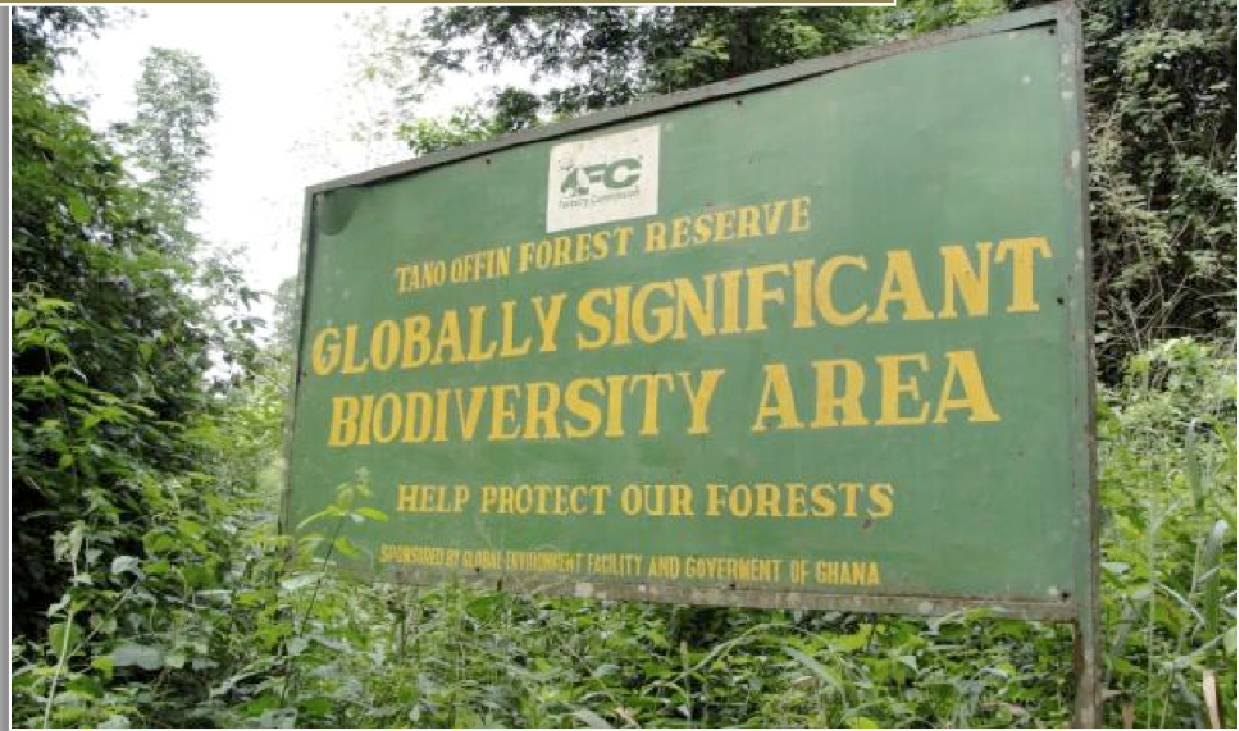


Access to Forest Resources:

Using non-timber forest products in Ghana's High Forest Zone to improve rural livelihoods



MSc. Thesis Universiteit van Amsterdam

Andrew Bell 6011985

Programme International Development Studies

07 February 2010

Supervisor: Dr Mirjam A.F. Ros-Tonen

Second reader: Dr Koen Kusters

Table of Contents	Page
List of tables	3
List of figures	3
List of acronyms	4
Preface	5
Acknowledgements	6
I. Introduction	7
1.1 Background to the study and problem statement	7
1.2 Research questions	8
1.3 Thesis outline	8
II. Theoretical Framework	10
2.1 The NTFP debate	10
2.2 Livelihoods and development	11
2.3 Environmental governance	12
2.4 Forest-based poverty alleviation	14
2.5 Summary	15
III. Methodology	16
3.1 Conceptual scheme	16
3.2 Operationalization of major concepts	17
3.3 Epistemology	18
3.4 Units of analysis	19
3.5 Research methods	19
3.6 Limitations of research	22
3.7 Summary	23
IV. The study area	24
4.1 General characteristics of the Tano Offin Forest Reserve and surrounding area	24
4.2 Overview of existing NTFP studies that refer to Ghana's HFZ	26
4.2.1 <i>The leaf gathers of Kwapanin</i>	26
4.2.2 <i>Rattan</i>	27
4.2.3 <i>Chewing sticks</i>	28
4.2.4 <i>Bush meat</i>	29
4.3 Summary	30
V. Policies and governance arrangements relating to NTFPs	32
5.1 Overview of relevant forestry and NTFP related policies in Ghana's High Forest Zone	32
5.2 Rights to access, extract, plant, manage and transport	33
5.3 Rights in practice: a summary of household survey data and interviews	35
5.4 Summary	37
VI. NTFP extraction in Tano Offin reserve	39
6.1 Uses of major non-timber forest products	39
6.2 Other NTFPs extracted in on and off-reserve areas (Kyekyewere and Kunsu Dotiem)	41
6.3 Summary	42
VII. The contribution of NTFPs to people's livelihoods	43

7.1 Kyekyewere domestic and commercial use	43
7.2 Kunsu Dotiem domestic and commercial use	46
7.3 Summary	48
VIII. Conclusions and recommendations	49
8.1 Summary of the research findings	49
8.2 Discussion (relation to theoretical framework)	50
8.3 Recommendations for further research	52
8.4 Recommendations for policymakers	55
8.5 Reflection	57
IX. Appendices	58
9.1 Vegetation zones and forest reserves of Ghana	58
9.2 Hand sketched map of Kyekyewere	59
9.3 Map of Tano Offin Forest Reserve and Globally Significant Biodiversity Area	60
9.4 Example of household survey	61
9.5 Detailed PROFOR raw table results from Kyekyewere	65
9.6 Detailed PROFOR raw table results from Kunsu Dotiem	66
X. References	69

<u>List of Tables</u>	Page
2.1 Future potential of forest-based poverty alleviation	14
3.1 Operationalization of major concepts	18
3.2 Basic Assumptions regarding epistemological viewpoint	19
3.3 Village data and sample information	20
3.4. Livelihood analysis steps	21
4.1 Stakeholder analysis for Tano Offin Forest Reserve	25
5.1 Statues from 1994 Forest and Wildlife Policy	32
5.2 Table 5.2 List of forest offenses from the Forest Ordinance CAP 157:1927	33
5.3 Biodata from Household surveys	35
6.1 List of some NTFPs found in research areas	41
7.1 Proportion of entire household annual income: Kyekyewere	45
8.1 Benefits of snail farming	54
8.2 Actions suggested by community members from Kyekyewere	56

<u>List of figures</u>	Page
2.1 Sustainable livelihoods framework	11
2.2 Environmental governance framework	13
3.1 Conceptual scheme	16
3.2 Photo: Participant from livelihood analysis	21
4.1 Map of Ghana	24
4.2 Photo: Village assemblyman, Mr. Amos, displaying wrapping leaves from Kyekyewere	26
4.3 Chewing stick trade network	29
4.4 Illegal bushmeat trade poster	30
6.1 Photo: Spices from Kunsu Dotiem	39
6.2 Photo: Nuts from Kunsu Dotiem	39
6.3 Photo: Women from Kunsu Dotiem explaining NTFPs as medicine	39
6.4 Photo: Resin/Incense	40
6.5 Photo: Rural household: Kunsu Dotiem	40
6.6 Photo: Man from Kunsu Dotiem showing his fish trap made from canes and palm	40
7.1 PROFOR livelihoods analysis results: Kyekyewere	44
7.2 PROFOR livelihoods analysis results: Kunsu Dotiem	47
8.1 Photo: Adult grasscutter	53
8.2 Photo: Example of indoor grasscutter housing	53
8.3 Photo: Typical snail found in Ghana's HFZ	54

List of Acronyms

CBNRM	Community based natural resource management
DFID	Department for International Development
FAO	Food and Agriculture Organization of the United Nations
FBPA	Forest Based Poverty Alleviation
FC	Forestry Commission (Ghana)
FORIG	Forestry Research Institute of Ghana
FR	Forest Reserve
FSD	Forest Services Division (Ghana)
GHC	Ghanaian Cedi
GSBA	Globally Significant Biodiversity Area
HFZ	High Forest Zone
KNUST	Kwame Nkrumah University of Science and Technology
MLNR	Ministry of Lands and Natural Resources (Ghana)
MoFA	Ministry of Food and Agriculture (Ghana)
MTS	Modified Taungya System
NGO	Non-governmental organization
NTFP	non-timber forest product
PROFOR	Program on Forests
RMSC	Resource Management Support Centre (Ghana)
TBI	Tropenbos International

Preface

Less than a year ago I had no idea what I would be doing or where I would be going for the fieldwork portion of my MSc. research program. I always knew that I wanted to learn more about environmental issues and how those in the developing world are often more vulnerable to external stresses and shocks in which they have little to no control over. Environmental pressures present themselves in many different forms: land degradation, deforestation, extinction of species, climate change, drought, floods, desertification, and the list goes on. Yet people are always finding ways to adapt to changes that are brought on because of such problems.

But what happens when resources vanish for good? We cannot bring back extinct animals. We cannot push back the desert. We can plant more trees, but they need the right conditions and the time to grow. My interest in environmental issues such as these pointed me into the direction towards Ghana. With the help and encouragement of my supervisor, Dr. Mirjam A.F. Ros-Tonen, I was able to find a project to which I felt I could make a genuine contribution. Having no prior knowledge on specific issues about the complex relationships that exist between people and forests in the developing world, I more or less had to start from the beginning.

Here I am today though, after many lectures, an extensive literature review and ten weeks of fieldwork research in Ghana; now with my final research thesis. Occasionally I ask myself, why focus on non-timber forest products when there are so many other forest-related issues? I think the answer stems from the fact that the world is losing so much of its forest cover and even though global deforestation affects the entire world, those living in or near the forests are affected the most. To make matters worse, the majority of those living near heavily deforested areas see none of the profits from the global timber trade.

I sincerely hope that this MSc. thesis is able to contribute towards the overall project on forest governance, which has been a collaboration between Tropenbos International – Ghana, the University of Amsterdam and the Kwame Nkrumah University of Science and Technology. Even though it is a small portion of the three-year project, I believe that at the very least it paints a picture of the people that live and depend on Ghana's forests.

Andy Bell
University of Amsterdam
TBI – Ghana
07 February 2010

Acknowledgements

For this research thesis there are most definitely people that need to be mentioned, because without their help and support, the entire experience would not have been possible. Firstly, I must thank everyone at TBI-Ghana, especially Mr. Nketiah, who welcomed me into the Governance and sustainable forest-related livelihoods project. Furthermore, my local supervisors within TBI-Ghana proved to be invaluable. Mercy Derkyi helped me to settle in at Tropenbos and for that matter life in Ghana. And Thomas Insaadoo guided me through the research process, helping to put me in contact with the right people and the right study sites. Both Thomas and Mercy's contribution to the overall project will no doubt prove to be crucial to the policy recommendations concerning the governance arrangements that help or hinder the poverty-alleviating potential of forest-adjacent people in Ghana's High Forest Zone.

A very special thanks must also go to my supervisor here in Amsterdam, Dr. Mirjam A.F. Ros-Tonen, whom without I would have never even known about the research opportunity with TBI-Ghana. Her expertise in the realm of forest and poverty-related issues, in particular non-timber forest products, most certainly guided my decision to take part in the fieldwork portion of my MSc. research at the University of Amsterdam.

I would also like to thank the people from the two communities that I had the chance to spend time with. Those in Kyekyewere and Kunsu Dotiem were kind enough to take time out of their busy, hard-working schedules to be with me and help me learn about their livelihoods.

Finally, I must thank my research assistant Marc Owusu. Having completed his studies in renewable resource management at the Kwame Nkrumah University of Science and Technology in Kumasi, his knowledge on the subject of my research facilitated my time in the field, contributing as an interpreter, an administer of the household surveys and organizing the PROFOR participatory group work activities.

I. Introduction

1.1 Background to the study and problem statement

Many people in Ghana depend on the forests for their livelihoods. Unfortunately Ghana suffers from rapid deforestation and biodiversity loss. From 1900 to 1990 Ghana lost 80% of its forest cover and satellite images show that this trend has continued in the last two decades (Opoku 2006). Much of the remaining forests are in the form of protected reserves (see Appendix 11.5). Because of such degradation it is no surprise then that sustainable forest management comes as a significant challenge for rural communities in Ghana. Such communities depend on the forests for their livelihoods and they make use of many different types of forest products. Unfortunately, there is not much research on the role of forest resources in the livelihoods of forest-adjacent people. Furthermore, little is known about the governance arrangements that hinder or enhance the poverty alleviating potential for forest-related livelihoods as well as the conflicts that occur as a result of conflicting interests between various forest users.

The research that was carried out for this thesis is part of a larger, 31 month project under the auspices of the University of Amsterdam, Tropenbos International – Ghana (TBI) and the Kwame Nkrumah University of Science and Technology (KNUST). It is a project that focuses primarily on the issue of governance for sustainable forest-related livelihoods in Ghana's High Forest Zone. The project summary is as follows: *Exchange programme for MSc and PhD students aimed at generating insight into and formulating recommendations on governance arrangements that enhance forest-related livelihoods so that they contribute to sustainable forest managements and poverty alleviation.* This thesis contributes to the overall project by centering on the use of and access to non-timber forest products (NTFPs) in Ghana's High Forest Zone. These non-timber forest products are increasingly becoming an important issue in development studies because of their potential to aid in both poverty alleviation and forest conservation.

The debate concerning what terminology should be used when discussing definitions of non-timber forest products has been around as long as the term itself. Non-timber forest products started to appear in different forestry discourses around the same time as the 'sustainable development discourse' in which people started to realize the actual and potential value of forests to provide many different people many different products (Belcher 2003). Unlike timber, "many NTFPs are available as common-property resources in traditional systems or as *de facto* open-access resources, in state forest lands for example" (Sunderlin *et al.* 2005:1391). In order to gain a better understanding of what NTFPs are I will now briefly compare a few of its competing definitions.

The problem, as Belcher (2003:161) notes, is that 'non-timber forest products' is a negative term, which "includes literally all products other than timber that come from forests." This, as one can imagine, lends itself to many contrasting definitions. The Food and Agriculture Organization of the United Nations (FAO) prefers to use the term 'non-wood forest products', which excludes all woody raw materials. This means that items such as "timber, chips, charcoal and fuelwood, as well as small woods such as tools, household equipment and carvings, are excluded" (FAO 1999). This differs with those who prefer to use 'non-timber forest products', which usually includes fuelwood and smaller woods. Furthermore, this definition excludes services, such as ecotourism and includes products that come from both natural forests and man-made plantations (Belcher 2003). Others however (de Beer and McDermott 1989) do not include plantations when considering sources of NTFPs.

The definition of non-timber forest products I use for the purposes of my research is: “all plant and animal products from forested landscapes, including human-modified ones” (Ros-Tonen and Wiersum 2005:147). In terms of international trade, many NTFPs are significant, including honey, gum arabic, rattan, bamboo, cork, nuts, mushrooms, resins, essential oils, and plant and animal parts for pharmaceutical products (FAO 2008). Other examples of NTFPs include products used as food and food additives (mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibers (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes (FAO 2008).

Ghana’s rural communities make use of many of such NTFPs for daily consumption as well as trade. Falconer’s (1992) report highlights the many different NTFPs that are found and used within Southern Ghana. While the report points out the main uses of the forest products (as foods, medicines, building materials and household goods), it also is critical of how they are managed, such as the permit system for acquiring certain resources. Furthermore, while the report is slightly outdated, many of the same issues are present today within Ghana, specifically NTFP use, management and trade. The problem statement for this research thesis thus becomes: Forest and tree resources do not adequately serve as reliable sources of livelihoods for Ghana’s rural communities. It is evident that people still rely very much on non-timber forest products in Ghana’s High Forest Zone, and the extents to which NTFPs contribute to people’s livelihoods as well as the rights they have to attain them represent the main topics of this thesis. The following are the main research questions from which the remaining of the thesis will attempt to address.

1.2 Research questions

This thesis addresses the following research question: To what extent do governance arrangements in Ghana’s High Forest Zone help or hinder local people’s right to access NTFPs for their livelihoods?

1. What policies and governance arrangements (including the rights to access, extract, plant, manage and transport) are in place to support NTFP conservation, utilization and trade?
2. What kinds of animal and plant non-timber forest products are extracted under each of these arrangements?
3. What is the contribution of NTFPs to people’s livelihoods in terms of domestic use and trade?

1.3 Thesis outline

The remaining chapters focus on answering these questions as well as raising new ones. In order to do so it is first important to review the main theories that relate to non-timber forest products. Chapter 2 looks at the theoretical framework for the thesis, including livelihoods and development, environmental governance and forest-based poverty alleviation. I will then present a conceptual framework in Chapter 3 that highlights the main themes present within the research. This will be followed by the operationalization of the major concepts and the methods carried out during the fieldwork portion of the research.

Chapter 4 looks at the study area in Ghana’s HFZ, specifically the two forest communities of the Tano-Offin Forest Reserve: Kyekyewere and Kunsu Dotiem. I will then give an overview of the relevant NTFP policies in Ghana’s HFZ, followed by existing NTFP studies that refer to the High Forest

Zone. Chapter 5 reviews the policies that are in place relating specifically to NTFPs. This chapter culminates by looking at people's rights in practice, in which some of the fieldwork data will be revealed.

Chapter 6 and 7 examines which NTFPs are extracted in the Tano-Offin Forest Reserve and their contribution to people's livelihoods. These chapters draw attention to the NTFPs found both in and off the Forest Reserve and how people use them, whether for domestic or commercial purposes. The final chapter is titled 'Conclusions and Recommendations', in which a summary of the research findings will be presented and recommendations will be given for both policy makers and further research.

II. Theoretical framework

2.1 The NTFP debate

There was a high degree of optimism from both scholars and international organizations centering on the potential of non-timber forest products having the ability to improve livelihoods as well as increase the value of forests. It was assumed that the commercial extraction of NTFPs from natural forests could simultaneously serve the goals of biodiversity conservation and poverty alleviation (Ros-Tonen and Wiersum 2005). The general idea behind the biodiversity conservation assumption is that extraction of NTFPs is far less destructive to the forest than timber harvesting (Belcher 2003) and with proper management a sustainable form of forest exploitation can be achieved. Further, NTFP extraction can also be used to generate income, which is thought to be incentive for people to better preserve the forest. Over the years this assumption has been challenged, as is evident in past case studies (See Chapter IV).

What is the role of non-timber forest products in poverty alleviation and improved livelihoods? With regard to tropical forests, NTFPs are a “main source of livelihood of forest-dwelling communities, who rely on these products for their food, medicines and as raw materials for the houses, tools and equipment” (Ros-Tonen 2000). Some practical advantages of NTFP extraction are that many are available as common property resources, they can be used with little processing and often they require low-cost, traditional technologies (Sunderlin *et al.* 2005). The idea then is to open up NTFP extraction to markets and trade, whereby increased income and employment opportunities can lead to improved livelihoods and help bring people out of poverty. Belcher and Schreckenberg (2007: 356) base this expectation on the “well-documented importance of many NTFPs in rural livelihoods, the emergence of new markets for natural products and the development of new marketing mechanisms, such as green marketing and fair trade.” In principle, the commercialization of NTFPs seems like an important step in combating poverty alleviation as well as preserving forests.

Recently there has been a major shift to reexamine just how successful the commercialization of NTFPs has been. With regards to biodiversity conservation, commercialization of NTFPs has provided a limited contribution to sustainable forest use. Peters (1996) notes some negative impacts from commercially harvesting NTFPs: nutrient loss from harvested material, decreasing rates of seedling establishment, reduced frequency of growth of harvested material and potential loss of local animal populations. Presumably, the challenge of overexploitation becomes exacerbated once a particular NTFP has an increased market demand. In this case there must be supportive measures taken to protect NTFP exploitation. These measures come in the form of governance arrangements, such as permit systems for extraction and licenses for hunting within forest reserves.

The main conclusion to be drawn regarding NTFP extraction as a means of poverty alleviation and biodiversity conservation is that expectations should be approached with caution. In terms of forest conservation NTFP exploitation must be managed in a highly organized manner. Governance arrangements and regulatory measures are only part of the solution. Ros-Tonen (2000) notes these important considerations: ecological parameters must be known, local indigenous knowledge must be taken into account and the effects on the socio-economic conditions need to be acknowledged. Also of importance is the challenge of income distribution within communities. Wiersum and Ros-Tonen (2005) note that care must be taken when developing new market opportunities for NTFPs. Unequal income distribution could lead to the creation of new elites, disrupting the structure of

communities. Furthermore, it often goes together with exploitative relationships between extractors and traders in NTFPs.

2.2 Livelihoods and the environment

It was Sen (1999) who was critical of the development process, stating that it is wrong to only seek to maximize wealth or income. “Development has to be more concerned with enhancing the lives we lead and the freedoms we enjoy” (Sen 1999:14). It is generally agreed now that any attempt to measure poverty should be done so with care, as there are many different variables that must be taken into account. It is also important not to generalize – we must look at people and their livelihoods on a context-specific basis. The term livelihood is a concept that appears much in the dialogues of development, poverty and the environment. But what is meant by livelihoods and the environment and how is this term going to be used in this thesis? I will first begin with a general livelihood framework, and build to a framework that focuses more specifically on poverty reduction for rural livelihoods.

