Fighting over forest: interactive governance of conflicts over forest and tree resources in Ghana’s high forest zone

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Research design and methodology

Introduction

This chapter provides an overview of the research design and methods that guided data collection and analysis. The next section describes the research design, highlighting the rationale for selecting a case study approach and justifying the selection of the study areas, units of analysis and sampling methods. After that, the data collection methods and sources are examined, issues of validity and reliability addressed and limitations and ethical considerations of the research presented. Finally, the chapter deals with the techniques used for data analysis.

Research design

‘Research design’ refers to the underlying plan or protocol for carrying out the research (Maxwell 2005: 2). It encompasses (i) the justification of research objectives and questions (discussed in Chapter 1), (ii) the conceptual framework and underlying theories (addressed in Chapter 2), (iii) the rationale that underpins the study design, (iv) the rationale that underpins the choices as regards participants, time and places of data collection, and (iv) concerns related to validity and reliability (Maxwell 2005).

According to Trochim (2006) the research design joins the various parts of the research in order to address the central research question (see Figure 3.1). In order to enable a holistic and in-depth investigation (Orum et al. 1991) of representative conflict situations regarding forest and tree resources and of conflict management strategies in Ghana’s high forest zone, this study combined a case study approach with a mixed methods approach (i.e. a combination of quantitative and qualitative methods). These instruments guided the analyses of (i) the challenges and opportunities in forest governance processes, (ii) the nature of conflict and conflict management strategies (i.e. issues, actors, causes, dynamics and prevailing strategies), and (iii) the options of identifying constructive conflict management strategies and governance mechanisms to minimise forest conflicts and improve forest governance process in the sector.
The rationale for selecting a case study approach

A case study approach is capable of providing in-depth knowledge and insights for informed decision making. It facilitates an understanding of a complex, interdependent and dynamic social phenomenon like natural resource conflicts, in which multiple actors compete for scarce resources. Yin (1984: 23) defines a case study as ‘... an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.’

Several authors outline qualities of a case study approach that are particularly relevant to this study. First, in terms of the research objective, it satisfies the exploratory, descriptive and explanatory interpretation of data (Yin 1994: 4, Tellis 1997: 6).

Second, as a methodology, it is responsive to research questions of ‘why’ and ‘how’ (Tellis 1997: 4), and also covers both process and outcomes because of the use of both quantitative and qualitative data (Ibid.: 4).
Third, case studies provide the platform for multi-perspective analyses during which researchers consider not only the views of actors but also the interactions between them (Ibid.: 5).

Finally, its ability to accommodate a variety of research designs, data collection techniques, epistemological orientations and disciplinary perspectives makes it particularly relevant to any analysis of such a complex subject as forest and tree resource conflicts.

Forest conflicts are complex and related to issues like institutional failures, inadequate and inefficient punitive conflict management mechanisms, lapses in governance processes, the multiple interests of parties in the sector, declining forest resources, inequitable benefit sharing, poverty in rural areas, land scarcity etc. as in the context of agriculture, mining and herding (Buckler & Rusnak 1999, Tyler 1999, Warner 2000, Ohene-Gyan 2004, Yasmi 2010, Ros-Tonen et al. 2010, see also Chapter 2). Understanding and analysing such complexities, diversity and interdependencies in space and time requires the study of several specific cases and various sources of evidence and perspectives of the situation.

Despite the limitations of a case study approach in terms of generalising research findings, there is a counter-argument that generalisation of case study findings is legitimate based on the researcher’s understanding of the issue. Tellis (1997: 5) believes that the generalisation problem can be overcome by triangulating the study with other methods in order to confirm the validity of the process. Yin (2003) also indicated that results from case studies could be generalised through theory and by employing multiple case studies in order to strengthen or broaden analytical generalisations.

A mixed method approach was used in order to triangulate quantitative data obtained from structured and semi-structured survey questionnaires with actors’ perceptions of conflict issues and dynamics. Qualitative data was obtained by employing research methods like focus group discussions, community meetings and stakeholder workshops, structured and semi-structured interviews, field observations and document analysis.

