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Fighting Over Forest: Toward a Shared Analysis of Livelihood Conflicts and Conflict Management in Ghana

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Conflicts undermine forest-based livelihoods for the rural poor. Conflict management is key to preventing such conflicts. This article analyzes actor perceptions of forest- and tree-related conflicts and conflict management in Ghana's high forest zone. It also assesses a phased methodology that promotes shared problem definition and ownership of recommendations on conflict resolution strategies through the presentation and discussion of findings from document analysis, surveys, interviews, and focus-group discussions at a workshop with forest professionals held in Kumasi, Ghana. The study found that conflicts are inherent in forest-based livelihoods due to policy and legislative failures and institutional deficiencies, perceived goal incompatibility, opportunities for interfering with the attainment of one another's goals, and environmental scarcity. Ongoing forest governance reforms in Ghana should consider the stepwise conflict management model developed by the workshop participants involved in this study, but expand it to include the views of other stakeholder groups.

Keywords conflict, conflict management, forest governance, forest- and tree-based livelihoods, Ghana, high forest zone

Forest and tree conflicts and a lack of adequate conflict management present challenges to forest governance and sustainable forest management (Ostrom 1999; Yasmi 2007). In Ghana this has been investigated mainly in relation to timber

(Kotey et al. 1998; Amanor 2000; Marfo 2006), despite a lot of fighting over other forest resources. Dealing with conflicts effectively requires a shared problem definition and an in-depth understanding of conflicts over common pool resources (Adams et al. 2003). Against this background, the threefold objective of this article is to (1) analyze conflicts beyond the timber sector through a holistic approach that covers all forest-related livelihood activities that are subject to conflicts, (2) analyze conflict management and its challenges from different actor perspectives, and (3) assess a phased methodology that promotes a shared definition of problems and solutions among government officials, resource managers, and experts—together denoted as forest professionals[1] in the rest of this article. The question addressed is, "What are the perspectives of actors in Ghana's forest sector regarding forest and tree-related livelihood conflicts and conflict management options and what methodology can be used to promote a shared understanding thereof?"

After clarifying the main concepts used in this study and positioning this article in the conflict literature, the political context, study area, and methodology are elucidated. Next, the results are presented regarding actors' understanding of forest- and tree-based livelihood conflicts and conflict management options. The discussion relates the findings to theory and reflects on the implications for practice. The article concludes with recommendations.

Conflict Analysis and Management from a Theoretical Perspective

Conflicts are conceived in this article as incompatibilities in stakeholders' interests, values or priorities (Adams et al. 2003, 1916). Conflicts have various dimensions, including context, issues, actors, causes, dynamics, and conflict resolution strategies (Mason and Rychard 2005; Derkyi 2012). Regarding context, in Ghana it is important to distinguish between different forest management regimes in forest reserves and off-reserve areas. With regard to causes, Pondy (1967) refers to antecedent conditions (e.g., resource scarcity) that are particularly important in the latent stage preceding a conflict episode. Subsequent stages are an emerging stage in which one of the parties perceives a conflict and a stage of manifest conflict in which the parties behave in a way that makes the conflict observable (Pondy 1967; Tosi et al. 2000; Engel and Korf 2005). Finally, the aftermath stage (Pondy 1967; Tosi et al. 2000) reveals the consequences of conflicts, which can turn into new antecedent conditions if they remain unresolved (Pondy 1967). Dynamics vary with conflict stage, potentially culminating in violence (Engel and Korf 2005). This article clarifies antecedent conditions, manifest behavior, and consequences for several conflict types and contexts in Ghana's high forest zone.

Conflict management is needed to prevent conflicts from escalating (Buckles and Rusnak 1999; Yasmi 2007). It is used in this article for a process geared toward finding mutually satisfying outcomes for two or more conflicted parties. This article uses an adapted version of Moore's (2003) continuum of conflict management strategies, drawing from Engel and Korf (2005).[2] Consensual approaches on this continuum (negotiation, mediation) are more likely to lead to win–win outcomes than the nonconsensual ones (avoidance, arbitration, adjudication, and coercion) and are therefore generally preferred (Engel and Korf 2005). A third party (mediator) capable of helping parties examine their interests and needs, negotiate an exchange of viewpoints, or redefine their relationship in a way that is mutually satisfactory plays an important role in such approaches (Moore 2003).