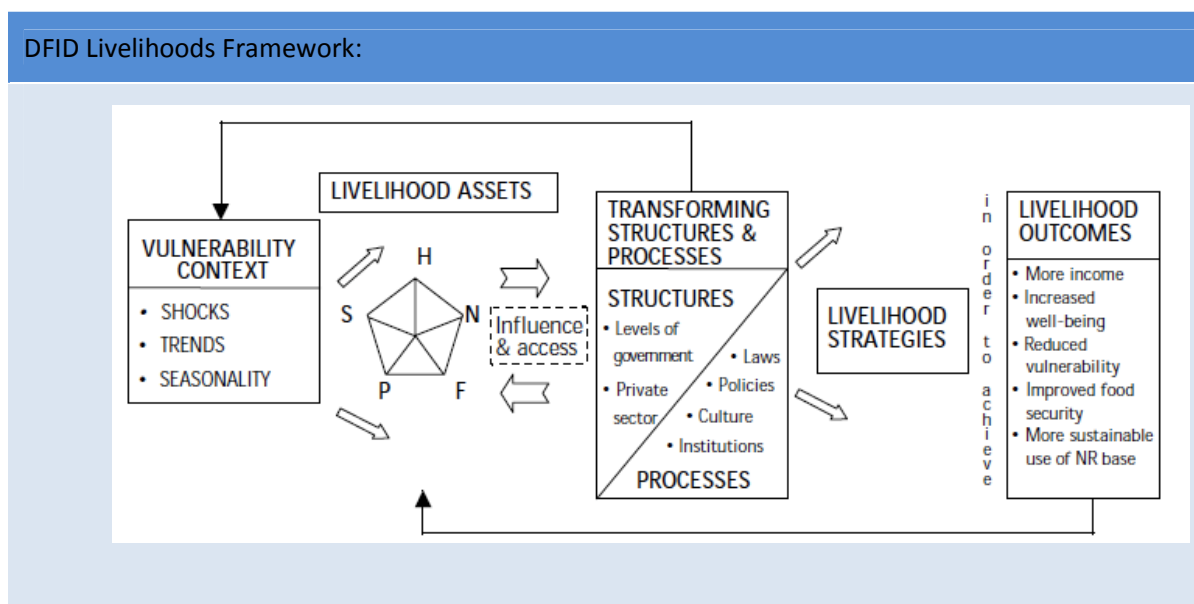


Figure 2.1 The sustainable Livelihood Framework (DFID 1999).

In a very basic sense, a livelihood is simply the way we secure the necessities of our life. If we look deeper though at the meaning of livelihood within the context of development, it is possible to extrapolate much more than only securing the necessities of life. The livelihoods concept in development focuses first and foremost on people (DFID 1999). This approach is founded on a belief that people require a range of assets to achieve positive livelihood outcomes (DFID 1999). Figure 2.1 conceptualizes the livelihoods approach, focusing on people’s vulnerabilities, the capitals they employ and the strategies they use in order achieve their livelihood outcomes. This centers on the 5 different capitals, namely human, financial, natural, physical and social. Human capital is associated with skills, knowledge, good health and the ability to work. At the household level, human capital can simply mean the amount of labor available, including its professional schooling and skills. Financial capital refers to the availability of cash or its equivalent in order for people to achieve their desired livelihood outcome. Natural capital refers to natural stocks of different resource bases. It can

make up intangible public goods such as the atmosphere and biodiversity (DFID 1999), or tangible things that can be used directly for household consumption or production (e.g. NTFPs). Physical capital makes up the basic infrastructure needed in order to sustain livelihoods, such as shelter, water supply, sanitation, etc.. The final of the five capitals is social capital, which can be difficult to conceptualize. Social capital can refer to the networks people belong to, whether familial or on a broader scope, such as community organizations. It also refers to “relationships of trust, reciprocity and exchanges that facilitate cooperation, reduce transaction costs and may provide the basis for informal safety nets amongst the poor” (DFID 1999:1).

There are of course some who are critical of this model, in that it does not address certain issues. Bebbington (1999) in particular believes there needs to be more emphasis on access to resources, which is something that is very relevant for the remainder of the thesis. Focusing explicitly on rural livelihoods, Bebbington (1999:2022) argues that it is important to break down access to resources, “because access becomes perhaps the most critical resource of all if people are to build sustainable, poverty alleviating rural livelihoods. This idea is explored in Section 2.4 of this chapter on *Forest-based poverty alleviation*. We can place this concept into the context of forest-related livelihoods. In some cases people indeed have many of the capitals they need in order to achieve their desired livelihood outcomes, however they are unable to do so simply because they lack access rights to the forests (Wiggins 2004).

It is possible to take from Sen’s (1999) *Development as Freedom*, as well as DFID’s (1999) livelihoods analysis and find a framework that fits for the purpose of this thesis. A main concept that will arise throughout the thesis as is indeed posed in one of the research questions, is that of rights to access. In order to come up with a definition of livelihoods, with respect to the access to and contribution of NTFPs, we need a modified definition of the term. So what do we mean about livelihoods and the environment? DFID (1999) provides a good general overview of a livelihoods framework, in that it shows how people use their assets in order to secure positive livelihoods outcomes, by employing a range of different capitals. However for the purposes of this thesis, which falls in line with rural livelihoods, I share Bebbington’s (1999) view that perhaps the most important capital of all is access to resources.

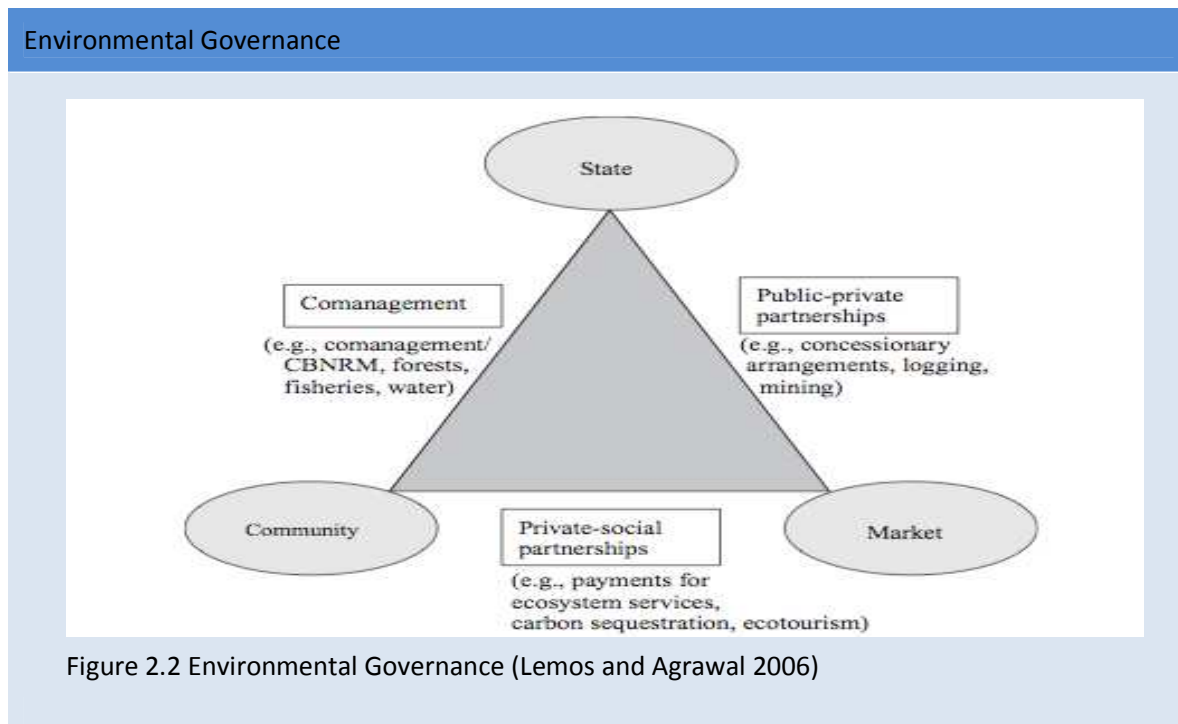
2.3 Environmental governance

Governance is inherently complex in that it involves a host of different actors, all with competing claims, values and interests. It is an important concept in development because it encourages interaction and participation on many different levels. But what is governance? How is it different from government? Kooiman and Bavinck (2005:17) provide the following definition:

“Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and applications of principles guiding those interactions and care for institutions that enable them.”

For the purpose of my research it is perhaps even more appropriate to discuss governance with regards to the environment, namely forests. Environmental governance refers to the “set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes” (Lemos and Agrawal 2006:298). So who then are these actors, or stakeholders? In Ghana, for both on and off-reserve forests, there is a wide range involved: the central government (its Ministry of Lands, Forestry and Mines), the Forestry Commission, stool

landowners, district assemblies, forest fringe communities, non-governmental organizations (NGOs), timber contractors, administrators of stool lands, and private plantation developers, both local and international (Boakye and Baffoe 2006). It is through the interactions of all actors and the partnerships they form with one another that determine whether or not certain mechanisms and strategies can be effective in sustainable development. The following figure serves to conceptualize these relationships:



How does this model work if we directly apply it to forest governance? Higman *et al.* (2005) believe that forest governance is about the policy, legal and institutional conditions that affect how people treat forests. Rather than focus on the formal political structures of government, it is the quality of the decision-making process between all the actors (state, market and community), which can determine whether or not good forest governance is present. Good forest governance promotes transparency, accountability, and equity; and encourages the implementation of sustainable forest management (Higman *et al* 2005).

It can be argued that forest governance in Ghana is in need of reform. The 1994 Forestry and Wildlife policy does stress the importance of collaborative forestry management and community-based natural resource management, however some believe that the state's real commitments are still strongly tied to the timber industry (Opoku 2006). In fact Treue's (2001) research shows how the government and the timber industry have been teaming up for years, promoting an export oriented timber industry, with little concern for sustainable practices. With strong financial interests to maximize timber export revenue, the timber industry was given the benefit of the doubt when sustainability of the recorded timber harvest was questioned (Treue 2001). The policies that are in place have proven to be problematic, especially with regard to sustainable forest management. Another reason for this "stems from limited understanding of the effect of the interaction between

forest policies and indigenous tenure systems” (Owubah et al. 2001). This clash between statutory (government) and customary (community) law will be discussed in further chapters.

2.4 Forest-based poverty alleviation

People that depend on forests for their livelihoods are often marginalized groups, who very frequently find themselves with little income opportunities. According to the World Bank (2001), more than 25% of the world’s population, around 1.6 billion people rely on forest resources for their livelihoods, and of these almost 1.2 billion live in extreme poverty. This section explores the relationship between forests and poverty through forest-based poverty alleviation (FBPA). Before we can define FBPA it is first necessary to be clear what we mean by ‘forests’ and ‘poverty’ as they are terms interpreted by many people to mean different things. For the purpose of this proposal I use Sunderlin et al. (2005) and the World Bank (2001) to define the following terms:

- *Poverty*: pronounced deprivation of well-being related to lack of material income or consumption, low levels of education and health, vulnerability and exposure to risk, lack of opportunity to be heard and powerlessness.
- *Forests*: broadly speaking to all types of forests, including untouched, natural forests as well as those with high levels of intervention and management.
- *Forest-based poverty alleviation*: use of forest resources for the purpose of lessening deprivation of well-being on either a temporary (poverty mitigation) or lasting basis (poverty eradication). FBPA is based on a wide array of economic activities, such as agriculture, pastoralism and non-farming employment.

The theory behind forest-based poverty alleviation falls very close in line with that of the NTFP debate. It does so by asking similar questions. Can forests support poverty alleviation? Can the use of forests and the resources in them be compatible with forest conservation? If we turn to the NTFP debate, as well as past case studies, the evidence suggests that answering both of these questions remains to be a challenge for those who depend on the forest for their livelihoods, particularly in Ghana’s High Forest Zone. This is because factors like good governance arrangements, participation by locals and sustainable resource management must all fall in line with one another. This is something that is difficult to put into practice because of the very nature of the complexity involving so many actors.

What ways can forests play a role in poverty alleviation? The following is a summary of Sunderlin et al. (2005) conclusions about the future potential for FBPA, also noting trends from the past:

Table 2.1 Future potential for forest-based poverty alleviation

1. <i>Conversion of forests to agriculture</i> : Worldwide, there has been a general increase in levels of income due to forest cover removal, on either a temporary basis (swidden cultivation) or permanent (sedentary agriculture) basis. This has allowed easier access to fertile soils.
2. <i>Timber</i> : Timber is by far and away the most valuable forest product. If villagers manage the forests then there is greater potential for local communities to benefit from timber wealth. In this scenario

poverty alleviation has been undermined, however, by weak institutions, local elites, inconsistent laws, etc.

3. **Non-timber forest products:** Aside from the many NTFPs that are used domestically (for fuel, food, medicine, etc.), many are produced for sale into different market systems (See Appendices 11.2-11.4). Usage of NTFPs in poverty alleviation can be seen in that they are often available as common property resources, they can often be processed using low-cost methods and that they can be used as ‘safety-net’ resources in hard times. However, a lot of evidence points to the fact that once a certain NTFP becomes highly marketable it also becomes very difficult to manage, especially in terms of overexploitation.

4. *Environmental services:* Four types of payments for environmental services have been dominant in the past: carbon storage, hydrological protection, biodiversity conservation and recreational values. Continuous degradation of the world’s forests, including deforestation, threatens the role of environmental services as a contribution to poverty alleviation.

5. *Employment:* This includes those employed in the formal and informal forestry sector worldwide. The scope for poverty alleviation through increase of forestry sector employment remains unclear.

Source: Sunderlin et al. 2005.

2.5 Summary

This theoretical framework serves as a guide for the rest of the thesis. The major issues that have been presented here are echoed throughout the remaining chapters. The NTFP debate seeks to answer the question about the possibility of simultaneously preserving biodiversity as well as alleviating poverty in rural areas. Another key concept is that of forest-based livelihoods. What are the components of a forest-based livelihood? How do people in Ghana’s HFZ make use of these components in their daily lives? These questions will be answered in this thesis.

Another important issue is that of governance. How do different actors from different sectors collaborate with one another in order to devise and maintain various governance arrangements? This question will be answered with specific reference to non-timber forest product extraction and consumption. Finally, forest-based poverty alleviation asks if forests can support poverty alleviation? Can forest resources help rural households mitigate the suffering they may have in hard times, such as unyielding crop seasons due to poor weather condition? These theories are intended to explain a set of common ideas about people and forests, forests and poverty and environmental governance. In order to better visualize how these theories help to serve this thesis the following chapter begins with a conceptual scheme, which attempts to explain the different relationships between theory, actors and livelihoods.

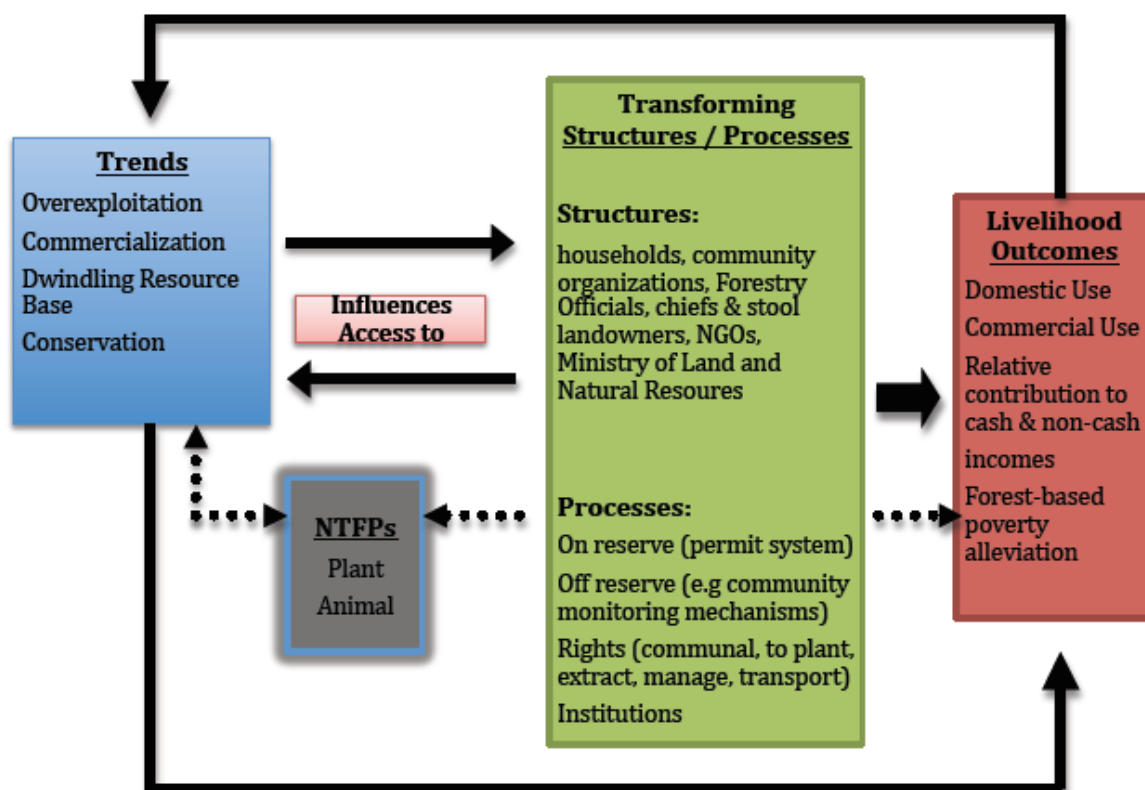
III. Methodology

This chapter begins with the conceptual scheme, which highlights the various themes and actors present within the overall research study. From there, the concepts are operationalized, which help to answer the research questions. The operationalization section bridges the gap between concept and data gathering methods. Thus, what methods are used for data collection depend on what questions are being asked in the operationalization section. Section 3.3 briefly gives an overview of my epistemological viewpoint. In social science research I believe it is important for the researcher to have a clear understanding of his or her view on the nature of the social world. This, along with the operationalization scheme, dictates which particular methods will be used during the course of the research. The remaining sections of this chapter discuss my unit of analysis, methods used and my research limitations.

3.1 Conceptual scheme

When dealing with so many different variables is it often difficult to keep track of how they relate to one another. How do the different ideas that make up the theoretical framework affect or influence the other main concepts in the research? This conceptual scheme presents such variables in such a way that the causal relationships associated with my fieldwork research.

Figure 3.1 Conceptual scheme



In Figure 3.1 it is possible to make some connections about the major concepts and themes of this thesis. In the figure, the processes represent the various systems and issues associated with governance arrangements. The NTFP trends, including the NTFPs themselves (both plant and animal), influence the transforming structures and processes. Alternatively, the processes and structure can change to influence the NTFPs trends. For example, overexploitation of a certain NTFP can lead to a transformation in resource management, such as stricter permit laws. Going the other direction in the scheme, from right to left, a lack of institutional change or poor governance arrangements can influence NTFP consumption, potentially leading to overexploitation and a dwindling resource base. One final thing to consider is that of the transforming structures. The structures represent the various actors that play a role in the decision-making process that affects the NTFPs trends and livelihood outcomes.

All of the NTFP trends, structures and processes in the above conceptual scheme affect the livelihood outcomes for rural communities in Ghana's HFZ. For example, communal rights dictate domestic NTFP use when extracted from on-reserve areas. Furthermore, off-reserve NTFP extraction is far less restrictive (as opposed to the permit system) and has thus led to dwindling resources for many communities, including the two research villages I visited. The final element that needs to be addressed is that of the relative contribution to cash and non-cash incomes. This refers to household consumption and use of NTFPs and other components that make up a livelihood, such as crops from farmland, farm animals, wages and remittances. This idea of cash and non-cash incomes will be further elaborated on in Section 3.5 of this chapter.

3.2 Operationalization of major concepts

The following table narrows down the major concepts of the thesis into different dimensions and variables. The final column represents the indicators, which help to answer the research questions. These indicators dictate the different research methods that I used during my fieldwork research. Many of the indicators in this operationalization scheme were put directly into my household surveys (Appendix 9.4). The answers to many of the questions listed under the 'Indicators' heading will be addressed in the subsequent chapters.

Table 3.1 Operationalization of major concepts

Concept	Dimension	Variable	Indicator
Governance arrangements	On/off- reserve	Forest arrangements	Forest-use schemes in place
		Tree arrangements	Tree-use schemes in place
			General forest and tree-use laws and regulations in place
	Rights	Access	Who has the right to access NTFPs?
			Are permits needed to extract and trade any of the non-timber forest products?
			Is there a registration system in place for NTFP extraction?
			Any NTFPs no longer available? Due to extinction of species for example?
		Plant	Are there any restrictions in place to plant certain species?
		Extraction	What methods used for extraction?
			Are controlled techniques used? (sustainable rate?)
		Management	Are there community-monitoring mechanisms in place (e.g. harvesting calendar)?
NTFPs	Utilization	Products extracted	Types of plant and animal non-timber forest products that are being extracted
Livelihood	Contribution	Commercial use	Proportion of products traded
			Markets where traded
			Marketing arrangements in place
		Domestic use	NTFPs kept for domestic use

3.3 Epistemology

In social science research I believe it is difficult to establish a linear path directly linking an epistemological viewpoint with a certain set of research techniques. Research is not uniform, nor are the methods used to carry out a specific research project or objectives. If one is to use mixed methods, employing both qualitative and quantitative techniques, then how is it possible to accurately defend a specific epistemology? The problem, as Bryman (1984) notes, is that confusion tends to set in when treating philosophical issues (epistemological) and technical issues (methodological) simultaneously. The chart below best describes my epistemological stance.

Table 3.2 Basic assumptions regarding my epistemological viewpoint

Reality as Symbolic Discourse	World is a pattern of symbolic relationships through processes of human action and interaction
Humans as Social Actors	Humans interpret their environment in ways that are meaningful to them
Epistemological Requirements:	Understanding the nature of human interaction Rejects the idea that the social world can be represented in terms of deterministic relationships Instead, favors a view that knowledge, understanding and explanations of social affairs must take into account of how social order is fashioned by human beings in ways that are meaningful to them
How are findings treated?	Do not hold that findings obtained are universally generalizable Do hold that findings provide nonetheless insightful and significant knowledge about the nature of the social world

(Adapted from Morgan and Smircich 1980)

According to Morgan and Smircich (1980), this falls in line somewhere in the middle of the scale between subjectivist and objectivist ontological positions. This stems from my research methodology, which is mixed (see below) in that it incorporates both qualitative techniques (participatory group activities and interviews) as well as quantitative techniques (surveys). I do not favor one technique over the other but instead use the different types of data as a checks and balance system to test for accuracy and authenticity of the results. One thing that I strove to do throughout my research was to remain humble before the community's own local knowledge and practices. The aim, as Chambers (2007) suggests, is to encourage the sharing of such knowledge.