Justification of the selection of study sites
Though small in terms of size compared to the savannah zone, the cases were selected from Ghana’s high forest zone as it is the area where most of Ghana’s forests can be found and where most conflicts and illegalities occur with regard to the utilisation and management of forest and tree resources.

Among the 204 forest reserves in Ghana’s high forest zone, cases were selected from the Tano-Offin forest reserve because, first, it is a reserve area designated simultaneously for the protection, production and plantation regimes, whereas off-reserve areas can be found in its surroundings where timber utilization contracts have been issued. Second, it is a reserve area where most forest and tree-based livelihoods can be found, including the modified taungya system, non-timber forest product (NTFP) and fuelwood extraction based on communal rights and on permits for commercial collection, logging based on timber utilisation contracts and illegal chainsaw lumbering and farming. Third, the inventory stage of the research revealed a considerable number of forest conflicts in this area, whereas little or no research had been done on the subject matter. Secondary considerations that influenced the selection of this forest reserve included distance and accessibility with regard to undertaking fieldwork within the limited timeframe for the completion of the research, and the possibility of linking up with other Tropenbos International Ghana researchers (notably Thomas Insaidoo) in order to enable the exchange
of relevant information. A detailed description of the study area as a whole (i.e. the high forest zone and its environs, see Figure 1.1) is given in Chapter 4, where the area is analysed as ‘the system-to-be-governed’. In addition, each subsequent chapter briefly describes the specific study site that is subject to analysis in that chapter.

The Tano-Offin forest reserve falls under two administrative districts, namely Atwima Mponua and Ahafo-Ano South, which represent the southern and northern portions of the reserve respectively. Forty-two communities border the reserve, including the ‘admitted’ village\(^1\) of Kyekyewere, which is located inside the reserve. Three communities from Atwima Mponua administrative district and one from Ahafo Ano South administrative district were selected as case study sites for an in-depth analysis of conflicts over forest resources and conflict management strategies at local forest government level. Their selection was primarily based on the prevailing management regime to ensure that it was representative of each of the four management regimes – protection, plantations, production and off-reserve area (see Table 3.1 and Figure 3.2). Secondary selection criteria related to location and accessibility. Kyekyewere was the only village located in a strictly protected area and was selected for that reason. Chirayaso and Nyamebekyere No. 3 were selected because of their active involvement in the modified taungya system (plantation regime) and ongoing timber harvesting (production regime) in which the inhabitants had to encounter timber contractors in negotiating social responsibility agreements and compensation for crop destruction in off-reserve areas. Awisasu was selected because a timber contractor was active in the off-reserve area at the time of data collection (2009). All these selections were made with assistance from the FSD range supervisors.

<table>
<thead>
<tr>
<th>Forest reserve</th>
<th>Study community</th>
<th>Administrative district</th>
<th>Forest management regime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tano-Offin</td>
<td>Kyekyewere</td>
<td>Atwima Mponua</td>
<td>Protected management regime – GSBA(^a)</td>
</tr>
<tr>
<td></td>
<td>Chirayaso and</td>
<td>Atwima Mponua and Ahafo Ano South</td>
<td>Plantation management regime – the modified taungya system</td>
</tr>
<tr>
<td></td>
<td>Nyamebekyere No. 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chirayaso and</td>
<td>Atwima Mponua and Ahafo Ano South</td>
<td>Production management regime</td>
</tr>
<tr>
<td></td>
<td>Nyamebekyere No. 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awisasu</td>
<td>Atwima Mponua</td>
<td>Tano-Offin off-reserve area</td>
</tr>
</tbody>
</table>

\(^a\)GSBA = Globally Significant Biodiversity Area.