Despite the desire for win–win outcomes, forest conflicts are still widespread. According to Adams et al. (2003), this is largely attributable to the fact that stakeholders with different knowledge, understandings, values, and interests tend to frame conflicts and possible solutions differently. A methodology that promotes a shared problem analysis as outlined in this article is therefore of utmost relevance to achieving a dialogue. However, such a dialogue should go beyond forest professionals and include stakeholders from local communities, nongovernmental organizations (NGOs), and timber operators.

Political Context

Forest conflicts in Ghana go back to the 1920s when forested lands were forcibly included in the forest reservation process. The colonial government gave chiefs the power to control land, natural resources, and labor services. Local people lost out as they were excluded from land that they could otherwise have used for agriculture or from negotiations about timber concessions (Amanor 2005, 17). However, those who brought the traditional leaders into power as resource managers also took away their right to negotiate timber concessions on stool lands[3] under their jurisdiction. Hence the current duality in the governance of Ghana's natural resources, with ownership of land being vested in the stool and jurisdiction over forest resources being vested in the state. The Ministry of Lands and Natural Resources (MLNR) and the Forestry Commission (FC) with its Forest Services Division (FSD), Wildlife Division (WD) and Resource Management Support Centre (RMSC) are responsible for the formulation and implementation of forest policies and regulations.

The 1994 Forest and Wildlife policy sought to promote collaboration and active involvement of stakeholders in forest governance. Nevertheless, forest- and tree-related conflicts remained widespread and preventive and mitigation measures were too weak to minimize them. Patrolling by forest guards was one means of preventing illegal encroachment and associated conflicts, but the intensity was decreased during institutional reform of the then Forestry Department.[4] Several regulations, such as Act 617, LI 1649, and Social Responsibility Agreement (SRA[5]) guidelines, state how disputes must be resolved. However, legislation favors the timber industry in that it promotes negotiation in confrontations between the FC and timber operators, but Forest Protection (Amendment) Act 624 (Ghana Law, Act of Republic, 2002) prescribes immediate court action (fines or imprisonment) for community members who access forest resources illegally.

The Forest Protection NRCD 243 (Ghana Law, NRC Decree, 1972) stipulates that community rights include continued inhabiting of "admitted villages" and cultivation in "admitted farms" that people occupied or used before their designation as a reserve. The law also recognizes communal rights, including hunting rights, footpaths to water sources, and the right to collect leaves, snails, chew-sticks, and other nontimber forest products (NTFPs) for domestic use.

Study Area

The high forest zone in southwest Ghana (Figure 1) covers about one-third of Ghana's land area (approximately 7.5 million ha). It contains 204 gazetted forest reserves spread over vegetation zones ranging from wet evergreen to dry semi-deciduous forests (Hall and Swaine 1976).
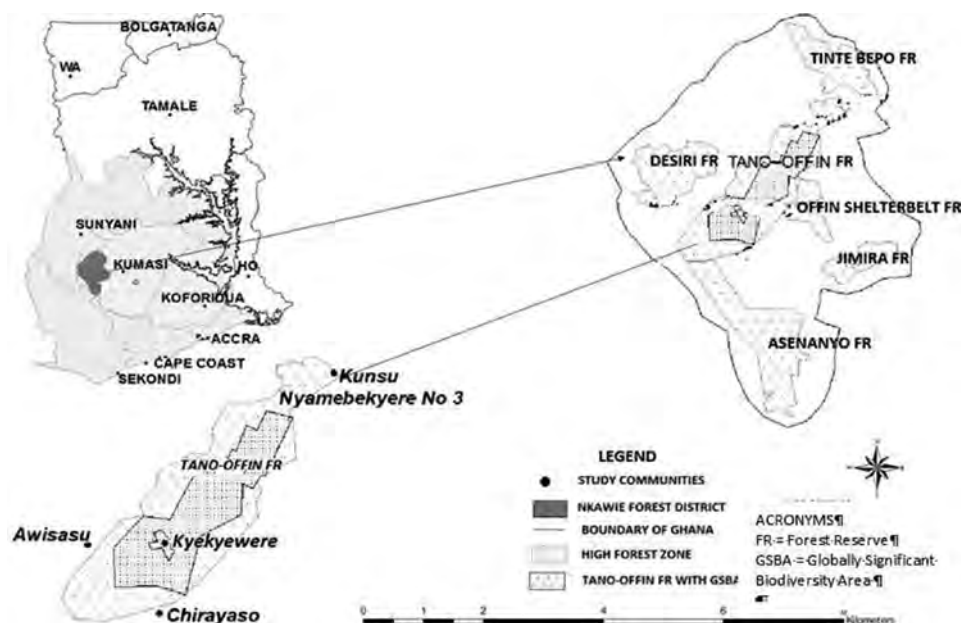
Figure 1. Study area (from Derkyi 2012).