3.4 Unit of analysis

My unit of analysis is the individual household¹. This is because I want to determine the importance of NTFP extraction in people's livelihoods, taking into account the differences between each household. Also, due to limitations of time and expenses, using the household was more efficient than in trying to find individuals using random sampling.

3.5 Research methods

Overall I used a variety of methods for my research, which commands a mixed method approach. I derived the methods based on the conceptual scheme and operationalization of the major concepts. The intention is to come up with appropriate research methods that will enable me to answer the research questions. The following methods were used, which follow a participatory, qualitative and

¹ For the purpose of my research in the rural communities I visited I defined 'household' as not only the immediate family members living under the same roof but also those of extended family members as well.

quantitative approach and which utilized aspects of the PROFOR toolkit² (Program on Forests 2008). Its strategy is based on harnessing the potential of forests to reduce poverty; integrating forests in sustainable economic development; and protecting global forest values (PROFOR 2008).

Household survey: The surveys were used to determine which NTFPs are utilized for domestic use and which are traded commercially. They were also used to determine which governance arrangements pertain to the village and to what NTFPs. Local research assistants administered the surveys, which was necessary because I do not speak the local language (Twi).

The basic criteria for choosing my target population is that it was located in Ghana's High Forest Zone and that the population utilized NTFPs for either domestic or commercial purposes. Because of this I used a purposive non-random sample. With the help of my local supervisors I chose two villages that I knew would fulfill this criteria. The danger of course with this type of sample is that there is no way of knowing how typical the sample really is (Nichols 1991).

In my case I chose two villages (see Chapter IV) that are located in Ghana's HFZ, one located within a forest reserve and one located just outside a forest reserve. Each of the villages is located within the same Forest District, but they are located within separate administrative districts. Table 3.3 summarizes my sample locations and sample sizes, noting the average size of households.

Table 3.3 Sample villages, location, population size and sample size

Name of village	Region	Admin. District	Forest District	Population	Sample Size	Avg. per household
Kyekyewere	Ashanti	Atwima	Nkawie FD	4 – 500	31	8.5 persons
Kunsu Dotiem	Ashanti	Mankranso	Nkawie FD	3 – 450	32	6.4 persons

PROFOR toolkit: PROFOR offers a toolkit for NGOs and researchers, which serves as guidelines for conducting forest-related livelihood studies. The toolkit offers 8 different types of methods. I chose three tools in particular that I thought would help to answer my research questions.

- Tool 2 – Landscape Analysis: the aim of this tool is to understand the way in which local resources are used by members of the village (PROFOR 2008). This tool allows the researcher to get a sense of the way people use their landscape, and the rules that they apply to it or, in the case of the Forestry Commission and its Forest Reserves, the rules that are applied to the landscape. This is similar to a transect walk but is slightly modified in that it does not necessarily mean the walk goes along a straight line through the village and its various land use zones.

I carried out one such modified transect walk in the village of Kyekyewere with the village assemblyman, Mr. Amos. This was a very useful tool that allowed me to quickly become familiar

² The Programme on Forests is a multi-donor trust fund financed by the Department for International Development (DFID) of the United Kingdom, the Finnish Department for International Development Cooperation, the Japanese International Forestry Cooperation Office and Swiss Development Cooperation (SDC). The German Government is an in-kind contributor. Set up by the United Nations Environmental Programme (UNEP) in 1996, PROFOR has been hosted by the World Bank since 2002 (<http://www.profor.info>).

with the village boundaries, major crops and NTFPs that are used there, as well as some of the problems that the community was facing. Upon finishing the transect walk Mr. Amos drew a map of the village for me, highlighting where we had been, showing the allocated farmland and the forest reserve boundary (See Appendix 2).

- **Tool 4 – Livelihood Analysis:** the aim of this tool is to discover the extent of cash and subsistence reliance on forest resources and the proportion of the total annual livelihood (from all sources) that comes from forest resources (PROFOR 2008). The tool calls for splitting up the village and participants into groups divided by wealth rank. Given the short amount of time I had with the villagers I felt that this would be inappropriate to do so I split the groups based on gender alone. The groups consisted of 20 participants, 10 female and 10 male. In choosing the groups I requested the help of the village assemblyman to find people that were willing to participate in the exercise and that were not from the same household. The process as outlined in Table 3.4 was carried out in both villages, Kyekyewere and Kunsu Dotiem.



Figure 3.2: One of the participants during the Livelihoods Analysis

Table 3.4 Steps in the livelihood analysis using the PROFOR tool

Step	Process
Step 1: Overview of the main cash components of the household's annual livelihood	<p>On a large piece of paper, under the headings, 'Forest Products', 'Agric Products', 'Farm Animals' and 'Wages/Remittances', the participants listed all of their annual sources of income.</p> <p>One by one each of the 10 participants from either group came up and placed 20 stones (which represent their annual income) along the sheet where they derived cash benefits. Using 10 stones is not possible because the participants derive benefits from more than 10 sources. Using more than 20 stones can make the process last longer than needed, possibly allowing for too much time for each participant to place the stones.</p>
Step 2: Overview of the main non-cash components of the household's annual livelihood	<p>Repeat Step 1 but this time there is no heading labeled, 'Wages/Remittances'. Non-cash was explained in terms of benefits received that do not generate cash, i.e. for domestic or daily use. 20 stones are used again for this exercise.</p>

Step 3: Proportion of the entire household's annual income that comes from cash and non-cash sources	Each group has a separate sheet of paper with the headings, 'Cash' and 'Non-cash' and 'Total', which is listed at 20. Again, one by one the participants come up and place their 20 stones on either side of the chart. This step helped to show whether households derived most of their benefits from cash or non-cash sources.
Step 4: Calculation of the results.	This step was completed at a later time. The results from both villages will be presented in the following chapters.

(PROFOR 2008)

- Tool 5: Forest Problem and Solution Matrix: the aim of this tool is to identify and rank the main forest problems, and suggest potential solutions. Problems of law, policy, tenure and access are captured through this tool (PROFOR 2008). In this exercise the same participants as those who participated in the above groups were asked what they thought the main problems were in their village and how they thought the problems could be solved.

After the problems that the participants mentioned were noted, they were asked to rank the problems in order of importance. They were then asked at what level they thought the problems should be dealt with; at local level, or within the village, or at regional or national levels.

Semi-structured Interviews with key informants: I completed interviews with several key informants. Some were at the local level, such as with chiefs and village elders. Other interviews were with professionals, which included individuals working in NGOs and within the Forestry Commission. I did not complete as many interviews as I would have liked due to the fact that I had limited time and resources at my disposal in order to travel and meet certain officials. Access was another problem. Many of the forest officers are constantly patrolling the forest reserves and because I spent a limited amount of time in and around the reserves, it was difficult to locate many of the authorities.

Document Analysis: In order to establish what governance arrangements apply to which NTFPs I made use of the Resource Management Service Center (RMSC) based in Kumasi. The RMSC is a division of the Forestry Commission and proved to be a valuable source of documents and reports relating to NTFPs in Ghana's HFZ. It should be noted that there is an abundance of unpublished research reports from the last 15 years sitting in desks and on shelves at the RMSC. I imagine that they would be of great use to researchers and policy makers alike if they were ever to be scanned and uploaded onto the Forestry Division's website. Having said that, due to time constraints and access I was able to find and take with me only a handful of documents. I also made use of the libraries at TBI-Ghana and FORIG, which have many good general forestry resources.

3.6 Limitations of research

There are several limitations to my research. Firstly, it should be noted that the outcome of the results from the household surveys was limited in that it was necessary to use field assistants who spoke the local language, Twi. I had only a short time to prepare them about the nature of my fieldwork research. I have also had to interpret what they wrote down on my survey forms. Secondly, in the second village I visited, Kunsu Dotiem, I completed the PROFOR activity with another MSc. student who was focusing on an entirely different forest governance arrangement, the

Modified Taungya System (MTS). Upon the start of the exercise I realized that most of the participants were in fact MTS farmers so that may have had an affect on the PROFOR results concerning NTFP extraction. If most of the participants were farmers then it is only natural that most of the cash and non-cash income will result from their MTS plots.

Thirdly, I am aware that my definition of ‘household’, especially because it is my unit of analysis, may be oversimplified in a sense that it overlooks the divisions and gender differences that take place within household. Because I use a definition that includes extended family members, the complexities and dynamics that occur within a household have not been formally addressed. In order to establish the different objectives for each of the decision-makers within a particular household I would need much more time and a much more focused study, possibly solely one or two families. Lastly, there is the issue of time and money. Because I only had 10 weeks for my fieldwork I had to make the most of my time. With the help of my local host institution and my local supervisors, Ms. Mercy Derkyi and Mr. Thomas Insaidoo, I was able to locate the appropriate research villages. However, both Kunsu Dotiem and Kyekyewere are located approximately 2-4 hours away from the Tropenbos – Ghana office in Kumasi. Both villages required a preliminary visit one week prior to the data collection period in order to go through the appropriate formal procedure. This included obtaining permission from the head Forest Officer at the Nkawie District office, meeting and discussing my research plan with the local forestry official from the Tano Offin FR and of course meeting and informing the chiefs and village elders from both villages of my research intentions.

Regarding the issue of money it should be noted that the University of Amsterdam and TBI – Ghana helped to subsidize funding for my research experience. There were, however, costs which I did have to incur such as paying for research assistants, days’ wages and refreshments for PROFOR Participants and finally for the driver. This means that I had to maximize my time in the villages as efficiently as possible. I would have liked to have more time in both Kunsu Dotiem and Kyekyewere but due to financial and time constraints it was simply not possible.

3.7 Summary

In order to answer the research questions to the best of my ability it is crucial to have a sound research methodology. This chapter addressed the major concepts associated with the research questions by presenting a conceptual scheme as well as an operationalization plan. My epistemological stance is that I view the social world as a series of processes of human action and interaction. In this way we as social actors interpret the world around ourselves and draw conclusions on our interpretations. The main point here is that we all interpret the world differently.

The second half of this chapter focuses on more concrete issues, such as the unit of analysis (the household), the methods used and the limitations of the research. The following chapter provides an overview of the study area and the main stakeholders present. Following this are four NTFP-related case studies from Ghana, which provide insight into my research as well as trends that shaped my basic assumptions prior to going into the field.

IV. The study area: Ghana's High Forest Zone

This chapter provides an overview of Ghana's HFZ, the research sites I visited and brief summary of the characteristics of the Tano Offin Forest Reserve, including the main stakeholders associated with the reserve area. I will then provide four case studies that focus on NTFP extraction in the HFZ. This will help to give a background of the certain issues surrounding NTFP use and exploitation from my particular research areas.

4.1 General characteristics

Ghana is situated in West Africa. It is bordered by Burkina Faso, Cote d'Ivoire, Togo and the Gulf of Guinea to the North, West, East and South respectively. The High Forest Zone covers approximately 82,000 km², or about one third of the land area (Treue 2001). The HFZ is dominated by farmland (including fallow and some plantations), with forest and wildlife reserves covering approximately 20% of the zone (Hawthorne and Musha, 1993:4).



Figure 4.1 Map of Ghana and the study area (GSPD 2009)

My research sites were located within and adjacent to the Tano Offin reserve, which is located within the Nkwawie Forest District. This reserve is located in the Greater Ashanti Region of Ghana, which is area highlighted to the East. The reserve falls within the Atwima-Mponua and Ahafo Ano South District Assemblies and covers a gross area of 413.92 km² (see Appendix 3 for map).

The Tano Offin Forest Reserve was constituted under the Kumasi Native Authority Rules of 15th December 1949 (Kyereh 2007). It is unique because situated inside the reserve is a Globally Significant Biodiversity Area (GSBA), which makes up 178.34 km², or roughly 44.5% of the reserve. It was set up in 1999 with the help of the Global Environment Facility and is one of three Upland Evergreen Forests in Ghana (Kyereh 2007). There are 627 ha of village land and farmland in the GSBA. The reserve has a small mountain range running through it, with peaks between 200 m and 750 m above sea level. The steep slopes of the range are drained by two major rivers, the Tano and Offin (Kyereh 2007).

There are a total of 42 village settlements that lie on the fringe of the Forest Reserve. This includes one so-called 'Admitted village' that is located within the Forest Reserve and inside the GSBA, Kyekyewere. The total population of these settlements is estimated at 25,900, out of which 52.8% constitute the male population and 47.2% represent females (Kyereh 2007).

I visited two main research sites, one off-reserve and one on-reserve, as well as a third site that was used as an informal site for piloting some of my research questions and surveys. The village of Kunsu Dotiem is located just along the perimeter of the Tano Offin Forest Reserve, and has a population between 300-400 people. The village of Kyekyewere is located within the FR as well as the GSBA, and

has a population between 400-500 people. The third village I visited was Sefwi Abrabra, located in the Sefwi Wioso district. Sefwi Wioso is not located near the Tano Offin FR and I am unaware of its population.

When looking into any forested area it is important to know which stakeholders are involved. In most cases, including that of the Tano Offin FR, there are many vested interests regarding the forest, which makes it difficult to meet the needs of everyone's objectives. For instance, the goals of the timber merchants are quite different than those of the farmers, or NTFP gatherers. I believe this is a major reason behind the lack of success to good forest governance and sustainable forest management. The Forestry Commission carried out a stakeholder survey of the Tano Offin Forest Reserve, which reveals the institutions, bodies and individuals that have certain claims on the area. This list shows the stakeholder, the representative and the stake (or interests) that each stakeholder has vested in the reserve. The Forestry Commission has ranked these stakes as 1, 2 and 3 (high, medium and low, respectively) for each stakeholder.

Table 4.1 Stakeholder analysis for the Tano Offin District

Stakeholder	Representative	Stake	Rank
Forestry Commission	District Manager/ Range Supervisor	Management of Forest	1
Ghana Wildlife Society	Remote	Conservation of fauna	2
Environmental Protection Agency	Remote (regional)	Compliance with national environmental standards	2
Minerals Commission	Remote	Exploration of minerals	1
District Assemblies	Atwima	Sustainable benefits from the forest	2
The Kumasi Traditional Council	Golden Stool	Ownership and benefit flow	1
Admitted Farmers	Farmers/Reps	Farming	1
Admitted Village (Kyekyewere)	Community	Settlement/livelihood (i.e. farming, NTFP collection)	1
Environmental NGOs	Remote	Maintenance of environmental integrity	2
Community based organizations	Community reps	Maintenance of environmental integrity and benefit flows	1
Forest fringe communities (such as Kunsu Dotiem)	Villages around GSBA	NTFPs, benefits	2
Hunters/ NTFP Gatherers	Hunters	Hunting	2
Timber merchants	Remote	Timber	2
Fire Service	District Fire Office – Nkawie	Protection of biological resources	2

(Adapted from Kyereh 2007)

4.2 Overview of existing NTFP studies that refer to Ghana's HFZ

Each of the following case studies represents good examples of NTFPs in Ghana. Three of these studies refer to specific NTFPs that can be found in Ghana's HFZ. The first study, Townson's (1995) report, *Incomes from NTFPs: patterns of enterprise activity in the forest zone of Southern Ghana*, provides insight that is relevant to the research that was carried out for this thesis. This extensive study looks primarily at the economics behind NTFPs, focusing on distribution, the entrepreneurs involved, raw material supplies, the markets and the demand for the products. The following are some of the conclusions brought out from the study:

- The pattern of household involvement in NTFP income earning activities, marketing conditions and access to markets appear to have an important influence on the level of involvement in any particular area (especially for those relying on income from wrapping leaves, bushmeat and baskets).
- By far the majority of entrepreneurs rely on the NTFP-based activity for only part of their income; only about 10% of the respondents? relied solely on NTFPs as their only source of income.
- The majority of those surveyed stated that they obtain at least half of their income from agriculture.
- A final conclusion from the survey results suggest that the major factor responsible for reduced raw material availability is the unsustainable exploitation of the resource, predominantly by local communities (Townson 1995).

The final conclusion from Townson's research is particularly relevant for the case studies mentioned below. Declining resources due to lack of sustainable management is also an issue for both of the two villages that I visited during my fieldwork.

4.2.1 The leaf Gatherers of Kwapanin

The *Marantaceae* plant is found in most of the forests in southern Ghana. It is important because its leaves are large, strong and impermeable and they are used widely throughout the country as wrapping material for different foods (Agyemang 1996). Due to devastating bushfires and environmental degradation in the 1980s, much of the rural community turned from farming to collecting and processing non-timber forest products, such as the leaf gatherers of Kwapanin, a village of about 1200 people located in the Ashanti Region or southern Ghana (Agyemang 1996). Most of the collection takes place inside forest reserves and it is mostly women and children that do the collecting. In terms of trade there are three options for the women: sell the leaves in the village, sell to buyers (or middlemen) or sell directly at the market themselves. The leaves are harvested



Figure 4.2: Mr. Amos, the village assemblyman in Kyekyewere, showing me some wrapping leaves

with no apparent damage to the forest: during the dry season the sites are left free, allowing time for regeneration (Agyemang 1996). Unlike the following examples this system seems to avoid NTFP overexploitation.

In a follow-up study, Agyemang (1996) conducted research in which he examined the results of an experiment to modify the Forestry Department's NTFP permit system, focusing specifically on the leaf gatherers of Kwapanin. The permit was in need of modification for the following reasons:

- The leaf gatherers felt that they were being unfairly harassed by forestry officials in the village, at the market and in the forest;
- The process of obtaining a permit to collect the leaves was cumbersome: harvesters had to travel hours from Kwapanin to Kumasi where it was difficult and expensive to find transportation;
- Permits were issued for a maximum period of one month;
- Many gatherers had to share permits because of lowered market prices, forcing them to collect leaves on different days (Agyemang 1996).

As a result many villagers began to illegally enter the forest reserves to collect leaves, which inevitably further embroiled the situation between locals and forest officials.

The outcome of the modified system seems to have been a success. Villagers were asked how the current arrangement could be improved, suggesting that the current permit system needed restructuring. The permit system was changed to a registration system, which meant one only had to register once every six months and was much cheaper than having to acquire a permit. Leaf gathering associations were also set up to help identify and monitor any problems that the collectors may have when working (?) in the forests. Ultimately, the modified system yielded positive results. It improved the relationship between forestry officials and rural populations, it helped to generate the villagers' interest in the protection of the forest reserve and it helped financially, as most households were able to send their children back to school again (Agyemang 1996).

4.2.2 Rattan

Whereas the *Marantaceae* leaf trade industry takes place primarily within Ghana, rattan is used globally and trades in excess of US\$ 6.5 billion annually (Oteng-Amoako and Obiri-Darko 2000). According to Oteng-Amoako and Obiri-Darko (2000) however, the rattan industry of Ghana and other parts of Africa "has long been neglected." The authors argue that there is enormous potential for rural economies in Africa to benefit from rattans, however the majority of the trade now comes out of Southeast Asia. If rattans are in abundance, what then is keeping countries in Africa from entering the international market?

Based on their study in Ghana, Oteng-Amoako and Obiri-Darko (2000) conclude the following: "The industry is threatened by over-harvesting, poor quality raw rattan stems, inconsistent quality of rattan products and national policies which appear to stifle the industry and dampen the aspirations of collectors, weavers and traders alike." The authors contribute to the overall debate on NTFPs in that they believe if rattan is sustainably developed it can have the potential to alleviate poverty by

serving as a source of income for rural people (Oteng-Amoako and Obiri-Darko 2000). The question remains: How can rattan be harvested sustainably?

At the time of their findings, Oteng-Amoako and Obiri-Darko (2000) found that over-harvesting and poor management of rattans had contributed to acute shortage of raw rattan species. According to Sunderland (2004:72), “Harvesters indiscriminately cut everything from the rattan's base clump, even the young stems, just to get at the mature cane, but this doesn't allow the clump to re-grow and produce new stems for future harvests.” In order to trade at the global level though, many feel it is the government's responsibility to educate the rattan entrepreneurs, do away with the permit system and help establish participatory associations, much like the leaf gatherers of Kwapanin (Oteng-Amoako and Obiri-Darko 2000). Such associations could “assist with fostering unity and good relations among members, controlling raw material prices, regulating and encouraging sustainable harvesting practices to protect existing wild stocks, and promoting rattan cultivation and plantations” (Sunderland 2004:76).

Currently, Ghana's Ministry of Lands and Natural Resources is promoting the use of rattan as an income alternative due to the lack of wood in the country (MLNRa 2009). According to the forestry sub-sector, it is doing so by training people to use rattan to construct furniture (MLNRa 2009). Unfortunately the Ministry does not mention anything about sustainable harvesting practices. Without any sort of effective policy it is highly doubtful to maintain a sustainable resource base, such as rattan in Ghana (Oteng-Amoako and Obiri-Darko 2000). Lack of regulation and overexploitation are also themes present in the following NTFP examples.