**Units of analysis**

The unit of analysis is the major entity analysed in a study. Trochim (2006) outlines five key units that may be analysed, including individuals, groups, artefacts (books, photos, and newspapers), geographical units (town, census tract, state) and social interactions (e.g. divorces and arrests). This study employed three main units of analysis:

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\(^1\) Admitted villages refer to the rights of people who had their village in the reserve area before its designation as a reserve to continue inhabiting the designated areas. Similarly, the law recognises admitted farms in forest reserves to preserve the right to farm.
1. In terms of geographical unit, data was collected and analysed at (a) the sub-national level of Ghana’s high forest zone and (b) district and village levels in both on and off-reserve forest areas.

2. In terms of actors, data was collected at individual level with analysis being based on actors’ perspectives.

3. In terms of social interactions, the units of analysis were conflicts over forests and tree resources, conflict management strategies and forest governance arrangements.

**Sampling methods**

Eisenhardt (1989) states that the issue of population is extremely crucial when selecting cases because the population defines the set of entities from which the research sample is to be drawn. The selection of appropriate population controls and extraneous variation helps to define the limits for generalising findings. The population of interest for this study were actors involved in forest and tree use and management in Ghana’s high forest zone, more specifically actors that engage in conflicts and manage conflict incidences related to forest and tree resources at community, district, regional and national levels.

The selection of respondents for the study was based on the actor analysis discussed in Chapter 2.
Respondents representing the traditional or customary governing structure

The communities around the Tano-Offin forest reserve were first arranged into groups from the northern and the southern zone in accordance with their location in the two administrative districts. Community consultations began in November 2008 and involved two representatives each from the 42 communities across the Ahafo Ano South and Atwima Mponua districts which are in the northern and southern parts of Tano-Offin reserve respectively. With assistance from the Forest Services Division range supervisors in charge of the reserve, respondents were purposively selected from the following stakeholder groupings: farmers engaged in the modified taungya system (MTS), NTFP collectors, chainsaw operators, traditional authorities, farmers with planted/nurtured trees on farmlands, members of community forest committees (CFCs), community biodiversity advisory groups (CBAGs), and community members who have had experienced forest conflicts with internal or external actors. In order to minimise biases, the selection was made by the community elders in the presence of the research assistants who were familiar with all the villages. Furthermore, care was taken to ensure that the selected respondents actually represented the aforementioned stakeholder categories. Gender equity was also ensured.

The respondents in each of the three case study communities in the forest reserve were selected randomly for the survey interviews using a simple random technique without replacement and a sample size ranging from 19-26% of the total adult population in the villages (see specifications for each study earlier in this chapter). During community meetings held prior to the survey, the inhabitants were briefed on the issues to be discussed during the survey. The survey in each community was conducted with the support of four research assistants: three male students from the Kwame Nkrumah University of Science and Technology and a female with an MSc in Water Management. The researcher discussed the survey questionnaire with the research assistants in order to have a common understanding of the issues at stake prior to testing. During the testing, the researcher seized the opportunity to introduce the assistants to the community members. In each of the communities, a maximum of two weeks was spent on administering the questionnaires.

The sampling procedure was different for the population in the off-reserve area, where data was collected through community meetings and focus groups and respondents were purposively selected from farmers with trees on their farm or fallow lands (see Chapter 10). In this location, the researcher led the discussions with the support of two field assistants and an FSD range supervisor who took notes of the discussions and helped to conduct interviews with the farmers. In each of the communities, fieldwork was carried out during a maximum of three months, but the time spent in each study location was not continuous since data collection at community level involved a series of approaches including familiarisation visits, consultations with communities’ representatives, the survey, interviews and a validation meeting. This enabled continuous reflection on the data gathered before the next step was taken in the data collection process.

Purposive sampling was also used to select the respondents belonging to the categories below. According to Trochim (2006), most sampling methods are purposive in nature because researchers usually approach the sampling problem with a specific plan in mind.
– Respondents representing the market governing structure
Within this framework focus group meetings were held and telephone interviews conducted with four timber contractors operating in Tano-Offin and its environs. An interview was also held with an official of the Ghana Timber Association (GTA) based in Kumasi.