The forest reserves comprise production, plantations, and protection forests. In production forests the exploitation of timber and NTFPs is allowed with the permission of the FC. Forest plantations are established in degraded areas assigned to that end mainly for wood production. Protected forests are exempted from timber exploitation and encompass fragile ecosystems like hill and swamp sanctuaries and areas of special biological and cultural interest (Hawthorne and Abu-Juam 1995). Areas outside forest reserves are referred to as off-reserve areas. Forest fringe communities are made up of a mixture of migrant settlers from other regions of Ghana and autochthonous population.

Methodology

Data Collection

This study employed a phased methodology aimed at achieving a shared conflict and solution analysis among forest professionals. This initial focus was justified with a view to generating consensus among those who bear primary responsibility for forest governance. The first stage involved a literature review, policy analysis, and informal interviews with key persons in the forest sector to identify relevant conflict issues. Next, self-completed semistructured questionnaires were administered between March and June 2009 among 30 policymakers and resource managers, including officials from the MLNR and FC (headquarters, FSD at regional and district level, and RMSC). Eleven respondents returned the questionnaire, including forest guards, technical officers, district managers, and regional managers. To increase the number and representativeness of actors especially from the MLNR and FC headquarters, the third step entailed additional face-to-face interviews with deliberately selected

respondents, using the same questionnaire. This increased the number of respondents to $n = 15$. The items in the questionnaire related to actors' understanding of the term *forest conflict* and the six conflict dimensions distinguished in the theoretical framework.

In order to compensate for the low response rate and to ensure triangulation, the fourth step involved a workshop in Kumasi in February 2010 at which the results of the survey were presented and a focus-group discussion was held to validate and synthesize the findings. The 25 workshop participants included forest professionals affiliated to Ghanaian and international research institutions such as Kwame Nkrumah University of Science and Technology (KNUST), the Forestry Research Institute of Ghana (FORIG), Tropenbos International (TBI) Ghana, and the International Network for Bamboo and Rattan (INBAR). Participants used the opportunity to develop a stepwise conflict management model (Figure 2) to address three core conflict types prevalent in Ghana's forest estate.

To assess the validity of the forest professionals' conflict analysis and conflict management model, this article compares their views with those of other major forest stakeholder groups by drawing from data collected among timber operators and local farmers and community-based organizations between 2008 and 2010 in the Tano-Offin Forest Reserve (Ashanti Region).[6] A focus-group discussion was held in November 2008 with four of the seven timber operators active in this area on forest conflicts they encounter during their operations and the various ways of overcoming them. Data on community perceptions of forest conflict dimensions were collected through a survey among 331 randomly selected inhabitants of villages representative of the various management regimes. These include Chirayaso ($n = 103$) and Kunsu-Nyamebekyere No. 3 ($n = 109$), both of which present a production and plantation management regime. The latter occurs under the modified taungya system (MTS), which is a co-management arrangement between the FC and communities in which farmers are allowed to plant food crops between the tree seedlings until canopy closure and share in timber benefits when trees are harvested (Ros-Tonen et al. 2013). Kyekyewere ($n = 119$), located in the middle of the reserve, represents a protection regime. Data were also gathered in an off-reserve village, but excluded from the analysis in this article as no conflicts were reported. In February 2010 meetings were organized in all study villages to validate the findings on community perceptions of forest conflicts. In June 2012 additional interviews were held with representatives of the Domestic Lumber Trade Association (DOLTA) and three NGOs that are active in the study area. These were New Generation Concern, the Sunyani Forest Forum, and the Rural Development and Youth Association (RUDEYA). All these are members of Forest Watch Ghana, which is a coalition of 23 NGOs campaigning for sustainable and just forest management and biodiversity conservation. The interviews centered on the aforementioned six dimensions of forest conflicts and on ways of improving conflict management strategies.