4.2.3 Chewing sticks

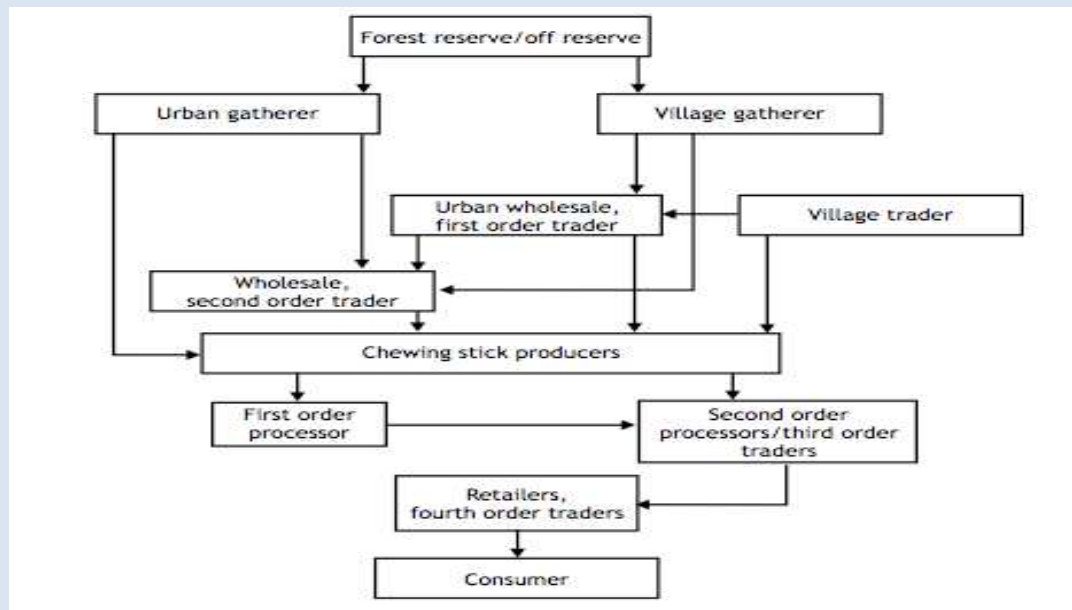
It can be argued that the main contributing factor of good dental health in West Africa, particularly Ghana, is due to the high use of chewing sticks (Blay 2004a). Chewing sticks are an important forest product, which can be found in most households and are commonly used in the mornings and after meals. Blay's (2004b: 25) research suggests that, “in addition to the provision of dental care, chewing sticks contribute to the income of many Ghanaians and at the same time contribute to local, regional and national economies.” Because so many people use chewing sticks it is no surprise that there exists a wide trade network involving many different actors from both rural and urban communities. Figure 4 .3 shows the chewing sticks trade network in Ghana.

Chewing sticks are made from a variety of tree species, however studies show that the resource base is gradually dwindling (Blay 2004b). The reasons for resources scarcity are similar to those in the case of rattans. The harvesting techniques are currently unsustainable, processing associations do little in terms of effectively regulating the activities of businesses and the legal permit system on forest reserves is not strictly monitored (Blay 2004b). All of these issues must be addressed because they all affect one another. If, for example, there is no regulation of permits then it is possible for anyone to go into a reserve and collect the trees used for the chewing sticks. Should all the tree species (used for chewing sticks) in a particular forest reserve be depleted then the harvester can simply go to another reserve to collect more trees. If the permit system is strictly monitored though, meaning that harvesters are forced to collect from only one forest reserve, one could assume that there would be an incentive to manage the resource sustainably.

The depletion of the tree resources used for chewing sticks is having adverse effects on people's livelihoods in Ghana. “It now takes more than a week to find enough trees in the forest to harvest

one truckload of about 200 stems” (Blay 2004a: 64). To meet the demands for the Ashanti region alone, in one month some 4,700 trees are harvested into 12,000 – 19,000 stems (Blay 2004a). As a result of overexploitation much of the harvesting now takes place outside of the country, which has left many without jobs. Scarcity has also driven prices up, making it difficult for households to purchase and benefit from the chewing sticks.

Figure 4.3: Chewing stick trade network:



(Blay 2004a)

Blay (2004a, 2004b) does have some suggestions in order to sustainably harvest the different tree species used for chewing sticks: There needs to be inventory measures put in place in order to stock the current rate of exploitation. There needs to be scientific data available on the regenerative capacity of the species (rate of growth). There needs to be appropriate resource management policies but in place that are legally enforced by the Forestry Commission of Ghana. Chewing stick trade associations need to effectively regulate the activities of businesses. Finally, there should be more efforts to establish plantations for the different tree species used for chewing stick production.

4.2.4. Bushmeat

The bushmeat trade is an integral part of Ghanaian culture. It plays an important role in people’s livelihoods, especially to rural households. Every year in Ghana the bushmeat trade is estimated to be worth US \$200 - \$300 million (CRMU 2004). Bushmeat is more expensive than meat that comes from domesticated animals, such as goats, sheep, cows or chickens, with most people preferring the taste of the former to the latter. There are known to be some 10-25 different bushmeat species that are sold in Ghana’s markets, including pangolins, porcupines and monkeys (Cunningham 2004). Most of the bushmeat is hunted and gathered in rural areas, then traded and sold in urban areas. This is

because incomes in urban areas are generally higher than those in rural settings, which means that people in cities can afford to buy bushmeat more regularly (Cunningham 2004).

Figure 4.4: Poster, from Kakum National Forest, promoting awareness of illegal bushmeat trade



Bushmeat is an important non-timber forest product worth special attention, in that “the trade is as much of a concern to conservation agencies as it is to those looking at local livelihoods and development” (Cunningham 2004:6). In their study, Mendelson *et al.* (2003) examined the bushmeat commodity chain in Takoradi, Ghana’s third largest city. Five primary actors in the bushmeat trade were identified: commercial hunters and farmer hunters, which are mostly men based in local rural areas, and wholesalers, market traders and chop bar owners, all of whom are women based in the city (Mendelson *et al.* 2003). The study shows that the hunters make significant profits while the urban actors make relatively small profits. This is due mainly to the fact that the “costs of participating in the trade appear to be lowest for hunters and highest for chop bar owners” (Mendelson *et al.* 2003:73). Much of their research yielded similar results to those of the rattan and chewing sticks trade. In Takoradi and other parts Ghana the bushmeat trade is largely unregulated by state and local institutions. Even though there are certain institutions that are responsible for the implementation of licenses for guns and permits for

trade, very rarely in Ghana are these practices acknowledged (Mendelson *et al.* 2003). Ghana’s Department of Game and Wildlife has put seasonal bans on some species in an attempt to lessen the impact of the trade on wild animal populations. This is intended to “protect the animals from being hunted at a time when they are pregnant or have recently borne young” (Cunningham 2004:8). Most studies have shown however, that because the demand is so high for bushmeat that very few people ever respect these legislative measures (Mendelson *et al.* 2003, Cunningham 2004).

The unsustainable practices occurring within the bushmeat trade are having adverse effects for both rural and urban populations. Instead of keeping some of the bushmeat for themselves and selling some for income, rural households are trading almost all of their bushmeat now because of the growing demand and high rates they can receive. The drawback of this is that people in rural areas are getting less nutritional value in their diets (Cunningham 2004). Also, as in the cases above, lack of regulation has led to resource scarcity, and unlike plants, when animals are overexploited there is a major fear of extinction of the species altogether. One final negative effect that Cunningham (2004) points out is that more hunters are using poisons to trap animals, thus contaminating much of the bushmeat found in urban markets.

4.3 Summary

Of the case studies mentioned above, only the leaf gatherers have shown the possibility for sustainable exploitation of the resource in question. This is because of an experimental registration system that was implemented which took over from the permit system. Unfortunately the study is

slightly outdated now and I have yet been able to find a follow-up study on the leaf gatherers of Kwapanin. The other case studies share a common theme: overexploitation due to a lack of sustainable management has led to dwindling stocks of resources. The outcomes from the chewing stick, rattan and bushmeat case study prepared me for my visit to Ghana and unfortunately, my data confirms that dwindling resources are still very much a problem for rural communities today in Ghana's HFZ. This goes for both on and off-reserve areas.

V. Policies and governance arrangements relating to non-timber forest products

5.1 Overview of relevant forestry and NTFP related policies in Ghana's High Forest Zone

Ghana's forestry history dates back to 1906, during the colonial period, when legislation was enacted to control the felling of commercial tree species (MLNRb 2009). Around that same time, the process of reservation began, in the form of both forest reserves and game reserves. This was a result of the beginning of large scale cocoa farming, which saw large tracts of land, including forests, completely destroyed in order to make way for the plantations (FC 2008). The Forest Reserves eventually became to be managed by the Forestry Commission through the Forest Services Division while the Game Reserves are also managed through the Forestry Commission, but through the Game and Wildlife Division. Even though NTFPs are found in both Forest and Game Reserves (e.g. canes and bushmeat), both are managed differently according to which Division's jurisdiction is responsible. For example the procedure for acquiring a permit to remove forest produce is far different than that of obtaining a hunting license.

With the inception of the Reserve system, it was taken for granted that forest cover and benefits had been adequately secured (FC 2008). After the creation of the reserves, not much attention was paid to the off-reserve areas. To date, there are very few laws and regulations for forests and NTFPs outside the reserves. Like the bushmeat and chewing stick case studies mentioned in the previous chapter, the neglect of the areas outside reserves has contributed to the overexploitation and the decline of many of Ghana's forests and NTFPs. The off-reserves were used and cleared with no systematic plan for regeneration, with the result that between the time of reservation and the end of the twentieth century, Ghana lost about 60% of her forest cover (FC 2008). This percentage has, unfortunately, most likely increased in the past decade, due to activities such as illegal logging and overexploitation of forest resources (see Appendix 1).

There are no specific laws, acts or decrees that deal directly with NTFPs; instead they are usually only mentioned vaguely in small sections of larger pieces of legislation. When NTFPs are mentioned it is usually in the form of 'forest produce or products' or inferred simply as 'natural resources'. On top of that, the written laws at times can be quite contradictory. Below are a few of the statutes from the 1994 Forest and Wildlife Policy from the Ministry of Lands and Natural Resources:

Table 5.1 Two statutes from 1994 Forest and Wildlife Policy

In enunciation this policy concerning the country's forest and wildlife resources, the Government of Ghana recognizes and confirms:
Section 3.2.1 – The rights of people to have access to natural resources for maintaining a basic standard of living and their concomitant responsibility to ensure the suitable use of such resources.
Section 3.2.9 – Forest and wildlife fees and taxes are considered as incentives to encourage more rational and less wasteful utilization and should be revised according to market forces, and particularly to increase production of value-added wood products for export.

The first section mentioned refers to people's customary rights. Article 11 of the 1992 Constitution lists common law as part of laws of Ghana and cites rules of customary law as part of common laws of Ghana. Article 11(3) states, "for the purposes of this article, 'customary law' means the rules of law

which by customs are applicable to particular communities in Ghana (Marfo 2009).” The second section is what can be considered statutory law, which is law that is recognized and handed down by the state, or central government. Often there is confliction between customary and statutory law. Marfo (2009) suggests that the recognition of customary law presents Ghana as a dual legal political entity where issues of rights can be contested by statutory and customary laws. In a sense, the two sets of laws often butt heads with one another. In fact, it has been observed that the most common conflict associated with forest reserves is between the Forest Service and people who enter the farm illegally or to harvest non-timber forest produce (Agyeman 1994).

5.2 Rights to extract, plant, manage and transport

The right to extract, plant, manage and transport NTFPs fall under the NTFP permit system, which is only relevant for Forest Reserves. The reasoning behind the permit system is to help manage the amount of NTFPs that can be taken out of forest reserves. Fees on permits to collect NTFPs in the Forest Reserves are charged by District Forest Officers (Treue 2009:96). The rates for the permits are, in principle, set on the basis of an annual review of wholesale market prices, but, in reality, there are large variances for the same product from District to District (IIED 1993:99). It is also possible that there is not an annual review of wholesale market prices for each NTFP, which would not allow for fair and accurate fees for issuing permits. On top of this there are some discrepancies regarding the legal basis for the Forestry Department to charge any fees at all for permits to collect NTFPs. Treue (2001) notes that section one in The Forest Protection Decree (1974) makes it illegal for anyone to collect and extract such goods for the forest reserves without written authority for the Forestry Department. However, the Forest Protection Decree (1974:1(4)) states “nothing in this section shall prohibit the exercise in a Forest Reserve by any person of any right under the Forest Ordinance (CAP 157) for the time being is, or is treated as an admitted right”.

More explicitly, unless it is an admitted right, permission is needed to take more than what is required for domestic use from a Forest Reserve. From those that I spoke with, it seems that ‘more than what is required for domestic use’ is at the discretion of the Forest Officer. Moreover, proving that one is acting in accordance with an admitted right can be rather difficult to prove. “Such rights and the persons holding them should be described and publicly announced when individual forest reserves are gazetted” (Treue 2001:96). Such a task can be difficult to accomplish since many of the reserves were created over 50 years ago. This formulation is copied from the very much-outdated Forest Ordinance (CAP 157. 1927:23), which protects existing admitted rights within forest reserves (Treue 2001:96). It states that the burden of proof that any good has not been illegally extracted from a forest reserve lies upon the person in whose possession it is found (Forest Ordinance (CAP 157), 1927:31).

Trying to decipher different laws and decrees is quite a challenge, especially when some texts date back to the 1920s. For the purposes of this research thesis what is important to know is that a permit is needed to collect NTFPs from a Forest Reserve. As I will point out in Section 5.3 of this chapter, not everyone goes through the process of obtaining a permit from the Forest District office. There are multiple reasons for this, the most common of which is the cumbersome procedure for acquiring permits (Agyeman 1994). Should one not acquire a permit or be given access rights to enter and remove forest products from a reserve then there are invariably consequences. Table 5.2 highlights Section 22 from CAP 157 (1927) which gives the details of such forest offences.

Table 5.2 List of forest offenses from the Forest Ordinance CAP 157:1927

Prohibitions of community access and withdrawal rights in forest reserves by CAP 157.
Any person who, in a Forest Reserve, without the written consent of the competent forest authority:
fells, uproots, lops, girdles, taps, damages by fire or otherwise damages any tree or timber;
makes or cultivates any farm or erects any building;
causes any damage by negligence in felling any tree or cutting or removing any timber;
sets fire to any grass or herbage, or kindles a fire without taking due precaution to prevent its spread;
makes or lights a fire contrary to any order of the Forestry Commission;
in any way obstructs the channel of any river, stream, canal, or creek;
hunts, shoots, fishes, poisons water, or sets traps or snares;
subjects any produce to any manufacturing process, or collects, conveys or removes any forest produce; or
pastures cattle or permits any cattle to trespass;
Commits an offense and is liable on summary conviction to a fine not exceeding 500 penalty units or to imprisonment not exceeding 2 years or both, except that for a second or subsequent offence under this section the offender shall be liable on summary conviction to a fine of not less than 250 penalty units or to imprisonment not exceeding 2 years or both, except that for a second or subsequent offence under this section the offender shall be liable on summary conviction to a fine of not less than 250 penalty units or to imprisonment not exceeding 3 years or both.
NOTE: Now, fines are stated in penalty units, on which a monetary value is placed. Currently, a penalty unit is 12.00 GHC (FC 2008). [€5]

Aside from needing permission to access and extract the NTFPs, there is very little written information covering people's right to plant, manage and transport NTFPs. Having talked with members from the community, they seemed to be unaware that they could plant certain species of NTFPs, such as pestles. The issue of transport becomes relevant when discussing the commercial use of NTFPs. People seemed less concerned with getting the NTFPs (such as pestles and raffia palms) back to their village and more so with getting them from their village to the markets. Since customary access and use rights is only granted for domestic purposes, people are not technically allowed to extract NTFPs from the Reserves and then transport and sell them in markets. Having said that many people had no knowledge of the specific laws regarding the transport of NTFPs. This will be discussed further in the following section.

If we discuss management of resources off-reserve, we must first briefly make mention of ownership. Land outside the reserves is owned by different groups (stools, clans, families),

institutions (schools), individuals (including migrants) or the state (FC 2008). The Constitution (1992) confirms that any of these entities have the right to legally own land under the laws of Ghana. The Forestry Commission (2008) states that whoever owns these lands also owns what is on these lands, including having the legal rights over forests located on the land. However, there are limitations to such ownership. Here, the blurred line between customary law and statutory law appears again. While people have legal rights over the land, they do not have legal rights to natural resources such as minerals and timber, which are vested in the State. Of the remaining natural resources available, Article 269 (Ghana 1992) requires sectoral commissions, such as the Forestry Commission, to regulate and manage the use of the natural resources concerned, and to coordinate policies in relation to them (FC 2008).

For the most part, these laws are known and understood by those who live in and adjacent to the Forest Reserves. This understanding is manifested primarily through fear of being in the Forest Reserve without a permit and the fear of committing a fineable offence, as noted above in the prohibitions section. The community members in Kyekyewere however, seemed less inclined to feel the need to attain a permit to enter the reserve. This is primarily due to their location. They are completely surrounded by the Forest Reserve, with their admitted farms bordering the reserve boundary. Also, because they are more or less isolated with only one very poor road leading to the settlement, acquiring a permit is even more cumbersome than normal. Finally, the people stated that the Forest Officers rarely even visited the village to check on things like permits.

5.3 Rights in practice: a summary of household survey data and interviews

This section gives a summary of some of the household survey results. Due to nature of the survey (Appendix 4), many sections were left blank, because they were simply not applicable to the respondents. Many of the questions were, however, open-ended, which allowed for further elaboration. Thus, I am treating these household surveys as semi-structured interviews, in which many respondents were eager to share some of their stories regarding the extraction and management of and access to NTFPs. After reading through the results I discovered that many of the answers from both communities were similar. Therefore, I am providing the results from both communities here altogether, only distinguishing between the two (Kyekyewere and Kunsu Dotiem) when necessary. I will end this section with a personal testimony of a man from the third community I visited, Sefwi Abrabra, where I conducted some pilot questions. The questions from the survey that deal with specific NTFPs regarding domestic use and trade will be included in part VI and VII of the thesis. The biodata from the surveys for both villages is listed in the below table.

Table 5.3 Biodata from household surveys

Village	Male/Female Respondante	Age Range	Average Age ³	Occupation
Kyekyewere	60% M / 40% F	18 – 73	42.8 yrs.	Farmer (69%), trader, student, carpenter, chainsaw operator, teacher, seamstress, hairdresser, unemployed

³ Some possible explanations for such high average of respondents: (1) Many community members had already left for their farms by the time we started conducting the surveys. (2) Many youth leave the village to immigrate to urban areas.

Kunsu Dotiem	56% M / 44% F	26 – 80	49.4 yrs.	Farmer (88%), driver, teacher, trader
--------------	---------------	---------	-----------	---------------------------------------

5.3.1 *Within this household, who has the right to collect NTFPs?*

The responses here were mixed, but for the most part respondents stated that everyone in the household had the right to access the Forest Reserve for NTFPs. Many conceded that it is the men in the communities who primarily entered the Forest Reserve to collect NTFPs simply because the women and children are not strong enough to carry some of them (e.g. pestles and bundles of canes). Some, however, stated that only men were able to go into the FR because it was too dangerous for women and children. When asked why, the main reason given was that men were the only ones willing to take the risk of being in the Forest Reserve without permission. The female respondents stated that they were afraid of being in the FR illegally.

5.3.2 *Are permits required to extract any of the NTFPs for domestic or commercial use?*

Here it is worth distinguishing between the responses from both communities. From the village of Kyekyewere (the admitted village inside the GSBA), not one single respondent stated that they needed permits to enter the FR and gather NTFPs. I believe this is because the people have an admitted right to enter the reserve to collect NTFPs for domestic use only.

The responses were more varied from the village of Kunsu Dotiem. This is probably due to the fact that this community is located just outside the reserve, with the option of not only entering the reserve but also to collect NTFPs from fallow land in the off-reserve area. Most of the respondents were aware that they needed permits to enter the reserve to collect and extract NTFPs. Specific NTFPs listed were pestles, canes, small trees for chewing sticks and bushmeat (in the form of a hunting license). There were those that said they did not require a permit to access and collect NTFPs. Of these, three main reasons were given: they collected the NTFPs outside of the reserve in which a permit is not required, they collected from the Forest Reserve but intended to use the NTFPs for domestic use only (in which case a permit is not needed) and finally one person rather honestly responded by stating that they never bothered with permits because there is simply less supervision over the permit system itself. This point was reconfirmed throughout the research experience with others informing that some time ago (between 5-15 years), there were more forest officers present, patrolling the Forest Reserve areas. Today, at least with the Tano Offin FR, there is only one forest manager and a handful of officers in charge of an area of approximately 413.92 km². That seems to be quite a large tract of land for only a few people to monitor.

5.3.3 *Are there any restrictions in place to plant certain NTFPs?*

This question received far more responses than I imagined. The question itself also stimulated extra dialogue between the research assistants, the respondents and myself. Here people interpreted the word 'plant' loosely, taking it to mean harvest and the rearing of animals (bushmeat) as well. From both Kyekyewere and Kunsu Dotiem, almost all the respondents stated that there are no restrictions to plant certain species of NTFPs, even within the Forest Reserve. Because they also stated that they experienced a dwindling resource base for many of the NTFPs (such as pestles, mushroom, palms, snails, and practically all bushmeat), the respondents had a strong desire to plant, grow and rear certain NTFPs. The problem is that the people in these communities have no knowledge about how

to achieve this. Many stated that they would like technical advice from the Forest Services Division about how and what they could plant.

The most common NTFPs listed were pestles, palm, snails and grasscutters. Pestles play an important role in the daily process of making *fufu*, the staple food of these communities made of starchy root vegetables like cassava and cocoyam. The problem with the pestle plant is that it does not coppice, which means once it is cut it will not regenerate. Palm and canes are very important because they are so versatile in use (roofing, drying mats, fish traps). Also, as noted earlier, bushmeat plays an important role in the diet of many forest communities. Bushmeat not only offers rich sources of protein, but also can fetch a high price at local markets. Further information about the growing of snails and grasscutter rearing will be explored in part VIII of the thesis, in the alternative livelihoods strategy section.

5.3.4 *Is there any registration system put in place for the access to and extraction of certain NTFPs?*

The main reason I included this question in my survey stems from the case study of the leaf gatherers of Kwapanin. It seemed like a successful attempt at fixing what was a damaged permit system regarding the *Marantaceae* plant and its leaves. Aside from the occasional response involving a hunting license, the answer to this question was unequivocally ‘no’. I found this to be interesting and I will explore the issue of creating a registration system instead of a permit system in the recommendations section of the final chapter.

