. Such an approach will ensure that such interventions are effective and efficient.

6. Conclusion and recommendation

The study has confirmed the NTFPs, in deed, contribute to livelihood and food needs of rural people in Northern Ghana. The world can no longer afford to continue to the interaction between forests and agricultural production as antagonistic. Combating the effects of climate change requires a more radical search for innovative approaches that will ensure sustainable agricultural and forest incomes. A combination of the two is undeniably necessary, as revealed by this study, to ensure more resilient food systems. Rather, there is the urgent need to explore possible options for re-inforcing both sectors bearing in mind inter-sectorial linkages within local contexts. In this regards:

- It is important have a good understanding regarding the local dynamics regarding the extent of contribution of NTFPs to local livelihoods and the specific ways these forests interact agriculture to influence the local food system. This is because the interaction between agriculture and forestry is influenced by contextual factors.
- Policies must take an integrated view of both the forestry and agricultural sectors in order to maximize the strengths of both sectors in efforts to combat the negative effects of climate change.
- NTFPs must be promoted holistically within the context of value chains taking into account mutual dependence and relationships with local agricultural production

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