– Respondents representing the statutory governing structure
Forest governors and experts were purposively selected for the studies presented in Chapters 5 and 6. Forest governors are defined in this study as actors in the formal forest sector mandated to formulate policies and implementation of policy strategies in Ghana. Those considered as experts were representatives of governmental, non-governmental institutions and individuals who have a role or stake in forest and tree management in Ghana. Among the key actors involved in this study were representatives of the mandated institutions such as (i) the Ministry of Lands and Natural Resources (MLNR), (ii) the Forestry Commission (national level), (iii) the Forest Services Division (FSD), (iv) the Wildlife Division and (v) the Resource Management Support Centre (see Chapter 5, Figure 5.1 for an organogram explaining how these organisations relate to each other). Other institutions involved in this study are those at local government level that are engaged in law enforcement and prosecution, land use and research, such as the Judiciary, the Ghana Police Service, the Ministry of Food and Agriculture (MOFA), the Lands Valuation Division and the Faculty of Renewable Natural Resources at Kwame Nkrumah University of Science and Technology (KNUST) (see Chapter 5 for a more detailed analysis of the statutory governing structure).

– The civil society governing structure
Some staff of non-governmental organisations (local and international) based in Ghana were involved in the study through interviews, survey and a consultative workshop. Among them are Tropenbos International Ghana, the International Network of Bamboo and Rattan (INBAR), the International Union for the Conservation of Nature (IUCN) and the Rural Development Youth Association (RUDIEYA).

– The hybrid governing structure
Under this structure, representatives of two institutions at national level – the Community Resource Management Area (CREMA) and the National Forest Forum – were purposively selected for this study. The same was done for two hybrid organisations at community level – the Community Biodiversity Advisory Groups (CBAGs) and Community Forestry Committees (CFCs).

– The transnational governing structure
Interviews were held with officials from organisations such as the Royal Netherlands Embassy, the Agriculture Development Bank, German Technical Cooperation (GTZ) and the World Bank, especially with regard to their contributions to Ghana’s forest governance process and conflict management.
Data collection methods and sources

This study employed mixed methods (i.e. quantitative and qualitative methods) with different research techniques in the data collection process, including community meetings, a survey, a self-completion questionnaire, interviews, validation meetings and workshops (see Appendix 1 for the questions guiding the various cases). As stated above, the main rationale for the use of mixed methods research in this study was to obtain a complete and comprehensive picture of forest resource conflicts and conflict management strategies from diverging actor perspectives and to enable triangulation of quantitative data with qualitative data.

Primary data was obtained from the actors discussed in the section on sampling methods. Secondary data came from published and unpublished data sources from local, national and international levels. Most of these sources concern policies, laws and regulations (statutory and customary), conflicts and conflict management, governance arrangements at national levels and actors in the forest sector. Other relevant data sources at the district level included:

- Unreported court judgements related to forest resources offence cases.
- Official documents at Nkawie Forest District relating to documented offence cases in the forest reserves and off-reserve areas.

At community level the MTS sites in the villages of Chirayaso and Kunsu Nyamebekyere No. 3 were visited to observe the state of the plantation developments in order to appreciate some of the conflict issues reported by the respondents.

Data collection techniques and respondents for each study

Chapters 4 to 11 are the empirical chapters of this research. Each chapter is a study in its own right with its specific research population, mode of data collection and data analysis. This section presents an overview of the empirical studies in Figure 3.2 and a further elaboration of the thematic issues dealt with in each chapter and the data collection methods on which they are based.

– Study 1: The system-to-be-governed (Chapter 4)

Chapter 4 is based on a review of literature, policy documents and internet sources which focused on Ghana’s high forest zone and the Tano-Offin forest reserve as the natural sub-system under the system-to-be-governed. Inception meetings with representatives of 42 communities living within and bordering Tano-Offin forest reserve were held in November 2008, for which letters and information were sent to the various communities to invite two representatives each to attend this meeting. In the same month, a meeting with representatives of government institutions (i.e. the FSD, MOFA, Judiciary, District Assemblies and Police) at the Nkawie Forest District was held that, together with the inception meeting with community representatives, contributed to the data on the socio-economic sub-system. This sub-system describes the local communities under the traditional governing structure and actors pertaining to the market governing structure (i.e. Timber Utilisation Contract (TUC) holders, illegal loggers and millers, hunters and traders in plant NTFPs etc.).