I end this section with an account of one man that spoke of his experience of obtaining a permit from the Forest District office. The interview took place in the community of Sefwi Abrabra, in the Sefwi Wioso Forest District. The village was off-reserve but fringed a nearby Forest Reserve area. In this community I was given a chance to pilot some of my questions for my survey, as well as speak personally with a few of the community members.

Personal testimony from man in Sefwi Abrabra, Sefwi Wioso FD, Western Region, Ghana:

“A few years ago I went to the Forest District office to get a permit because I wanted to cut down one (small) tree in the forest reserve. When I entered the office I had to give my name, a description of myself and the village I was from, and the reason why I wanted to cut the tree down. I was given permission to cut the tree down so long as I promised to use it only for domestic purposes and not for selling it. The permit cost me 500,000 cedi (today’s currency about 50 GHC, or about 20 euros). “

This man explained to me that they charge you each time for each tree, and that today the price for the permit would be much higher. He said that they generally grant the permits and that they charge you depending on the size of the tree and the species.

The major issue with the permit system that many people seemed to have was that they had to travel too far and too frequently in order to obtain a permit. The distance between a particular Forest Services Division office and a community can be quite far. Others seemed to have no idea about the permit system, or wondered why they needed permission at all to enter the Forest Reserves.

5.4 Summary

Forest policy in Ghana formally began in the beginning of the 20th century with the creation of forest reserves. The policies are now regulated by the FSD and the FC. No formal policies are in place for NTFP collection in off-reserve areas, which has contributed to the depletion of many forest resources. Regarding general forestry laws, there are some problematic features relating to forest governance in that often communal rights and statutory law seem to contradict one another. More specifically, the permit system is the only policy in place for the extraction of NTFPs from forest reserves. Customary law gives those living in a FR the right to take forest produce for domestic purposes only. Permission is needed in order to extract NTFPs for commercial use, whether one lives in or adjacent to a FR. However, it seems that very few people go through the process of obtaining a permits because of the burdensome procedure involved (travel time and costs). The following chapter goes into detail about the specific NTFPs that are extracted in the Tano Offin FR.

VI. NTFP Extraction in the Tano Offin Forest Reserve

In this chapter I seek to discuss the main NTFPs that are extracted and used within the Tano Offin Forest Reserve. Here, I look at the various species of plants and animal NTFPs, the methods used to extract them, how they are utilized (domestically and commercially) and what they are used for. The idea of this chapter is to highlight the importance of NTFPs in the livelihoods of the communities that I visited. This chapter will help to prepare for the subsequent chapter, in which I examine the relative contribution of NTFPs to people's livelihoods in terms of cash and non-cash incomes.

6.1 Uses of some major non-timber forest products

In this section the aim is to better illustrate some of the more common NTFPs that are extracted and used in both of the study sites. Because there is such a wide range of products that are used by the people in Ghana's HFZ I will only highlight a few of the most common categories of NTFPs.

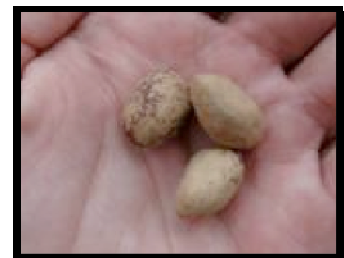
6.1.1 Food

Forest food contributes significantly to the diet of many rural communities (Falconer 1992). While the communities of Kyekyewere and Kunsu Dotiem rely primarily on food that they farm, the survey results maintain the fact that many NTFPs are used for consumption



Figure 6.1 and 6.2: Spices and nuts from Kunsu Dotiem.

still today. An assortment of wild peppers and spices are used to add extra flavor to the starchy traditional staple dishes such as fufu. Both villages also made it known that wild mushrooms are also very popular, although dwindling resources has made this NTFP rather scarce. Seeds and nuts also add to the diversity of rural diets, and often in periods of scarcity, for example due to poor crop yield, these NTFPs can act as substitutes for staple foods (Falconer 1992).



Practically every single person that participated in the survey and the PROFOR activities stressed the importance of bushmeat to their diet. The main reason they voiced their opinions so heavily on the issue of bushmeat is because it has become so scarce. Species like grasscutters, snails, crabs and antelope used to be regularly consumed a few times a week in these communities, but now it has become much more difficult to obtain such animals. Many stated that this was due to forest degradation while others thought that it was simply because of overpopulation (especially in Kyekyewere). In Kunsu Dotiem, one of the village elders recalled a time when animals such as monkeys and chimpanzees were frequently consumed, however these animals have virtually disappeared from the forests of the Tano Offin Reserve.



Figure 6.3: Women in Kunsu Dotiem talking about traditional medicines.

6.1.2 Medicines

Many NTFPs are used for medicinal purposes, although local knowledge of the traditional practices seems to be fading. One reason for this seems to be that Western medicines are becoming more accepted in the rural communities because they are becoming increasingly easier to access and afford. Another reason for the decline of traditional medical treatments is due to the degradation of the forest and fallow environments (Falconer 1992). In a follow-up visit to Kunsu Dotiem, a few of the women of the village spoke about their knowledge of plant medicines, but stated that not many people came to them anymore or bought medicine from them.



Figure 6.4: A large piece of resin, which is burned as incense.

Medicines that are found in the forests and nearby are used for a variety of treatments, both curative and preventive. I learned that the bark from certain trees (if it is bitter) is often added to hot water to make a soup, which can cure stomach pain. Incense, in the form of gum and resin that falls from certain trees, is also very important to certain rural communities. The people in Kunsu Dotiem explained to me that incense is often used in ceremonies and on special occasions. Forest medicines and incense are often sold to local and regional markets as well. It seems that even though Western medicine has become more popular, there are still certain natural medicines that hold high value amongst both urban and rural people.

6.1.3 Construction and household goods

In Ghana, there exist many available building materials, however such materials are often too expensive for rural communities.



Figure 6.6: Man from Kunsu Dotiem showing his fishing trap made from canes and palm



Figure 6.5: Typical rural household; Kunsu Dotiem.

Non-timber forest products can be used as alternative building materials and have done so for many years. Figure 6.5 shows a house from Kunsu Dotiem, which is typical of the village. Its walls are made of mud and wattle (poles interlaced with twigs and branches) and its roof is constructed using raffia palm and bamboo or cane, which is thatched together. Falconer's (1992) study shows that metal sheeting is also used for roofing in many rural communities although it is more expensive.

Everyday household goods such as utensils, bowls, mats, brooms, baskets and grinders are often made rather than purchased and are constructed from NTFPs such as canes, poles and palms. The most important household good that is used in both Kyekyewere and Kunsu Dotiem is the pestle, which is used to make the staple dish, fufu. It is made from a tree and is used to pound the plantain

and yams. Figure 6.6 shows a proud man from the village of Kunsu Dotiem. He showed me his fish trap that he made from canes and uses to catch fish from a small stream that runs nearby the village. Once the fish go into the trap they are unable to swim back upstream. The man also said that he catches crabs occasionally, but that there were less and less these days.

6.2 Other NTFPs extracted in on and off-reserve areas (Kyekyewere and Kunsu Dotiem)

This list shows some of the NTFPs that were listed in the household surveys. It was compiled and put together with the help of my research assistants and my local supervisor. Many of the NTFPs listed below (especially the fauna), represent the forest products that the communities have been seeing less of over the years. The surveys confirmed the importance of spices to the diets of the rural communities. Since they are limited in terms of range of different food products, spices such as peppers play an essential role in the preparation of meals.

Table 6.1 List of some plant and animal NTFPs from the research area.

NTFPs - FAUNA (ANIMALS)		
LOCAL NAME	COMMON NAME	SCIENTIFIC NAME
OWEA	TREE HYRAX	<i>Dendrohyrax dorsalis</i>
OWIO	BAY DUIKER	<i>Cephalophus dorsalis</i>
AKRANTIE	CANE RATE	<i>Thryonomys swinderianus</i>
OPURO	WESTERN PALM SQUIRREL	<i>Epixerus ebil</i>
APRAA	LONG TAILED PANGOLIN	<i>Manis tetradactyla</i>
APESE	BUSH-TAILED PORCUPINE	<i>Atherurus africanus</i>
ADOWA	OGILBY'S DUIKER	<i>Cephalophus ogilbyi</i>
	RED-FLANKED DUIKER	<i>Cephalophus rufilatus</i>
MAMPAM	EMERALD TREE MONITOR	<i>Varanus prasinus</i>
WANSANE	BUSH BUCK	<i>Tragelaphus scriptus</i>
NTFPs – FLORA (PLANTS)		
LOCAL	COMMON NAME	SCIENTIFIC NAME
FOM WISA	ALLIGATOR PEPPER	<i>Aframomum melegueta</i>
HWENTIA	NEGRO PEPPER	<i>Xylopiya aethiopica</i>
EHYE	SHEDUA TREE	<i>Guibourtia ehie</i>
PREKESE	*No common English name (spice)	<i>Tetrapleura tetraptera</i>
ANWONOMO	WRAPPING LEAVES	<i>Marantochloa manni</i>
		<i>Megaphrynium spp</i>
		<i>Thaumatococcus daniellii</i>
ESRO WISA	WEST AFRICAN PEPPER	<i>Piper guineensis</i>
ODII	*No common English name (bark used as medicine)	<i>Okoubaka aubrevillei</i>
WEDEABA	BLACK AND WHITE PEPPER	
AKANKYEA		
ATOTO (KAGYA)	Seeds, used as herbal supplement	<i>Griffonia simplicifolia</i>
AHABAYERE	WILD YAM	<i>Dioscorea villosa</i>

6.3 Summary

My intention in Chapter 6 has been to paint a picture of the communities I visited with reference to the different non-timber forest products people use in their daily lives. Not only are NTFPs utilized as foods and medicines, but they also play an important role in the use of construction materials for houses and tools as well as household goods like sleeping mats and brooms. All of the photos were taken during my time in the field, in which everyone was very happy to show me the various NTFPs and how they use them in their daily lives. I think it is very important not to underestimate the local knowledge the rural communities such as Kyekyewere and Kunsu Dotiem possess when it comes to how they make use of the forests. For me it was especially interesting to hear the stories about the use of local medicines, although sadly it seems the practice is slowly fading away.

This chapter has showed how people make use of the various NTFPs in their daily lives, from foods to medicines to construction and household goods. The following chapter explores the relative contribution of NTFPs to people's livelihoods. Here, the PROFOR livelihoods analysis results are presented.

VII. The contribution of NTFPs to people's livelihoods

In order to demonstrate the contribution of NTFPs to people's livelihoods I will first show the results of the PROFOR activity that was completed with both villages, Kyekyewere and Kunsu Dotiem. After providing the charts and tables I will give my analysis of the results. The results are based on the group work with 20 participants from each village. My local supervisor, Mr. Thomas Insaidoo, and myself agreed to ask the village assemblyman help us to locate the participants for the PROFOR activity. Our main criterion was to find people that were not from the same household. The groups were split into two, 10 male participants and 10 female participants. For the admitted village of Kyekyewere I also include the analysis that shows the proportion of cash and non-cash benefits to the people's livelihoods. These results are also given from both the female and male groups.

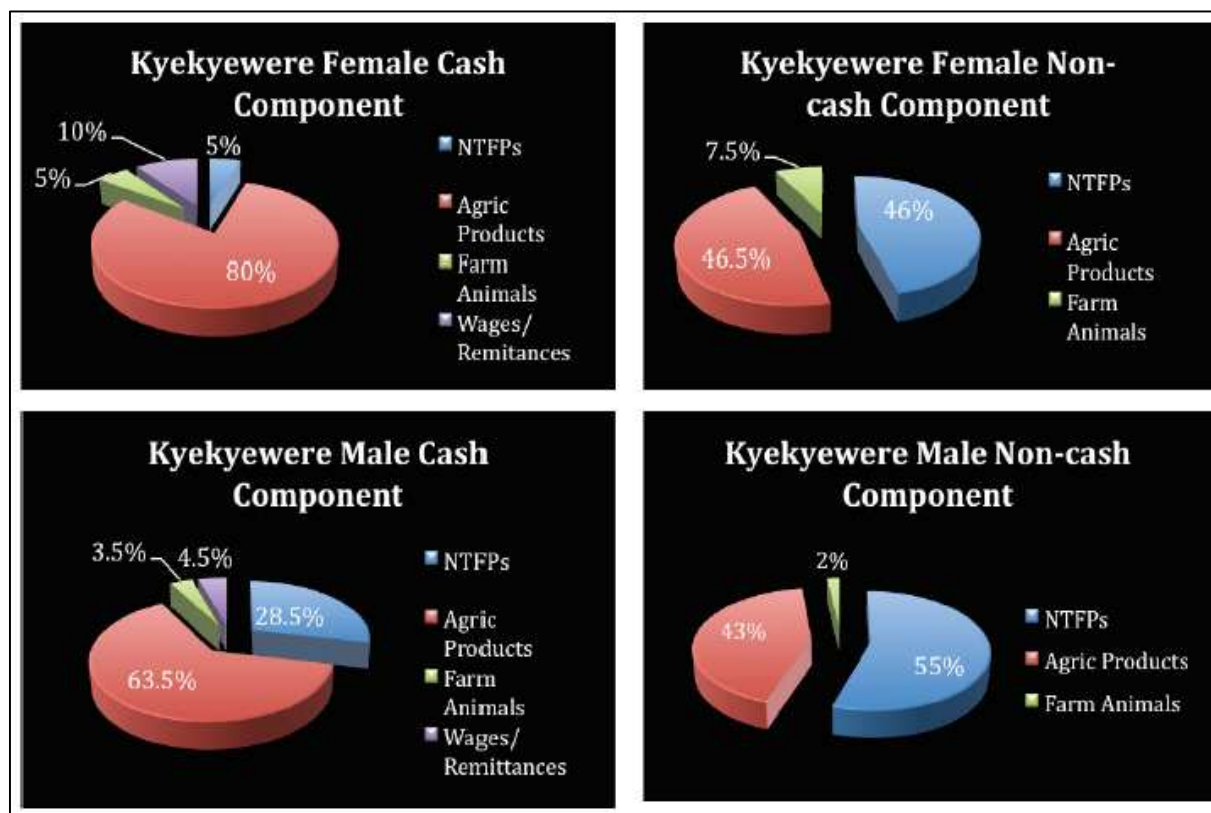
We explained that, by a household's annual income we meant all the resources a household needs to get through the year successfully. Here, income is not meant solely in monetary terms. Guided by PROFOR (2008), the following make up a household's annual income:

- All the items grown on farms or gathered from forests or other off-farm natural resources, and are sold.
- All the items, grown on farm or gathered from forests or other off-farm natural resources, and are consumed or used at home without being sold.
- Money received through wages or through trading.
- Money sent by other family members living and working outside the community.
- Money from family members within the community.

7.1 Kyekyewere: cash and non-cash contribution of NTFPs to livelihoods

This section presents the results from the raw tables (Figure 7.1) that were completed at the end of the PROFOR activity in Kyekyewere. The individual numbers and NTFPs that were listed on the sheets during the exercise can be found in Appendix 9.5. The numbers in the tables represent the 20 stones that each of the participants used. Table 7.1 shows the results of the last part of the PROFOR livelihood analysis: the proportion of the entire household's annual income that comes from cash and non-cash sources.

Figure 7.1 PROFOR Livelihood analysis results from Kyekyewere



Based on the above data it is possible to draw some interesting conclusions. Beginning with Tool 4, the livelihoods analysis, it is important to keep in mind my third research sub-question: What is the contribution of NTFPs to people's livelihoods in terms of domestic use and trade? After some initial conclusions have been drawn I will move on to the proportion of the entire household's annual income that comes from cash and non-cash sources. This shows the differences of importance that men and women place on cash and non-cash sources of income for their household.

7.1.1 Female CASH component and male CASH component

It is evident that while both groups earn most income from agricultural products, the male group earns far more from NTFPs than the female group (28% compared to just 5%). Why is there such a large difference? If we look back to the household survey results, many of the respondents claimed that men were the ones who primarily went into the Forest Reserve to collect NTFPs, because it was either too dangerous (risk of being caught without a permit) or because many of the products are simply too large to carry out of the reserve. Looking at the spreadsheet for the female CASH component we see that the only NTFPs that have been listed are herbs, which are easy enough to carry and transport.

It comes as no surprise that both groups earn the most from agricultural products. The people in Kyekyewere first and foremost depend on farming. Because it is a community within a fixed boundary area the people there must rely primarily on what little admitted farmland they have and

secondly on the area surrounding their farmland. In this case, that area is the Forest Reserve. The next closest village (by car) is 45 minutes away, along a very steep and often very muddy road.

7.1.2 Female NON-CASH component and male NON-CASH component

Here what is interesting is that not only did both NTFP figures jump up but they are actually closer together this time (46% and 55%), unlike the CASH component. The annual non-cash component of a household's livelihood was described to the participants as things they benefit from and use daily, but do not receive income from. It is evident here that NTFPs contribute quite a lot to people's livelihoods. From the spreadsheets it is possible to see which NTFPs in particular households used the most often. Almost every participant, from both the female and male groups, rated things like mushrooms, pestles, canes, bushmeat, snails and chewing sticks.

Table 7.1 Proportion of the entire household's annual income that comes from cash and non-cash sources:

FEMALE GROUP: KYEKYEWERE, TANO OFFIN FOREST RESERVE 9 SEPTEMBER 2009			
PARTICIPANTS	CASH	NON-CASH	TOTAL
1	9	11	20
2	5	15	20
3	13	7	20
4	7	13	20
5	5	15	20
6	4	16	20
7	6	14	20
8	8	12	20
9	8	12	20
10	5	15	20
TOTALS	70 (35%)	130 (65%)	200

MALE GROUP: KYEKYEWERE, TANO OFFIN FOREST RESERVE 9 SEPTEMBER 2009			
PARTICIPANTS	CASH	NON-CASH	TOTAL
1	15	5	20
2	13	7	20
3	13	7	20
4	17	3	20
5	12	8	20
6	12	8	20
7	14	6	20
8	17	3	20
9	5	15	20
10	13	7	20
TOTALS	131 (65.5%)	69 (34.5%)	200

7.1.3 Proportion of the entire household's annual income that comes from cash and non-cash sources

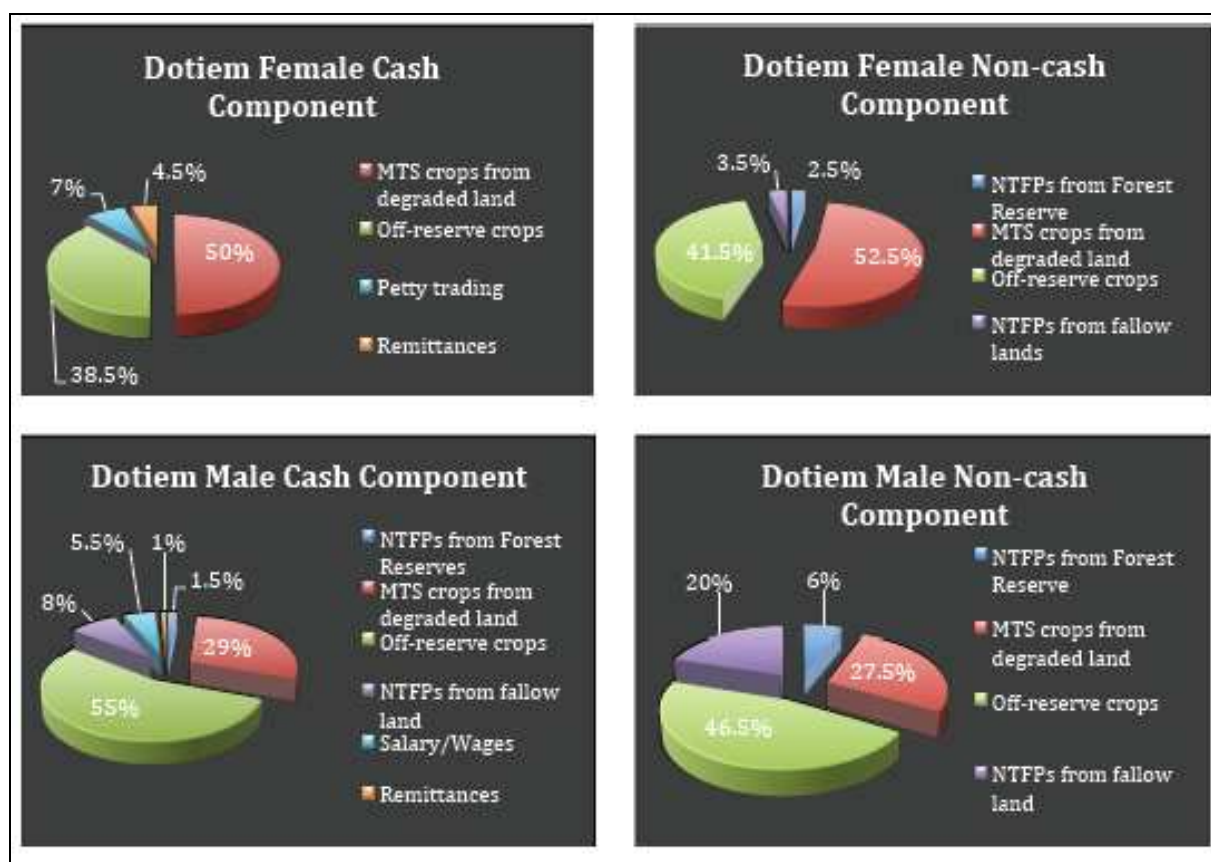
Fortunately I was able to have time to complete this portion of the livelihood analysis. I did not carry out this step in Kunsu Dotiem. The percentages for the female group show that 65% of their income comes from non-cash sources, while only 35% from cash sources. Interestingly, the male group shows almost the exact opposite of this, with 34.5% of their annual income deriving from non-cash sources and 65.5% coming from cash sources. This could mean that men view their household income primarily in monetary form, or that in order to get through the year they must rely on products that they can sell. This also would include things like wages and remittances. Looking at the outcome of the female group, it seems they view their annual income in terms of resources they consume or use at home and which they do not sell.