– Study 2: The governing system (Chapter 5)

The information in this chapter is based on a review of literature and a survey based on interviews and a workshop with forest governors and experts and transnational organisations aimed at obtaining data on their knowledge, views and perceptions of forest
First, it drew from secondary data sources which focused on the changing paradigms of forest governance process over the past decades. Second, informal interviews were held with key persons in the Ghanaian forest sector to identify relevant governance issues and, based on these, self-completion semi-structured questionnaires were administered between March and June 2009 to 30 forest governors randomly selected across the formal forest sector in the high forest zone. These involved representatives of the forest managers at district, regional and national level institutions, such as the Ministry of Lands and Natural Resources, the Forest Services Division (FSD) across the five regions and five forest districts in the high forest zone, officials from the Resource Management Support Centre (RMSC) and the Forestry Commission headquarters. Eleven of the 30 respondents returned the questionnaires. These included forest guards, technical officers, district managers and regional managers within the formal sector. The core enquiry was on the nature of conflicts associated with forest and tree-based livelihoods in Ghana’s high forest zone, prevailing conflict management strategies and their challenges and potential for improving existing conflict management strategies.

In order to compensate for the low response rate and to ensure triangulation, the third step was the organisation of a dissemination and consensus workshop for forest governors and experts at the Wood Industry Training Centre (WITC) in Kumasi, Ghana, in February 2010 with the support of staff of Tropenbos International Ghana. During this workshop, the results of the survey were presented for discussion and validation. The workshop was attended by 25 experts in professional forestry practices and academia, including representatives of the FSD, RMSC, Kwame Nkrumah University of Science and Technology (KNUST), Tropenbos International (TBI)-Ghana and the International Network for Bamboo and Rattan (INBAR). In August 2010 additional face-to-face interviews were conducted with representatives of the MLNR, FC headquarters, Ghana Timber Association (GTA), Dutch Embassy, GTZ and IUCN, using the same semi-structured questionnaire with a view to increasing the number of respondents and stakeholder representation. Finally, the Forest Investment Project Joint Mission meeting that was held from 30 May to 6 June 2011 was used to expand the number of survey respondents using the self-completion questionnaire. This involved five respondents from the World Bank, African Development Bank, Environmental Protection Agency, the National Forestry Forum and the Community Resource Management Area (CREMA). This increased the number of respondents for the survey and interviews to a total of n = 22.

Study 3: Forest governors and experts’ views of conflicts and conflict management (Chapter 6)
The study was carried out in four stages which partly overlap with those in Study 2. First, a desk study was carried out and informal interviews were held with key persons in the Ghanaian forest sector to identify relevant issues in conflicts in Ghana’s high forest zone. The second and third stages encompass the self-completion semi-structured questionnaires and the dissemination and consensus workshop described above. The participants in the workshop used the opportunity to develop action plans on two key challenging issues identified in the survey findings that hinder constructive conflict management as well as the forest governance process. For this process, the results of which are presented in Chapter 6, the participants were divided into two groups. The first group assessed the potential of re-introducing the forest prosecution system (a system that enables resource managers to be trained in a judicial prosecution course) for
which a SWOT (strength, weakness, opportunity and threat) analysis was carried out and confrontation matrix tools were employed. The second group formulated an integrated conflict management model that could be piloted in the forestry sector. The SWOT analysis technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long-range planning processes. It generates information that is helpful in matching the goals, programmes and capacities of an organisation or group to the social environment in which it operates. The confrontation matrix is a tool which can be used to combine the internal factors (strengths and weaknesses) and the external factors (opportunities and threats) to identify the main points for attention (Kuiper 2006). The fourth step in this study comprised additional face-to-face interviews conducted in August 2010, using the same questionnaire that was previously used as a self-completion form. These additional interviews were held with a view to increasing the number and representation of the study respondents, especially those from the MLNR and the FC headquarters. This increased the number of respondents for the survey and interviews to a total of n = 15.