These numbers in the charts are not absolute, nor do they provide exact figures in terms of amounts and quantities of consumption and use of NTFPs. But what these percentages do provide is a sketch of a rural community in that it is possible to see the various livelihood components for each household.

7.2 Kunsu Dotiem: cash and non-cash contribution of NTFPs to livelihoods

The village of Kunsu Dotiem differs from Kyekeywere in a number of ways. The results from Kunsu Dotiem were very different than those of Kyekeywere. It is worth noting a few contextual distinctions before analyzing the PROFOR livelihood exercise. Firstly, Kunsu Dotiem is located off reserve, meaning that they have access to different types of land use zones (farm lands, fallow lands, the forest reserve). This people in Kyekeywere are far more limited in the types of places they can go to farm or collect NTFPs. Secondly, many of the people in Kunsu Dotiem are farmers who are involved in the Modified Taungya System (MTS). This is a benefit-sharing scheme by which farmers are given degraded portions of forest reserves to cultivate timber trees. During the early years of tree growth the farmers are allowed to plant crops in between the timber trees. They are also allowed to collect NTFPs from these areas. Thus the results from Kunsu Dotiem may not accurately show the degree to which NTFPs are extracted and used at the household level. Since many of the participants were MTS farmers it is no surprise that they derive many of their cash and non-cash benefits from their MTS plots.

Figure 7.2 PROFOR Livelihood analysis results from Kunsu Dotiem



7.2.1 Female and male cash component

None of the women and only 1.5% of the men recorded earning any income from NTFPs from the Forest Reserve, although 8% of the male group stated that they obtain income from NTFPs from fallow lands. Most of the cash income that the people of Kunsu Dotiem generate comes from crops that they manage in their MTS plots or from off-reserve fallow lands.

7.2.2. Female and male non-cash component

Combining NTFPs from the Forest Reserve as well as from fallow land, there is a general increase of the percentage in use of non-timber forest products for daily use. This increase is still small compared to the non-cash benefits derived from crops.

It is difficult to derive any conclusive arguments from the PROFOR results from Kunsu Dotiem. Aside from there being mostly MTS farmers involved with this activity, there are other reasons to suggest that NTFPs may play a bigger role in people's livelihoods in the village of Kunsu Dotiem. The survey results suggest that NTFPs are widely used and consumed within the village. When asked about permits many of the people were hesitant to discuss them, or simply stated that they extract NTFPs from fallow lands in which they do not need a permit. Still, others admitted that they go into the reserve illegally to collect NTFPs. One person even stated that he gets poles and canes from the

Forest Reserve and hides them in cars to take to sell in the local market. Other people indicated that ‘middlemen’ would pick up permits for them so that they could then go and collect certain NTFPs from the Reserve.

7.3 Summary

If we compare the two villages of Kyekyewere and Kunsu Dotiem there are some noticeable differences between the two areas. Even though the people in Kyekyewere consider themselves farmers above all, the results show that they still rely on NTFPs for their livelihoods. In Kyekyewere the results from the activity seem to suggest that the men benefit more from NTFPs as cash sources, while both the male group and female group participants indicated a strong usage of NTFPs as part of their non-cash income in their livelihoods. The female group jumped from 5% of NTFPs in the cash component up to 46% for the non-cash component of their livelihood. The male group also jumped, although not quite as dramatically (28.5% up to 55%).

In Kunsu Dotiem the percentage of which NTFPs play a role in livelihoods is rather small. There are two major reasons for this I believe: Firstly, because Kunsu Dotiem is not located inside the reserve (or inside the GSBA for that matter), the people there have more land options. They are not confined to their admitted farmland and are not completely surrounded by the Forest Reserve. Thus, they make use of the different land zones in order to plant their crops, which, according to the PROFOR results, is what makes up most of their livelihood. Secondly, the village of Kunsu Dotiem has been given the opportunity to take part in the MTS, which offers them the chance to plant even more crops, sometimes even quite far away from their village. As the people of Kunsu Dotiem are farmers as well, they not only have more land surrounding their immediate village site than those in Kyekyewere but they are also able to plant crops on MTS plots that are located in areas nowhere near the village. I do believe the people in Kunsu Dotiem make use of a variety of NTFPs, but because they have many opportunities to plant the crops they want, forest produce from the Reserve is not relied upon nearly as much as in Kyekyewere.

VIII. Conclusions and recommendations

In this chapter I will provide a summary of the research findings and address them with respect to the research questions. After reviewing the research questions I will discuss the relationship between the theoretical framework and the research findings. Then I will give my recommendations for further research followed by policy recommendations. The chapter concludes with my overall reflections on the research experience.

8.1 Summary of the research findings

In order to provide an accurate summary of the research findings it is appropriate to go back and look at the research questions. They will help to guide this final chapter.

1. To what extent do governance arrangements in Ghana's High Forest Zone help or hinder local people's right to access NTFPs for their livelihoods?
2. What policies and governance arrangements (including the rights to access, extract, plant, manage and transport) are in place to support NTFP conservation, utilization and trade?
3. What kinds of animal and plant non-timber forest products are extracted under each of these arrangements?
4. What is the contribution of NTFPs to people's livelihoods in terms of domestic use and trade?

8.1.1 Governance arrangements and people's rights to access NTFPs

I think the permit system is in place to help the people who used NTFPs for their livelihoods in terms of domestic use and trade. It is there to protect and manage the resources of the Forest Reserves from overexploitation. However, based on time spent in the rural communities of Kyekyewere and Kunsu Dotiem, it is evident that this system has its flaws. Survey results show that there is far less patrolling of the Tano Offin Forest Reserve now than 10 – 15 years ago. That alone gives people little incentive to go to the Forest District Office to go through the procedure of obtaining an NTFP permit. That being said, the survey results also show that it is mostly men that go into the Forest Reserve illegally out of fear of being caught, so there is some semblance of policing and monitoring going on in the area.

Much like the case studies in Chapter IV, dwindling resources due to overexploitation and lack of local management is a major problem in both of the research sites I visited. The questions remains, does the NTFP permit system help or hinder local people's right to access NTFPs for their livelihood? There is a short-run answer and a long-run answer to this question. In the short-run it is arguable that the permit system helps people to access NTFPs for their livelihood. This is because the system does not function properly, allowing people to enter and take from the reserves what they need whenever they need it for their daily lives. In the long run however (and to a certain extent now for some NTFPs), the dysfunctional permit system will hinder people's ability to access NTFPs for their livelihoods. Overexploitation and lack of local management will continue to lead to dwindling resources in the form of forest degradation and lost species.

8.1.2 Policies and governance arrangements to support NTFP conservation, utilization and trade

The NTFP permit system is the main policy that regulates NTFP conservation, utilization and trade; and only for the extraction from on reserve areas. The system is supposed to ensure that overexploitation does not take place from the FR. If living inside the Forest reserve then often the communities have an admitted right to collect NTFPs without a permit, as long as it is for domestic use only. In terms of trade and commercial use, one must visit the local forest district office and go through the process of obtaining a permit. There is no formal policy that controls NTFP conservation, utilization and trade in off-reserve areas. There are, however, some community mechanisms in place such as bushfire patrolling as well as observed hunting seasons for certain types of bushmeat.

8.1.3 What kind of NTFPs are used under each of the arrangements?

Plant non-timber forest products that are common in both research sites are in the form of pestles, canes, herbs, spices, chewing sticks and wrapping leaves. Animal-based NTFPs such as grasscutters, snails, antelope and rats are very important to the diets of both communities as well. In terms of domestic use, the PROFOR results show that NTFPs are very important for daily use and consumption, whether as tools, construction materials or food. In terms of trade it seems less so, mainly because the communities relied on crops they planted in their admitted farms (Kyekyewere) or on their MTS plots (Kunsu Dotiem). In the village of Kyekyewere, the women seem to place heavier importance on the non-cash component of their livelihood, which was for their group split almost equally between NTFPs and crops. On the other hand, the men placed more importance on the cash component of their annual livelihood, which showed that 63.5% came from crops while 28% came from NTFPs.

8.1.4 The contribution of NTFPs to people's livelihoods

During the PROFOR exercise I was able to come up with the relative contribution of NTFPs to people's livelihoods. Both villages predominately rely on farming for their cash sources of income. This comes as no surprise as there are few other livelihood options available for them. Other occupations include: teacher, trader, carpenter, chainsaw operator, hairdresser, driver and seamstress to name a few. What is interesting about the PROFOR results, especially so in Kyekyewere, is that of the non-cash component of their livelihoods. The proportion of NTFPs jumped quite a lot compared to the importance they placed on NTFPs as a cash component (See detailed table in Appendix 9.5 and 9.6). In terms of daily use and consumption it is possible to say that NTFPs contribute very much to people's livelihoods. This is confirmed in the survey results, in which respondents placed much emphasis on the fact that many of the NTFPs they use and rely upon have been disappearing from the forests and adjacent lands.

8.2 Discussion – link to theoretical framework

The theoretical framework proved to be a very valuable asset to me during the research process. It helped to guide and refine my research questions and to a certain extent, give me insight into what to expect during my time in Ghana. The NTFP debate falls very much in line with forest-based poverty alleviation. Can people utilize the forest and its products to maintain their livelihood whilst simultaneously improving the quality of the forest itself? With regard to my research I found that people do indeed utilize the forest for NTFPs that they use, consume and trade on a daily basis. On

the other side of the NTFP debate comes conservation, which seems to be more of a challenge for the people and government of Ghana. Appiah *et al* (2009:472) precisely sum up this dilemma:

“Since forests are the sources of many products which the local people depend, complete protection of remaining natural forests, although highly desirable, faces socio-economic constraints, which makes such a goal difficult or impossible to achieve.”

Furthermore looking back at Sunderlin *et al* (2005) conclusions about the future potential of FBPA (refer to table 2.1) and apply them to my two research sites it then becomes possible to draw some conclusions linking theory to practice.

1. *Conversion of forest to agriculture*: This is happening in both villages I visited. In Kyekyewere, the people have admitted farmland located inside the GSBA. In Kunsu Dotiem, the people make use of various land use zones for agricultural purposes, such as fallow lands and MTS plots.

2. *Timber*: Only in Kunsu Dotiem will some of the community members benefit from timber. This will come as a small percentage from their MTS plots, however income will only come once the timber trees have matured. The means that people will have to wait years to see any sort of return.

3. *NTFPs*: Sunderlin *et al* (2005) conclude that NTFPs can be used domestically and also produced for the sale into different marketing systems, however a lot of evidence shows that once marketable, NTFP extraction often leads to overexploitation.

In Kyekyewere and Kunsu Dotiem, it seems that while NTFPs are used for domestic purposes, they are not traded commercially to a high degree.

4. *Environmental services*: Of the environmental services listed only biodiversity conservation is relevant for the study site at Kyekyewere, which is located inside the GSBA. The GSBA does not however benefit the people, only the forest itself.

The reality is that it seems very difficult to meet the needs of forest conservation while at the same time meet the needs of forest adjacent communities. The GSBA is good for forest conservation but because of its highly restrictive status it limits the livelihood options for the people in Kyekyewere. On the other hand the forest provides many important opportunities for the people living in or near them. People can convert them for agricultural purposes but that leads to forest loss. People also extract forest produce but often risk doing so at unsustainable rates.

What then, is the way forward in trying to achieve the balance between sustainable NTFP extraction and forest conservation in Ghana's Forest Reserves? The answer to that question can be answered by looking at the third section of my theoretical framework, environmental governance. As mentioned, governance is complex in that it involves a host of actors, all with competing claims on the environment. For instance, the government of Ghana may place forest conservation higher on its agenda while a community-based local organization may focus more on the livelihoods of those living nearby forests. Such is the case with the NTFP permit system. In order for it to function properly, whereby allowing people into the forests to extract NTFPs at a sustainable rate, many different actors must work together. At the moment this does not seem to be happening. While the permit system is in place, many simply choose not to go through the cumbersome process of

obtaining one. Many take the chance and enter the forest reserve illegally because they know there is a slim chance of being approached by a Forest Officer. If the Forest Services Division is short-staffed then it should be taken up with the Minister of Lands and Natural Resources. At all levels this requires a high degree of organization in order to keep up with just one forest policy, one example being the NTFP permit system.

Another major part of my research involved looking at the contribution of NTFPs to people's livelihoods. Thus the section in my theoretical framework on livelihoods and development proved extremely relevant. It became very clear to me that the communities I visited use NTFPs in the daily lives, for both domestic use and to a lesser extent to trade. Just as a livelihood is made up of various parts, the participants in the PROFOR activities revealed the various components of their livelihoods. They derive benefit in the form of cash wages and remittances, as well as direct income from the crops they produce on their farms. They also benefit from farm animals such as poultry and goats. Yet their livelihood is not just based on direct cash income. They also indicated day-to-day benefits that they derive from the forest and their farms. Things such as palms and poles prove to be invaluable because they are utilized in the construction of their homes. The rural communities make use of NTFPs like pestles and mortars in order to prepare the staple food dishes. Herbs and spices collected from the forest are used in the dishes to add flavor to the *fufu*. Whether for food, construction or household goods, it is clear that the forests and its resources contribute quite a lot to the livelihoods of the communities I visited.

8.3 Recommendations for further research

8.3.1 Follow up research

Due to constraints of time and access, I was only able to visit the Nkawie Forest Division office on two occasions. The first time was to ask permission to enter to Tano Offin area and to inform the head Forest Services Officer of my research intentions. The second time I made the excursion outside of the city to interview the Forest Officer he was out of the office. This was frustrating because my local supervisors and I had planned to meet with him and discuss certain issues relating to my preliminary research findings. Consequently, the majority of my research findings are from the perspective of the people from the rural communities that I visited. An interesting follow-up study would be to focus solely on the permit system, possibly visiting several FSD offices and interviewing the officers about some questions that have come up during my research. Firstly, what is the perception of the FSD staff about the effectiveness of the permit system regarding NTFP extraction in the Forest Reserves? On what basis are permit prices set? Does the process of obtaining a permit differ from district to district?

The regulation of NTFP extraction is managed through the permit system, however it is only applicable to resources taken out of Forest Reserves. There is no official resource management system for areas outside of reserves, where many NTFPs are gathered. The only local forms of natural resource management that I came across during my interviews and surveys were bushfire patrolling during the dry season and the observed hunting ban during animal mating season. Yet nearly every person surveyed stated that they experienced dwindling NTFP resources, such as bushmeat, pestles, canes, poles, mushrooms, etc. It would be worth looking into various community-based natural resource management schemes that focused on educating and creating awareness about things like NTFP inventory and re-growth patterns. For instance, because the tree used for making pestles does not coppice, people could be taught how to plant the tree and harvest it at a

sustainable rate. Over half of the people from the household surveys indicated that they would like to learn how to plant certain NTFPs. They stated that they had not done so because of lack of scientific knowledge on the subject as well as lack of funds to initiate such a task.

8.3.2 Feasibility study on alternative livelihood strategies: grasscutter rearing and snail farming

On top of wanting to learn how to plant certain NTFPs, the overwhelming majority of people indicated that they would be very interested in grasscutter rearing and snail farming. These are two very important components of the rural community's diets but they are also becoming increasingly scarce. Grasscutter rearing and snail farming are examples of alternative livelihood strategies, which have been introduced into certain rural communities in Ghana. According to Tropenbos-Ghana, alternative livelihood strategies are intended to help economically disadvantaged members of societies to meet their daily subsistence needs in a manner that is



Figure 8.1: Adult Grasscutter (Pesseat 2003).

dignified, locally appropriate, and environmentally sustainable (Inkoom *et al.* 2005). Other examples of alternative livelihood strategies are soap making, bead making, bee keeping, pottery, aquaculture, poultry farming and cloth making and weaving. In this section however, I will only focus on grasscutter rearing and snail farming because that is what the communities of Kyekyewere and Kunsu Dotiem seem most interested in doing. Thus a feasibility study on grasscutter rearing and snail farming would be relevant for both Kyekyewere and Kunsu Dotiem.

Grasscutter rearing

Grasscutters are often sold along the roadside in Ghana and can be found in many restaurants throughout the country. It is popular amongst both rural and urban communities and it has gained popularity of late to the extent that it is even considered a delicacy (Sarkodie and Agyapomaa 2005).



Figure 8.2: Example of indoor grasscutter housing. (Insaadoo 2009).

Unfortunately, there is a decline in wild grasscutter population, which is one of the reasons why there is such a high price for its meat. According to Sarkodie and Agyapomaa (2005), there has been a recent push by NGOs and the Ministry of Food and Agriculture (MoFA) into the promoting of grasscutter rearing. Grasscutter rearing not only can meet subsistence needs for a community but can also generate supplementary income for farmers as well. It is difficult however, for a farmer to get started with such an alternative livelihood strategy. The cost of training, housing, feed and equipment is often too much for a farmer. On top

of that I discovered during an interview that the grasscutters have very sharp teeth and can bite very hard. I was told that because of this many, especially women, do not wish to participate in grasscutter rearing.

Snail farming

Snail meat is also very important in the diets of rural communities. It can also be undertaken as an alternative livelihood strategy if done commercially. Because the communities I visited stated that there were fewer snails every year, I recommend looking into the possibility of introducing snail farming as a practice in Kyekyewere and Kunsu Dotiem. The following are some of the benefits that can be derived from snail farming:



Figure 8.3: Typical Snail found in Ghana's HFZ

Table 8.1 Benefits of Snail Farming (Sawyerr and Opoku 1992):

1. Snails can be made available throughout the year and not only during the rainy season.
2. Snail farming is a way of conserving the fast-decreasing snail populations in the wild. The snails are being destroyed by bush fires and the indiscriminate use of pesticides.
3. In captivity snails can be made to attain marketable size within a shorter period than in nature, especially by feeding them with highly nutritious compound feed. They also multiply faster because their predators and enemies are controlled.
4. Snail farming can be taken on as a hobby in the spare time, bringing in extra income especially during the dry season when prices soar up to 5-6 times. There is also a vast export market for snails in Europe and America.
5. Snail meat contains roughly 60% dry weight good quality protein and appreciable quantities of potassium and phosphorous. It is a good source of vitamin B complex and vitamin C.
6. Snails can be used as food for livestock. Chickens and ducks fed ground and boiled snails showed marked increase in the number and size of eggs and the weight of chickens.
7. Snails have been used in medicine over the years in the treatment of stomach ulcers, hypertension, anemia, hemorrhoids and to restore virility and vitality in men.

Challenges

While I do suggest that further research be done testing the feasibility of such alternative livelihood strategies for the communities of Kyekyewere and Kunsu Dotiem, there are of course some practical challenges that must be taken into consideration. Firstly, there are probably many other small rural communities that would like support from either NGOs or MoFA in order to partake in strategies such as grasscutter rearing and snail farming. What then, are the criteria for choosing such a community? Once a particular community has been chosen, who in that community will be the one to get the opportunity to become a snail farmer? How is that person chosen? These are issues that have the potential to disrupt a community from within, particularly causing jealousy. I had the opportunity to visit a community that my local supervisor had been working in and I interviewed a man there about alternative livelihood strategies. The man told me that someone from his village had been chosen to raise pigs up in the hills. After a year or so, his pig-farming endeavor turned out to be quite a lucrative business. One day however, the farmer went to his pigs only to find all of them dead.

Later, he found out that someone from the neighboring village had poisoned all the pigs. Apparently, at one point in time, that other village was going to be chosen to receive help from an NGO to start pig farming but it fell through and never happened. Resentment set in and someone acted on it, poisoning every single pig. These are just some of the practical issues that I can foresee occurring when introducing an alternative livelihood strategy into a particular community.

8.4 Recommendations for policymakers

The overall project that this thesis intends to be a part of is ‘aimed at generating insight into and formulating recommendations on governance arrangements that enhance forest-related livelihoods so that they contribute to sustainable forest managements and poverty alleviation’. For my contribution I have looked specifically at NTFPs, how they are regulated and how they contribute to rural community’s livelihoods. This final section is split into two parts. The first part covers the current permit system regarding NTFP extraction. The second part gives the results of the PROFOR tool of the Problem and Solution Matrix from Kyekyewere. I have included it here because it does not specifically fit into my research as such, however this turned out to be possibly the most important part of the participatory group work activity in that it triggered a lot of conversation amongst the community members. Most of their problems and solutions cannot be met by the community alone. That is why I have included it here in the ‘Recommendations for policymakers’ section.

8.4.1 Review of the permit system

Based on the data I have gathered, especially from the interviews and surveys with community members as well as unpublished reports from the Forest Services Division in Kumasi, it is clear to me that the permit system is ineffective as a means of regulating NTFP extraction from the Forest Reserves. People continue to extract NTFPs for their livelihoods, but often do so without permission. Furthermore, just as in the rattan, chewing stick and bushmeat case studies, there seems to be an ever-increasing rate of natural resource depletion amongst the two communities I studied. The surveys indicated that NTFPs such as pestles, canes, palms, mushrooms, snails, antelope, porcupine and grasscutter were becoming harder to find in the forests and surrounding areas. Thus I suggest the following outline of recommendations for policy makers:

- A thorough review of the current permit system. More research is needed on its effectiveness amongst forest-based communities.
- Increase staffing of FSD and increase patrolling of Forest Reserves. Many people stated that Forest Officers rarely came by to check and enforce the permit system.
- Examine the potential for a registration system for certain NTFPs (such as the leaf gatherers of Kwapanin). A registration system means that people have to go through the process of getting permission to extract NTFPs far less often than they do now for the permit system.
- Promotion of community-based natural resource management (CBNRM) for non-timber forest products. The permit system is only relevant for the Forest Reserves. However much of the NTFP collection that occurs with the rural communities takes place off reserve and in fallow lands. This

means that a person can take what they want when they please. It would be interesting to see how receptive communities would be to CBNRM initiatives.