– Study 4: The protected forest area (GSBA) (Chapter 7)
Data for this study was collected from September 2008 to February 2010. Secondary data from official documents provided information about the institutional and legislative instruments and strategies used to govern the resources (i.e. the governing system). Community meetings provided an insight into local inhabitants’ perceptions of the governing systems operating within the reserve and enabled us to list the number of people to be sampled for the survey. The survey, which was conducted in June-July 2009, involved 119 individuals made up of 70% males and 30% females were selected using a simple random technique without replacement to respond to the semi-structured questionnaire from an adult population of 450. The skewed gender distribution in the study was due to the probability nature of the technique employed and to fewer women being present during the sampling process. The survey issues centred on the socio-economic characteristics of the respondents, types of forest resources that contribute to livelihoods, the nature of conflicts and the prevailing management strategies. In February 2010 a validation meeting was organised with representatives of the admitted village of Kyekyewere to fine-tune the findings.

– Study 5: The plantation area: the modified taungya system (MTS) (Chapter 8)
The study employed mixed data collection methods involving three steps carried out between 2008 and 2011. Step one was a literature review and assessment of legal documents on the MTS. This provided the study context. The second step was a visit to the study villages where meetings were held with the inhabitants to introduce the research concepts and objectives and to visit the MTS sites in the reserve. Based on the familiarisation meetings, the baseline data gathered contributed to the design of the semi-structured questionnaire. Using a survey approach, the semi-structured questionnaires were administered to 212 respondents randomly selected in the two villages in 2010 as shown in Table 3.2.

The survey focused on the socio-economic characteristics of the respondents, the contribution of the MTS to their livelihoods and the prevailing challenges. The respondents were asked about the nature of conflicts in the MTS and conflict management

2 URL: [http://www.cipd.co.uk/subjects/corpstrty/general/swot-analysis.htm](http://www.cipd.co.uk/subjects/corpstrty/general/swot-analysis.htm) (accessed on March 2010).
strategies employed during conflict incidences. The third step involved meetings with 36 and 45 community members respectively in the two villages to validate the survey findings and discuss additional issues related to anticipated conflicts and strategies to overcome them. In view of the anticipated conflicts mentioned, it was considered necessary to hold informal interviews in January 2011 with four officials from the Resource Management Support Centre (RMSC) and the FSD about strategies (planned or already put in place) to minimise some of the conflicts anticipated by the MTS farmers.

Table 3.2 Estimated adult population, number of respondents in the semi-structured survey and participants in community validation meetings in the study villages in study of MTS

<table>
<thead>
<tr>
<th>Village</th>
<th>Estimated adult population* (&gt;18 years)</th>
<th>Number of respondents in the survey (N = 212)</th>
<th>Estimated number of people present for validation meeting (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chirayaso</td>
<td>770</td>
<td>94 (n = 192)</td>
<td>36</td>
</tr>
<tr>
<td>Kunsu-Nyamebekeyere No. 3</td>
<td>240</td>
<td>98 (n = 192)</td>
<td>45</td>
</tr>
</tbody>
</table>

** In this study, the respondents identified eleven conflict issues which the researcher grouped into three main categories for easy analysis (see Chapter 8 for more details). Institutional conflicts refer to conflicts within MTS groups and between taungya leaders and farmers (e.g. about disproportional allocation of MTS plots). Competing claims refer to conflicts between MTS farmers and other actors (e.g. hunters and chainsaw operators). Anticipated conflicts are related to uncertainty about the future, notably in relation to the sharing of future timber benefits.

– Study 6: The production area (Chapter 9)
Data for this study was collected from September 2008 to February 2010. Secondary data from official documents provided information about the institutional and legislative instruments and strategies used to govern the resources (i.e. the governing system). Community meetings provided insight into local inhabitants’ perceptions of the governing systems operating within the reserve area and enabled us to list the number of people to be sampled for the survey. Of the 212 respondents who responded to the questions on the plantation (MTS) area in Study 5, 137 individuals representing 56% males and 44% females also responded to questions regarding production regime conflicts and conflict management (Table 3.3).

The survey issues centred on the socio-economic characteristics of the respondents, types of forest resources that contribute to their livelihoods, the nature of conflicts and prevailing management strategies. In February 2010, a validation meeting was organised with representatives of the two villages to fine-tune the findings.

– Study 7: The off-reserve area (Akyikon off-reserverange) (Chapter 10)
Chapter 10 is based on document analysis, a meeting with 45 inhabitants of Awisasu community, a semi-structured questionnaire with 17 farmers and a telephone interview with the timber contractor in 2009. Prior to this, a focus group meeting was held with three off-reserve timber operators in the environs of the Tano-Offin forest reserve in November 2008. The views of the off-reserve issues that emerged from this meeting are also presented in Chapter 10. Another community meeting was conducted in 2010 to validate the findings. Even though there were no conflicts between the timber operator and the farmers, the apparent issue was how much compensation should be paid and
who should mediate during compensation payment negotiations. Informal interviews were therefore organised with officials of the District Forest Services Division, the District Ministry of Food and Agriculture (MOFA) and the Land Valuation Division of the Land Commission of Ghana. The interviews focused on their perceptions of their role in the compensation negotiation process in off-reserve tree management.

**Table 3.3** Estimated adult population, number of respondents in the semi-structured survey and participants in community validation meetings in the study villages in the production area

<table>
<thead>
<tr>
<th>Village</th>
<th>Estimated adult population* (&gt;18 years)</th>
<th>Resource-based conflict category (n = 158)**</th>
<th>Operational conflicts within TUC and permit holding areas (n = 37)**</th>
<th>Land-based conflict category (n =20)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chirayaso</td>
<td>770</td>
<td>98</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Kunsu-Nyamebekyere No. 3</td>
<td>240</td>
<td>60</td>
<td>28</td>
<td>14</td>
</tr>
</tbody>
</table>

** N=137; respondents were able to answer questions related to more than one issue.

In this study, the respondents identified nine conflict issues which the researcher grouped into three main categories for easy analysis (see Chapter 9 for details). Resource-based conflicts are conflicts on issues such as chainsaw milling, hunting and the gathering of non-timber forest products. Operational conflicts within timber utilisation contract (TUC) and permit holding areas involve log theft and conflicts over the fulfilment of the social responsibility agreement. The land-based conflict category encompasses issues such as illegal farming and boundary disputes.

– Study 8: Forest offences and court judgements (Chapter 11)

Chapter 11 is based on document analyses of forest laws, a compilation of offences from offence records at the Nkawie Forest District from 2005-2010 and a compilation of court judgements on 12 forest cases in the Nkawie, Nyinahin, Mankranso Districts Courts and Kumasi Circuit Court in 2010. Furthermore, data for Chapter 11 is based on semi-structured interviews with 19 officials of the Forestry Commission, Ghana Police Service and the Judiciary mostly at Nkawie Forest District. The questions of enquiry centred on their perceptions of factors that facilitate and hinder effective forest law enforcement and sanctions in the law court.

**Validity**

According to Trochim (2006), validity is the “best available approximation to the truth of a given proposition, inference, or conclusion”. Hosker (2001) defines it as the ability of the research instruments to gather information on the “concepts it claims to be measuring”. In this study, several steps were taken to ensure construct, external, internal and conclusion validity, which are cumulative. The most important of these were:

Methodological, theoretical and data triangulation by using mixed methods, adapting concepts taken from different disciplines such as interactive governance theory applied to fisheries (Kooiman *et al.* 2005) and conflict theories, and by collecting data from different actors and other relevant sources.
1. Gathering data beyond the direct environs of the Tano-Offin forest reserve and the Nkawie Forest District, in order to ensure that the results of this research could be generalised for the high forest zone as a whole. This was done by interviewing several actors across the high forest zone and actors operating at national level such as policymakers, representatives of international organisations, non-governmental organisations, the judiciary, the police and forest managers.