8.4.2 Follow up on problems signaled by community members from Kyekyewere

The purpose of the PROFOR forest problem and solution matrix is to identify and rank the main forest problems, and suggest potential solutions (PROFOR 2008). After the livelihoods analysis we sat down casually with the participants and invited more members of the community to come and participate in the conversation. This resulted in the identification of problems and potential solutions as summarized in Table 8.2.

Table 8.2 Actions suggested by community members from Kyekyewere

PROBLEM	SOLUTION	LEVEL
1. Not enough land – the allocated farmlands are not large enough for the population.	Creation of other job opportunities within the community	Central government, Ministry of Lands and Natural Resources
	Faster growing crops should be incorporated into the farms to increase the profit generated	Forest Services Division, FSD: Educate on which crops best to grow.
	Could there be a land lease for the community, possibly lease part of Forest Reserve. Or,	Possible MTS scheme introduced by FSD
2. Overpopulation makes it difficult to share family lands	Total relocation of the community	Ministry of Lands and Natural Resources
3. Financial problems	Villagers want to be trained how to raise or cultivate snails or mushrooms	FSD, central government, NGOs: Alternative Livelihood Strategies.
4. Poor roads – transport systems makes it difficult to market farm produce and NTFPs.	Create a better road system to the village, then it would be easier to transport crops and NTFPs into and out of the village for sale at local markets.	Central government
5. Lack of techniques to enable maximum utilization of land	Wished to be trained on how to raise of cultivate snails and mushrooms, and plant certain NTFPs	FSD, specifically Forestry Officers

What is interesting about this matrix is that the community members from Kyekyewere felt that none of the major problems they are facing can be dealt with by the community themselves. That is why I have included this matrix in the ‘recommendation for policymakers’ section. For every solution help comes at the level of central government, Ministry of Lands and Natural Resources or Forestry Services Division. During an interview with the chief of Kyekyewere, he stated that they felt trapped because of being located in the middle of the Globally Significant Biodiversity Area. I thought the most interesting outcome of this exercise is that the community would be willing to totally relocate to fallow land, in order to accommodate the needs its the ever-growing population of farmers.

In summary, this exercise leads to the following recommendations:

- Forest and Crop management training for the community
- Funds allocated to the village to be put towards building a better road system leading to the village
- Feasibility study on possible relocation of entire village to fallow land located off reserve
- Introduction of alternative livelihood strategies such as snail farming, planting pestles and grasscutter rearing.

8.5 Reflection

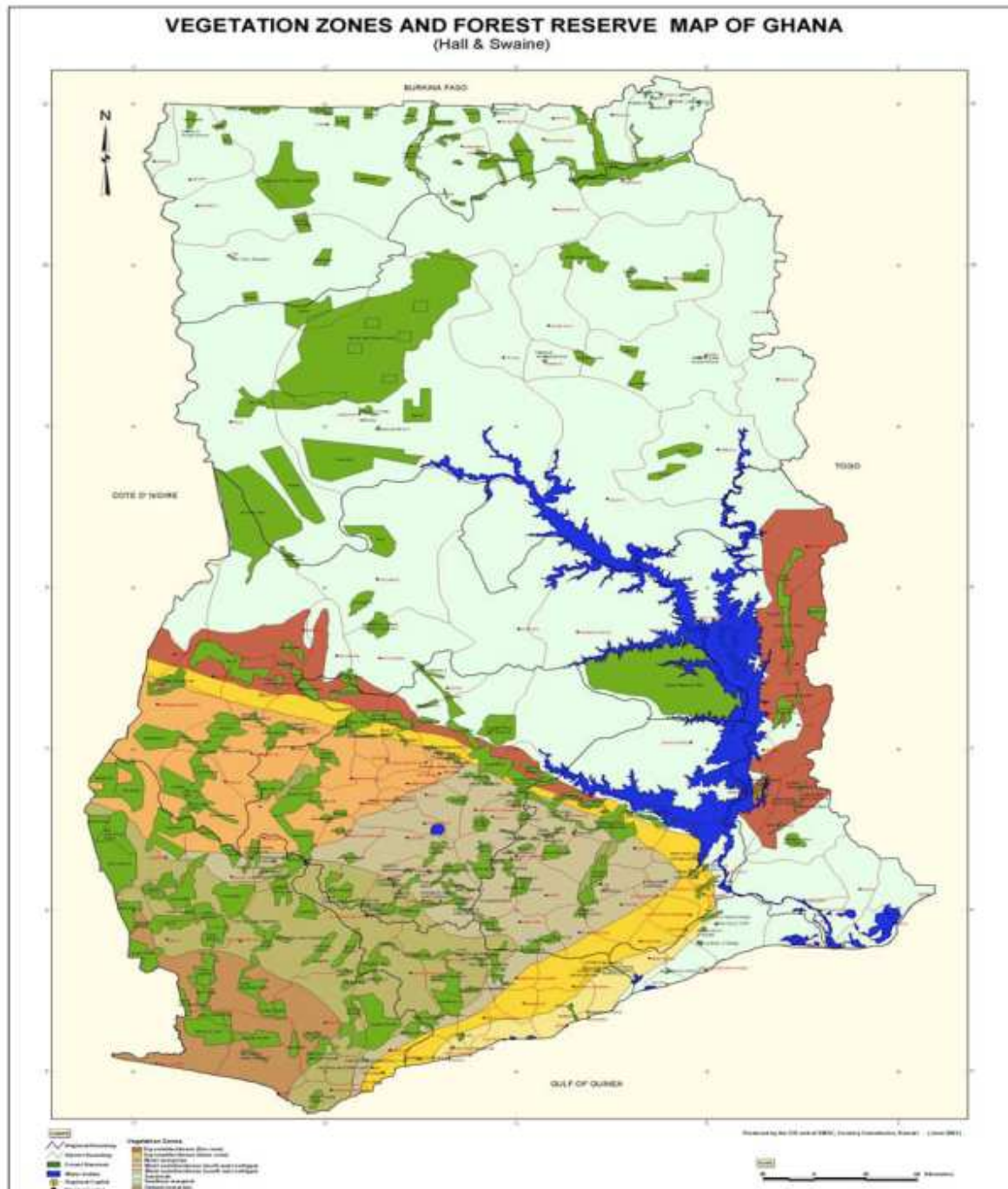
My experience in Ghana as a first-time researcher was truly amazing. This mostly is because of the remarkable people that I have met along the way. Less than a year ago I had no knowledge of the complex relationships that exist between forests and people. In that time I have come to learn quite a lot.

Overall, I am happy with the way the research process was carried out, although I certainly would have liked to have more time in each of the communities I visited. I would also have liked to speak with more people on the other side of the story, such as the local forest officers and forest district managers. In the end however, the research is slightly more one sided, in that it takes mainly the perspective of the villager.

One issue I find rather troublesome is that of natural resource depletion. The case studies in my literature review provided insight into what I could possibly expect upon arriving in Ghana. The household surveys confirmed what I feared, which is dwindling natural resource base and loss of species, both plant and animal.

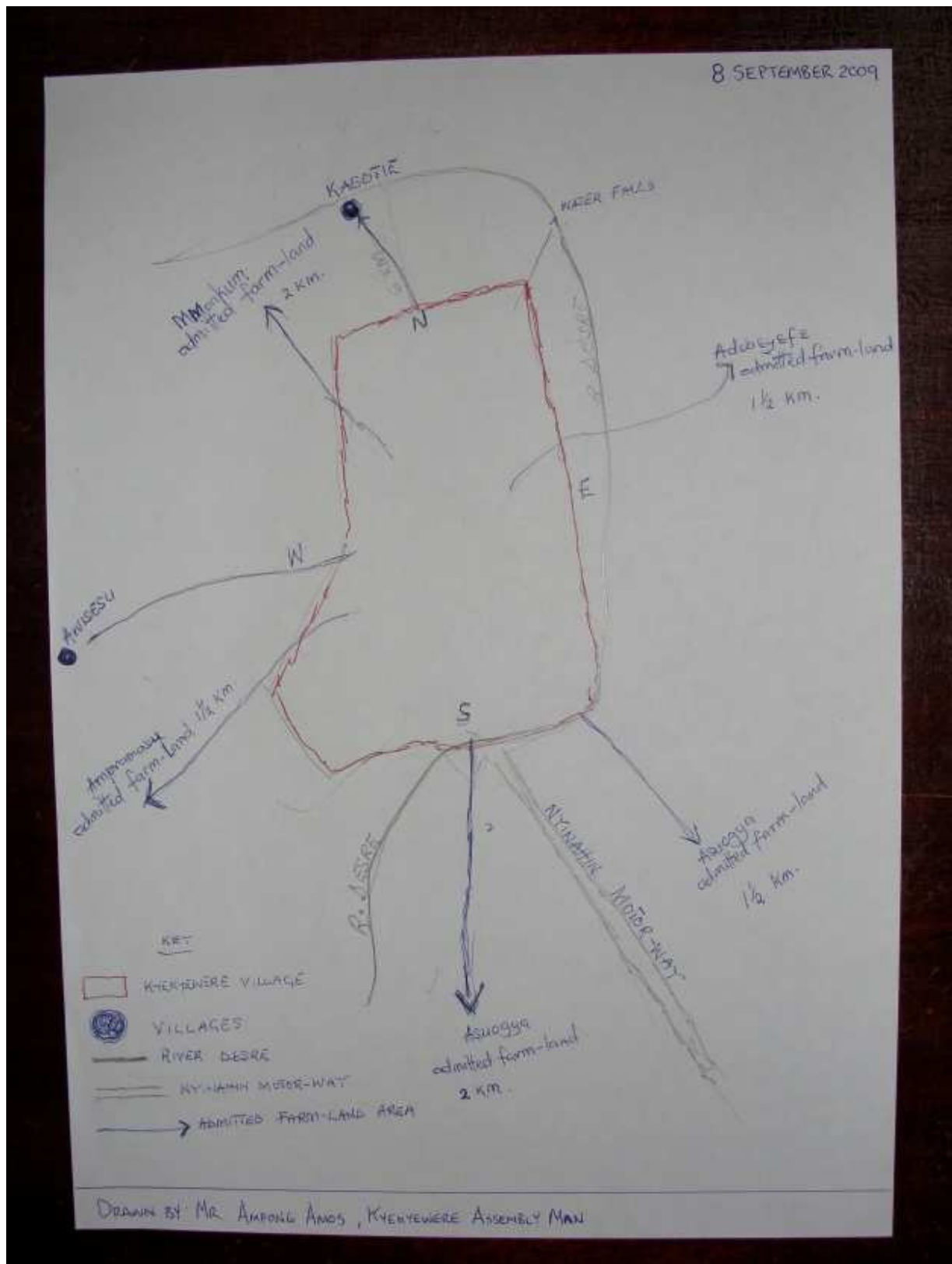
It is good that this thesis is part of an overall project that focuses on generating forest governance policy recommendations. Innovation and collaboration amongst all actors is key to solving some of the major forest issues in Ghana today. The introduction of alternative livelihood strategies is an option but not without challenges. A total revaluation of how NTFPs are regulated and extracted is also necessary I believe.

Appendix 9.1: Vegetation zones and Forest Reserves of Ghana

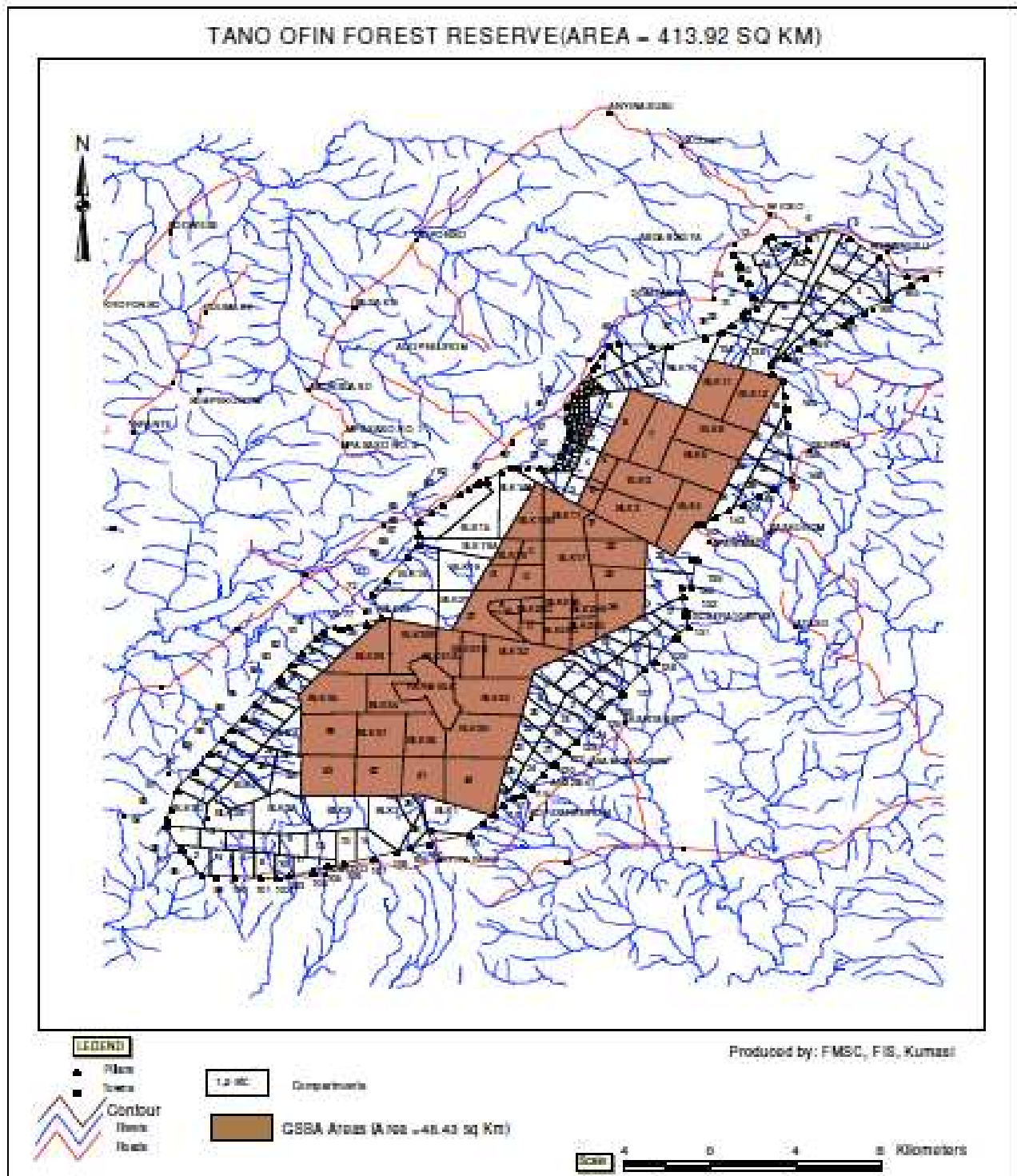


(Boakye and Baffoe 2006)

Appendix 9.2: Hand sketched map of Kyekyewere (drawn by village assemblyman, Mr. Amos)



Appendix 9.3: Map of Tano-Offin Forest Reserve and the Globally Significant Biodiversity Area



(Kyereh 2007)

Appendix 9.4: Example of Household survey administered in both rural communities



Understanding NTFPs and rural livelihoods in Ghana's High Forest Zone
University of Amsterdam, Kwame Nkrumah University of Science & Technology
and Tropenbos International Ghana



Interview No.		Village:	
Interviewer:		Region:	
Date:		Admin. District:	
Time:		Forest District:	

Introduction: [to be read to respondent]

We are students carrying out research on forest-related livelihoods in Ghana. We are supported by Tropenbos International Ghana, Kwame Nkrumah University of Science & Technology (KNUST) and the University of Amsterdam. This study is trying to determine how governance arrangements (rights to access, extract, plant, manage and transport) help or hinder people's use of non-timber forest products for their livelihoods.

We would like to ask you some questions related to forests, in particular, non-timber forest products, how they are accessed, and where they are accessed from (on-reserve, off-reserve, fallow lands, private farms, etc.). Your answers will be treated anonymously, meaning that nobody can see the responses you have made.

You are very welcome to ask any questions during and after the interview.

Section A: BIODATA

{Please fill in and tick choices}						
1. Gender	Male:		Female:		2. Age:	
3. Educational Level	Primary:	JHS:	SHS:	Informal Education:	None:	Other (please specify):
4. Origin:	Native/Indigene:			Migrant:		
	5. If migrant, hometown?		District:	Region:	No. of years in this village:	
6. Marital Status:	Married:	Single:	Divorced:	Widowed:	Separated:	
7. Household type:	Nucleus:		Extended:	Household size:		
8. Occupation:						

Section B: FOREST RELATED LIVELIHOODS IN TANO OFFIN RESERVE

1. Forest livelihood you are involved with: <i>can tick more than one</i>	(a) MTS (Only relevant at Dotiem):	(b) Collection of NTFPs for domestic use:	(c) Collection of NTFPs for commercial use:	(d) Forest reserve boundary maintenance:	
	(e) Chainsaw lumbering:	(f) Formal employment (specify):	(g) Remittances:	(h) None:	(i) Other (specify)

[Note: MTS = modified taungya system (farmers are given degraded portions of forest reserves to farm and cultivate timber trees. The farmers have 40% of tree output as benefits; FC = 40%; Landowners = 15%; forest fringe community = 5%]

Section C: GOVERNANCE ARRANGEMENTS CONCERNING NON-TIMBER FOREST PRODUCTS FOR DOMESTIC USE

<p>1. Please list which types of plant and animal NTFPs are extracted and used within this household:</p> <p><i>* If possible, please specify local name AND common name</i></p>	<p align="center">Plant-based products*</p> <ul style="list-style-type: none"> • • • • • • • • • 				<p align="center">Animal-based products*</p> <ul style="list-style-type: none"> • • • • • • • • • 				
<p>2. Seasonal variations:</p>	<p>Which NTFPs from the above list are extracted all year?</p>				<p>Which NTFPs are extracted only part of the year? (specify season)</p>				
<p>3. Where are the NTFPs extracted from? tick all that apply</p>	<p>On-reserve:</p>	<p>Off-reserve:</p>	<p>Fallow land:</p>	<p>Farm lands:</p>	<p>Other areas: (specify)</p>				
<p>4. What methods are used to extract the NTFPs?</p> <p><i>[Please specify which NTFP type, the technique used to extract it and whether it's an indigene or modern method]</i></p>	<p>NTFP type:</p> <ul style="list-style-type: none"> • • • • • • 		<p>Technique:</p>		<p>Indigene or Modern method</p>				
<p>5. Any community monitoring mechanisms in place for NTFP extraction?</p>	<p>Yes:</p>	<p>6. If yes, which:</p>	<p>Harvesting calendar:</p>	<p>Seasonal hunting ban:</p>	<p>NTFP inventory system:</p>	<p>Other (specify):</p>			
<p>7. Who in this household has the right to access NTFPs?</p>	<p>Everyone in this household?</p>		<p>Yes:</p>	<p>If not everyone, who does and who does not?</p>					
<p>8. Are any permits required to extract any of the NTFPs for domestic use?</p> <p><i>* Please specify how often they have to obtain the permit [on what basis: weekly/monthly/yearly, or each time]</i></p>	<p>If so, please specify which ones:</p> <ul style="list-style-type: none"> • • • • • • 			<p>Cost of permit, if any?</p>		<p>* How often?</p>			

Section D: GOVERNANCE ARRANGEMENTS AND NON-TIMBER FOREST PRODUCTS FOR COMMERCIAL USE

<p>1. Please list which types of plant and animal NTFPs this household trades commercially:</p> <p><i>* If possible, please specify local name AND common name</i></p>	<p align="center">Plant-based products*</p> <ul style="list-style-type: none"> • • • • • • • • 		<p align="center">Animal-based products*</p> <ul style="list-style-type: none"> • • • • • • • • 	
<p>2. How are the NTFPs measured?</p>	<p>Per bundle (which):</p>	<p>Per head load (which):</p>	<p>Per basket (which):</p>	<p>Other units (please specify how and which NTFPs):</p>
<p>3. Where are the above NTFPs traded, or sold to?</p>	<p>Local market (name):</p>	<p>Regional market (name):</p>	<p>Middleman:</p>	<p>Other (please specify):</p>
<p>4. Seasonal variations:</p>	<p>Do you sell these products throughout the entire year?</p>	<p>Yes:</p> <p>No:</p>	<p>If not, please specify which NTFPs and during which season they are not sold:</p>	
<p>5. Are there any marketing arrangements set up for any of the NTFPs mentioned above?</p>	<p>If so, specify which products and briefly explain how they are marketed:</p>			
<p>6. Are permits required to trade any of the NTFPs?</p> <p><i>* Please specify how often they have to obtain the permit [on what basis: weekly/monthly/yearly, or each time]</i></p>	<p>If so, please specify which ones:</p> <ul style="list-style-type: none"> • • • • • • 		<p>Cost of permit, if any:</p>	<p>* How often?</p>
<p>7. Do you pick the permit up yourself?</p>	<p>Yes:</p> <p>No:</p>	<p>8. If so, from where and how far is it from here?</p>		<p>9. If not, who obtains the permit for you? (e.g. middleman, family member)</p>