2. Checking the outcomes of this research against existing data and literature on present forest governance issues such as law enforcement, co-management and social capital.

Reliability
In its everyday sense, reliability is the ‘consistency’ or ‘-repeatability’ of the measures used in the research (Trochim 2006, Hosker 2001). In order to ensure the reliability of this study, the following measures were considered:

1. The respondents for the surveys were randomly selected from the different stakeholder groupings within the communities;

2. The survey questionnaires were piloted in order to ensure that both the researcher, the field assistants and the respondents understood the questions at issue;

3. A transparent description of the research process, primary and secondary data sources, research instruments and institutions involved in the study, so that these are available for future reference or replication of the research in the same or a different area.

Limitations of the research and ethical considerations
Although this study offers comprehensive analyses of governance arrangements, forest livelihood conflicts and conflict management strategies in Ghana’s high forest zone and its different management regimes from different actor’s perspectives, a few limitations were encountered.

1. Involving an adequate number of respondents from the market governing structure in interviews and participation in the workshop was a challenge because of their busy schedules. Nevertheless, the few who participated contributed immensely to the research issues.

2. Interactive governance theory calls for an in-depth field analysis of the natural sub-system within the system-to-be-governed in order to determine confidently the governability of the system. However, conducting an ecological inventory was beyond the scope of this study, which focuses on forest livelihoods and the conflicts arising from it. Data on the natural system was gathered mostly from ecology literature, policy documents and focus group discussions.

3. Literature indicates that conflict dynamics involves a sequence of stages categorised as ‘violent’ and ‘non-violent’ with various intensity levels (Axter al. 2006, Moore 2003). This study categorised conflict stages as non-violent and violent only, without distinguishing different levels of intensity between them. This is in line with how local people gave meanings to the term ‘conflict’. In the local language, Twi, conflict has two meanings. It is either (i) ntawatawa, which indicates a difference in opinion
or misunderstanding, or (ii) *ntokwa*, which is a violent clash or indicates a more severe conflict.

In social research, ethical issues contribute directly to the integrity of the research (Bryman 2008). In this study, four ethical concerns were observed. First, the design of the survey questionnaire clearly spelt out that respondents’ consent was needed to participate the research. They were therefore made aware of the purpose of the study and that their participation was completely voluntary. Without raising expectations about potential benefits, respondents were also informed that the study aimed to contribute to minimising forest livelihood conflicts. Second, even though respondents’ names were taken for data cross-checking where necessary, these were withheld from the thesis. The names of the forest offenders involved in cases taken from official records and presented in Chapter 11 were replaced with numbers in order to protect the privacy of the accused persons. Third, all the people in the photos presented in this thesis granted consent for the use of their pictures in this book and were informed about the intention to use the pictures for this thesis in advance. Finally, the respondents were informed about the fact that the information provided was strictly confidential, unless otherwise agreed. The findings from this study are therefore presented as aggregate data.

**Data analysis**

The data gathered during the survey was analysed in three steps, including data preparation and descriptive statistics. The data preparation involved cleaning, coding and entering answers to closed, open-ended questions and interviews for analysis. The descriptive statistics provided simple frequencies and percentages, and cross-tabulations were also used to investigate the research questions and draw conclusions from them, thereby satisfying conclusion validity. The Statistical Package for Social Sciences (SPSS) and MS Excel was used in this study and there was, undoubtedly, some subjectivity in the grouping of the answers from the open-ended questions. However, the different methods used in this research did provide a high internal consistency.

Workshop and focus group meetings outputs were content analysed to extract respondents’ views. A documentary analysis was used to analyse the secondary data gathered and the grey and academic literature. The data analysed has been presented in each of the above-mentioned cases, analysed from interactive governance and conflict theoretical perspectives. These results can be found in Chapters 4 to 11 of this thesis.