<p>10. Is there a registration system in place for extraction of NTFPs?</p> <p><i>* Please specify how often they have to obtain the permit [on what basis: weekly/monthly/yearly, or each time]</i></p>	<p>If yes, which must you register for?</p> <ul style="list-style-type: none"> • • • • • • 	<p>Cost of registration?</p>	<p>* How often?</p>
<p>[NOTE: only relevant if different than the permit system]</p>			
<p>11. Are there any NTFPs that are no longer available to you? If so, why?</p>	<p>Extinction of species: <i>(specify which)</i></p> <ul style="list-style-type: none"> • • • • • • 	<p>Illegal to extract: <i>(specify which)</i></p> <ul style="list-style-type: none"> • • • • • • 	<p>Other reason: <i>(specify the reason why and which NTFPs)</i></p>
<p>12. Are there any restrictions in place to plant certain NTFP species? If so...</p>	<p>Which species?</p> <ul style="list-style-type: none"> • • • • • • • 	<p>Reason:</p>	
<p>13. If possible, would you like to be able to plant certain NTFPs? If so, which species and why?</p>	<p>Which species?</p> <ul style="list-style-type: none"> • • • • • • • 	<p>Reason:</p>	

Notes: *(please take down any questions or extra comments the respondents may have)*

Appendix 9.5 Detailed PROFOR raw table results from Kyekyewere

Tool 4: Livelihood Analysis Step 2: FEMALE Group CASH components of household's annual livelihood												
	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
FOREST PRODUCTS												
Pestles												
Snails												
Mushrooms												
Herbs				3			2	3				
Cane											10	5%
Chewing sticks												
Incense												
Bushmeat				2								
Firewood												
AGRIC PRODUCTS												
Cocoyam		7	13	6	3		3	15	7	11		
Plantain	10	13	5	3	12	10	3		8	9		
Yam									3		160	80%
Cassava	10		2	1					2			
Vegetables							2	2				
Maize												
FARM ANIMALS												
Goats/sheep							7				10	5%
Poultry							3					
WAGES/ REMITTANCES												
				10		10					20	10%
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

Tool 4: Livelihood Analysis Step 2: FEMALE Group NON-CASH components of household's annual livelihood												
	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
FOREST PRODUCTS												
Pestles	1		1	1	1	1	1	1	1	1		
Snails			1	3	2	1			1	1		
Mushrooms	2	2	1	2	2	1			1	1	2	
Herbs	1		1	1	1	1			1			
Cane			1									
Chewing sticks	2		1		1	1	1	1	1	2	92	46%
Incense						1		1	1			
Bushmeat		3	2		2	2		1	1	2		
Firewood	2	4	2	1	2	1	3	1	1	1		
Poles	1	1	1	1		1	2	1	1			
Wrapping leaves					1							
AGRIC PRODUCTS												
Cocoyams	2	3	2	3	1	2	3	2	2	3		
Plantain	3	3	1	3	3	2	2	1	3	2		
Yam			1			1		1	1	1	93	46.5%
Cassava	2	2	1	3	2	1	3	1	1	1		
Vegetables/fruits	1	2	1	2	1	2	3	2	1	3		
Maize			1			1		1	1	2		
FARM ANIMALS												
Goats/sheep	3		1				1	2	2		15	7.5%
Poultry			1		1	1	1	1	1			
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

Tool 4: Livelihood Analysis Step 2: MALE Group CASH components of household's annual livelihood												
	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
FOREST PRODUCTS												
Mushrooms		2	1	1	2	1		2		1		
Pestles		1	1	1	2							
Bushmeat	2	1	2	2	4	1		4				
Snails		1					1					
Canes				1				1				
Wrapping leaves					1	1		2				
Black Pepper	2			3	1			2				
Chewing Sticks	2	1	1		2							
Incense	2			2								
AGRIC PRODUCTS												
Plantain	4	5	3		2	5	5	4		6		
Cassava	2	1	2		2	5	3		5	2		
Vegetables/Fruits	1		2	2								
Cocoyam	3	6	2		2	5	5	3	12	5		
Bushmeat		1	2	3						3		
Maize	2	1		1	2		3	2	3			
FARM ANIMALS												
Goats/sheep				2		2	3					
Poultry											7	3.5%
WAGES/ REMITTANCES												
		4	2							3	9	4.5%
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

Tool 4: Livelihood Analysis Step 2: MALE Group NON-CASH components of household's annual livelihood												
	Group Participants										Totals	%
	1	2	3	4	5	6	7	8	9	10		
FOREST PRODUCTS												
Mushrooms		1	2	2	2	1		1	4	2		
Snails		1		2	2	3	2	1	2	2		
Bushmeat	2	4	3	3		3	2	4	3			
Pestles		1	2	2	2			1	3			
Canes		1		2	2			1	3			
Water	2	2	3	2			2	3	1	2		
Wrapping leaves									4			
Ropes	2					3				2		
Palm				2								
Black Pepper	2											
Herby spices		1	1				1			1		
AGRIC PRODUCTS												
Fruits	3		2	2	1	4	3			2		
Palm	2	1		2	2	3	2	1				
Plantain	3	3	2	1	3		3	3		5		
Cocoyam	1	4	2		3		3	4		2		
Bushmeat	3	1	3		2	2		1				
Herby/spices					1	1						
FARM ANIMALS												
Goats/sheep							2				4	2%
Poultry										2		
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%

Appendix 9.6 Detailed PROFOR raw table results from Kunsu Dotiem

Tool 4: Livelihood Analysis Step 2: FEMALE Group CASH components of household's annual livelihood													
	Group Participants										Totals	%	
	1	2	3	4	5	6	7	8	9	10			
NTFs from Forest Reserves													
											0	0%	
MT's crops from degraded land													
Plantain	2		9		3		2	5	4	5			
Cocoyam	3		5		2		2	4	5	3			
Vegetables	6		4		3		2	2	3	2			
Fruits	3		2		1			2	3	1	100	50%	
Yam										2			
Sugar cane							2		3	1			
Maize							2		2				
Off-reserve crops													
Maize				8	2	3	1	3		3			
Cocoa		5				2		1					
Vegetables		2				2	2						
Fruits		3			2		2	2					
Yams						6					77	38.5%	
Pear		2					1	1					
Sugar cane								1					
Plantain		4			2		2						
Cassava		4					1			3			
Cocoyam				6	1								
NTFs from fallow lands (off-reserve)													
											0	0%	
Petty trading													
	4			3	4	3					14	7%	
Remittances													
	2			3		4					9	4.5%	
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%	

Tool 4: Livelihood Analysis Step 2: FEMALE Group NON-CASH components of household's annual livelihood													
	Group Participants												
	1	2	3	4	5	6	7	8	9	10	Totals	%	
NTFs from Forest Reserve													
Pestles	1												
Mushrooms	1										5	2.5%	
Snails	1												
Firewood	2												
MTS crops from degraded land													
Cocoa	1												
Plantain	3	3	5	4	3	4				4			
Cocoyams		2	2	5	4	2		7		3			
Vegetables	2	1	2	2	2	3		6		2			
Fruits		1		2		1		2		2	105	52.5%	
Sugar cane	1	1		3						1			
Yam			1	1		2		4		1			
Firewood			2	1	1	1		1					
Maize	2			2									
Off-reserve crops													
Firewood							2		1				
Cocoyam		2					3			1			
Oil Palm					2		1	3		1			
Vegetables							2		1				
Fruits			1			1	1			1	83	41.5%	
Yam						1	2		2				
Sugar cane								1					
Plantain		4	2		4	3	4	2	2	2			
Maize			2		2	1	2	6	1	1			
Cassava	5	1	1		2		3	4	1				
NTFs from fallow lands (off-reserve)													
Firewood		1				1							
Wild fruits		1									7	3.5%	
Pestles		1											
Wild vegetables		2											
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%	

Tool 4: Livelihood Analysis Step 2: MALE Group CASH components of household's annual livelihood													
	Group Participants										Totals	%	
	1	2	3	4	5	6	7	8	9	10			
NITPs from Forest Reserves													
Bushmeat			1								3	1.5%	
Charcoal			2										
MTS crops from degraded land													
Maize	2	1	1				2	2	2	3			
Fruits	1	1						2	2	1			
Cocoyams	1	1	1				2	3	1	3	58	29%	
Plantain	2	2	1					3	3	4	3		
Yam	1				1			1					
Vegetables	1	1					1	2	1	1			
NITPs from fallow land (off-reserve)													
Pestles		1			1								
Vegetables/Cassava	1	2			1	1			1	1	2	16	8%
Bushmeat			2		1								
Firewood		2											
Off-reserve Crops													
Cocoa	2	2	3	5	3	3		5	1				
Palm	1	2	1			3	8	2		2			
Cola	1												
Plantain	2	1	1	2	1	3		2	2	1			
Cocoyam	2	1		1	2	1		2	1	1			
Maize	1	1	1	1	2	2	3		2	2	110	55%	
Cassava	1		3	1	2	1		1	1	1			
Vegetables	1	1	3	1			1	2		1	1		
Bushmeat				1									
Yam				2	1								
Oranges					2								
Salary/M/ages													
		1		3		4			2	1	11	5.5%	
Remittances													
					2						2	1%	
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100 %	

Tool 4: Livelihood Analysis Step 2: MALE Group NON-CASH components of household's annual livelihood													
	Group Participants										Totals	%	
	1	2	3	4	5	6	7	8	9	10			
NTPs from Forest Reserve													
Canes			1			3					12 6%		
Ropes		1											
Snails			1										
Poles (construction)		1											
Peasles		1					1		1	1			
Chewing Sticks							1						
MTS crops from degraded land													
Plantain	2	1	1				1	2	2	3	55 27.5%		
Cocoyams	2	1	1				1	2	1	3			
Fruits	1	1						1	1				
Vegetables	1	1					1	1	1	1			
Snail			1										
Sugar cane	1								1				
Crabs	1	1	1										
Mushrooms	1						1						
Maize	2	1	1				1		1	3			
Bushmeat			2				1		2				
NTPs from fallow land (off-reserve)													
Vegetables		1								1			
Palm	1	1	1	2					2				
Firewood			1					1	1				
Plantain	1	1					1	1		2	40 20%		
Cassava	1		1	2			1	1		1			
Fruits		1				1	1						
Cocoyams	1	1		2				1		2			
Bushmeat			1	2			1						
Mushrooms							1						
Off-reserve crops													
Palm	1	1	1		2	9	1	1					
Cassava	1	1	1	2	2	1	1	1	1	1			
Plantain	1	1	1	2	2	1	1	2	1	1			
Cocoyam	1	1		2	2		1	2	1	1	93 46.5%		
Yam	1		1	2	2	2	1	1	1				
Bushmeat			1	1	2								
Maize		1	1	2	2	2	1	1	1	1			
Vegetables		1	1		2			1	1				
Fruit				2	4	1	1	1	1				
TOTALS	20	20	20	20	20	20	20	20	20	20	200	100%	

X. References

- Agyeman, V.K. 1994. *Land, tree and forest tenure systems: Implications for forestry development in Ghana*. African Development Research Report Series.
- Agyemang, M.M.O. 1996. *The Leaf Gatherers of Kwapanin, Ghana*. Forest Participation Series No. 1: International Institute for Environment and Development. Forestry and Land Use Programme, London.
- Appiah, M., Blay, D., Damnyag, L., Dwomoh, F.K., Pappinen, A., and Luukkanene, O. 2009. Dependence on forest resources and tropical deforestation in Ghana. *Environmental Development Studies* (11) 471 – 487.
- Bebbington, A. 1999. Capitals and Capabilities: A Framework for Analyzing Peasant Viability, Rural Livelihoods and Poverty. *World Development* 27(12) 2021-2044.
- Beer, J.H. de and McDermott, M.J. 1989. The economic value of non-timber forest products in Southeast Asia. Amsterdam: Netherlands Committee for IUCN.
- Belcher, B. M. 2003. Comment: What isn't an NTFP? *International Forestry Review*, 5(2), 161–168.
- Belcher, B & Schreckenberg, K. 2007. Commercialization of Non-timber Forest Products: A Reality Check. *Development Policy Review*, 25 (3), pp. 355-377.
- BirdLife International. 2009. Important Bird Area factsheet: Tano-Offin Forest Reserve, Ghana. Downloaded from the Data Zone at <http://www.birdlife.org> on 4/7/2009
- Blay, D. 2004a. Chewing Sticks. In Lopez, C. and Shanley (eds), P. 2004. *Riches of the Forest: For Health, Life and Spirit in Africa*. Centre for International Forestry Research: Indonesia.
- Blay, D. 2004b. Dental hygiene and livelihoods: a case of chewing sticks in Ghana. In Sunderland, T. and Ndoye, O. (eds). 2004. *Forest Products, Livelihoods and Conservation: Case studies of non-timber forest product systems*. CIFOR: Jakarta.
- Boakye, K.A. and Baffoe, K.A. 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Case study from Ghana. Prepared for the regional workshop on Trends in Forest Ownership, Forest Resource Tenure and Institutional Arrangements in Africa, held in Nakuru, Kenya from 19 to 21 October 2006.
- Brosius, J. P., Tsing and Lowenhaupt, A. 1998. Representing Communities: Histories and Politics of Community Based Natural Resource Management. *Society and Natural Resources* 11(2).
- Bryman, A. 1984. The Debate about Quantitative and Qualitative Research: A Question of Method or Epistemology? *The British Journal of Sociology* 35(1) 75 – 92.
- Chambers, R. 2007. From PRA to PLA and Pluralism: Practice and Theory. IDS Working Thesis, no. 286. Institute of Development Studies, Brighton.
- CRMU (Collaborative Resource Management Unit). 2004. A Briefing Document on Collaborative Resource Management in Ghana. Wildlife Division of the Forestry Commission: Accra.
- Cunningham, A. 2004. Bush Meat. In Lopez, C. and Shanley (eds), P. 2004. *Riches of the Forest: For Health, Life and Spirit in Africa*. Centre for International Forestry Research: Indonesia.

DFID (Department for International Development). 1999. Sustainable Livelihoods Guidance Sheet. [Online] Available at: <http://www.nssd.net/references/SustLiveli/DFIDapproach.htm> . [Accessed 16 November 2009].

Falconer, J. 1992. *Non-timber forest products in Southern Ghana: A Summary Report*. ODA Forestry Series No.2. Natural Resources Institute: Kent.

FAO (Food and Agricultural Organization of the United Nations). 1997. Guide for the conduct of the constraints analysis component. Document W8016/E. [Online] Available at: <http://www.fao.org/docrep/W8016E/w8016e00.htm#Contents>. [Accessed 7 July 2009].

FAO (Food and Agricultural Organization of the United Nations). 1999. Towards a harmonized definition of non-wood forest products. In *Non-Wood Forest Products and Income Generation*. 1999. FAO Corporate Document Repository, issue 198.

FAO (Food and Agricultural Organization of the United Nations). 2008. What are non-wood forest products? [Online] Available at: <http://www.fao.org/forestry/6388/en/> [Accessed 13 May 2009].

FC (Forestry Commission). 2008. *Collaborative Forestry Management: Legal Issues and Practical Prospects – Forum Experiences*. Cooperation of the Republic of Ghana and Germany. Forestry Commission of Ghana.

Forests Ordinance CAP 157. 1927. Gold Coast (Including Togoland under United Kingdom Trusteeship). Revised edition, 1954, Prepared under the authority of the Revised Edition of the Laws Ordinance, 1951. [Online] Available at: http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=035376&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL [Accessed 20 August 2009].

Forest Protection Decree. 1974. N.R.C.D.243, National Redemption Council (Establishment) Proclamation, 1972. [Online] Available at: http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=035370&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL. [Accessed 20 August 2009].

Ghana, Republic of. 1992. The Constitution of the Republic of Ghana, 1992. Judicial Service of Ghana. [Online] Available at: http://www.judicial.gov.gh/constitution/second_schedule/home.htm [Accessed 15 October 2009].

GSPD (Ghana Society of the Physically Disabled) 2009. Map image. [Online] Available at: http://www.gspd-offinso.com.gh/gspd_contact.htm [Accessed 10 June 2009].

Hawthorne, W.D. and Musha, A.J. 1993: *Forest Protection in Ghana*, Forest Inventory and Management Project, Planning Branch, Forestry Department, Kumasi, Ghana and ODA, UK, p. 64 plus appendices A-C.

Higman, S., Mayers, J., Bass, S., Judd, N. and R. Nussbaum. 2005. *The Sustainable Forestry Handbook: A practical guide for tropical forest managers on implementing new standards*. 2nd. Earthscan: London.

IIED 1993: *Study of Incentives for the Sustainable Management of the Tropical High Forest of Ghana*. International Institute for Environment and Development, London, p.249. Unpublished.

Inkoom, D.K.B., Okae Kissiedu, K. and Owusu Jnr., B. 2005. *Alternative Livelihoods and Sustainable Resource Management*. Tropenbos International: Wageningen.

Insaadoo, T. 2009. Photo Credit. Indoor grasscutter housing. Tropenbos International Ghana, 2009.

- Kellert, S.R., Metha, J.N., Ebbin, S.A. and Lichtenfeld, L.L. 2000. Community Natural Resource Management: Promise, Rhetoric and Reality. *Society and Natural Resources* 13(2000) pp. 705-715.
- Kyereh, B. 2007. Tano Offin Globally Significant Biodiversity Area: Management Plan 2007 – 2011. Forestry Commission of Ghana and the Global Environment Facility. Forestry Commission: Accra.
- Lemos, M.C. and Agrawal, A. 2006. Environmental Governance. *Annual Review of Environmental Resources* 31(2006) pp. 297–325.
- Marfo, E. 2009. *Security of tenure and community benefits under collaborative forest management arrangements in Ghana: A country report*. CSIR – INSTI: Accra.
- Mendelson, S., Cowlshaw, G. and Rowcliffe, J. M. 2003. Anatomy of a Bushmeat Commodity Chain in Takoradi, Ghana. *The Journal of Peasant Studies*, 31 (1) pp. 73-100.
- MLNRa (Ministry of Lands and Natural Resources) 2009. Mr. Collins Dauda, Minister. [Online] Available at: http://ghana.gov.gh/ministry_of_lands_forestry_mines [Accessed 30 May 2009].
- MLNRb (Ministry of Lands and Natural Resources) 2009. Ghana – Forest and Wildlife Policy 1994. [Online] Available at: http://www.fcghana.com/publications/laws/forestry_wildlife_policy/index.html [Accessed 15 August 2009].
- Morgan, G. and Smircich, L. 1980. The Case for Qualitative Data. *The Academy of Management Review* 5(4) 491 – 500.
- Nichols, P. 1991. *Social Survey Methods: A Guide for Development Workers*. Oxfam Publishing: Oxford.
- Ogbaharya, D.G. 2006. A Capability Theory of CBNRM: the case of Namibia's Communal Conservancy Program. Paper prepared for the 2006 *International Conference of the Human Development and Capability Association* on "Freedom and Justice", Groningen, The Netherlands, August 29-September 1.
- Opoku, K. 2006. *Forest Governance in Ghana: An NGO Perspective*. A report produced for FERN by Forest Watch Ghana, March 2006. www.fern.org. FERN: Brussels.
- Oteng-Amoako, A. and Obiri-Darko, B. 2000. *Rattan as sustainable industry in Africa: The need for technological interventions*. Paper presented at International Rattan Seminar in Limbe, Cameroon, 1-4 February 2000.
- Owubah, C.E., Le Master, D.C., Bowker, J.M. and J.G. Lee. 2001. Forest tenure systems and sustainable forest management: the case of Ghana. *Forest Ecology and Management* 149(2001), pp. 253-264.
- Pesseat, S. 2003. Photo Credit. *Thryonomys swinderianus*. Un aulacode adulte. Centre de coopération internationale en recherche agronomique pour le développement. [Online] Available at: <http://dabac.cirad.fr/biblio/photo.html> [Accessed 20 January 2010].
- Peters, C.M. 1996. *The ecology and management of non-timber forest resources*. World Bank Technical Paper 322. The World Bank, Washington D.C.
- PROFOR (Programs on Forests). 2008. Poverty-Forests Linkages Toolkit 2008. Washington D.C. [Online] Available at: <http://www.profor.info/profor/activities/livelihoods>. [Accessed 28 June 2009].

Ros-Tonen, M.A.F. 2000. The role of non-timber forest products in sustainable tropical forest management. *Holz als Roh- und Werkstoff* 58.

Ros-Tonen MAF, Wiersum KF (2005) The scope of improving rural livelihoods through non-timber forest products: an evolving research agenda. *Forests, Trees, and Livelihoods* 15(2):129-148.

Sarkodie, A.S. and Agyapomaa, A. 2005. Grasscutter Rearing Training Manual, Brong Ahafo Regional grasscutter farmers association, meeting in Nkwaankwaa 26th Aug – 4th Sept 2005. Market Oriented Agricultural Programme (MOAP): Suyani, Ghana.

Sawyerr, L.C. and Opoku, K.A. 1992. *Practical Guide to Snail Farming*. Compu Desktop Services: Accra, Ghana.

Sen, A. 1999. *Development as Freedom*. Anchor Books: New York.

Sunderland, T. 2004. Rattan. In Lopez, C. and Shanley (eds), P. 2004. *Riches of the Forest: For Health, Life and Spirit in Africa*. Centre for International Forestry Research: Indonesia.

Sunderlin, W.D., Angleson, A., Belcher, B., Burgers, B., Nasi, R., Santos, L. and Wunder, S. 2005. Livelihoods, Forests, and Conservation in Developing Countries: An Overview. *World Development* 33(9) pp. 1383-1402.

Townson, I.M. 1995. *Incomes from Non-Timber Forest Products: Patterns of Enterprise Activity in the Forest Zone of Southern Ghana, Summary Report*. Oxford Forestry Institute, Department of Plant Sciences, University of Oxford, UK.

Treue, T. 2001. *Politics and Economics of Tropical High Forest Management: A case study of Ghana*. Kluwer Academic Publishers: Dordrecht.

Wiggins, S., Marfo, K. and Anchirinah, V. 2004. Protecting the Forest of the People? Environmental Policies and Livelihoods in the Forest Margins of Southern Ghana. *World Development* 32(11) 1939-1955.

World Bank. 2001. *A revised forest strategy for the World Bank Group*. Draft. Washington, DC, USA, World Bank.

World Bank. 2001. *World Development Report 2000/2001: Attacking Poverty*. Oxford & New York: Oxford University Press.