Data Analysis

The survey and interview data were coded and analyzed using Statistical Package for Social Sciences. MS Excel was used for a descriptive analysis of the views of respondents. Both analyses focused on the abovementioned six conflict dimensions. Three variables—antecedent conditions, manifest behavior, and consequences—were used to represent latent, manifest, and aftermath conflict stages, respectively (Pondy 1967; Engel and Korf 2005) (provided in Tables 1 and 2). Outputs of the

workshop with forest professionals, the focus-group discussion with timber opera-
tors, the validation meetings in the villages, and the interviews with NGO represen-
tatives were content analyzed to extract the views of the respective actors. The
conflict management strategies mentioned by the respondents were categorized using
Engel and Korf's (2005) version of Moore's conflict management continuum (see
Table 3). Document analysis (literature, policy documents, laws, meeting minutes,
etc.) provided secondary data and contextual information on forest conflicts.

Results

Perceptions of Forest and Tree Conflicts

Forest Officials
A shared definition of conflicts adopted at the workshop was ''perceived or actual
opposing or competing needs, values and interests between two or more parties
related to the allocation, access, ownership or utilization of a resource.''

Conflicts were classified according to their context. Conflicts in *on-reserve
forests* evolve around (1) illegality issues, (2) the allocation and use of forestland
for plantation development under the MTS, and (3) competing land uses (e.g.,
conservation vs. productive uses and forestry vs. farming or mining). The main
actors on the enforcement side are FSD field staff sometimes assisted by the Ghana
police and the military on patrol duties. Their major opponents are chainsaw millers
(those engaged in the legally prohibited on-site conversion of logs into sawn wood
for commercial purposes using chainsaws) (Marfo 2010) and illegal loggers (those
who remove trees without a Timber Utilization Contract or Timber Utilization
Permit), farmers (taungya farmers, illegal farmers, and those expanding admitted
farms illegally), hunters, and people extracting NTFPs for the market without
permits. Conflicts over the allocation of MTS plots evolve mainly between taungya
leaders and other participants. Conflicts on competing land uses involve farmers
among themselves (boundary conflicts) or versus timber operators (both legal and
illegal) and Fulani herdsmen (about crop damage). Competing claims also result
from the incompatibility between biodiversity conservation in strictly protected
''Globally Significant Biodiversity Areas'' and resource use, potentially creating
conflicts between the FC and inhabitants of protected areas, NTFP traders, farmers,
and miners (Derkyi et al. 2013). Conflicts in *off-reserve areas* include those between
(1) timber operators and farmers about inadequate compensation for crops damaged
during logging, (2) the FSD and tree-growing farmers about administrative lapses in
obtaining permits to harvest trees planted on-farm, (3) farmers/timber operators and
the FSD about the felling of nurtured trees on farms, and (4) farmers and pastoral-
ists about compensation for crop destruction by grazing animals. Conflicts in both
on-reserve and off-reserve areas include those between timber operators and
communities or between community elites and other community members over the
SRA, or concern timber operators in conflict with the FC about illegal operations,
with farmers about crop damage, or with chainsaw millers about competing claims
on timber. Forest professionals' views of antecedent conditions, manifest behavior,
and consequences of these conflicts are presented in Table 1.

Timber Operators
Timber operators mentioned negotiations about the SRA and compensation for
destroying farm produce during logging as the main conflict issues. They identified

Table 1. Forest professionals' perspectives of antecedent conditions, manifest behavior, and consequences of forest- and tree-related conflicts

Conflict type	Antecedent conditions	Manifest behavior	Consequences
Chainsaw milling and illegal logging in forest reserves	• Financial greed • Inadequate FC front-line staff and logistics • Lack of political will to enforce forest laws and stringent rules	• Logging without permit • Chainsaw milling • Rent seeking by officials	• Excessive exploitation of timber • Hostility between FSD officials and illegal loggers/ chainsaw millers
Illegal logging in off-reserve areas	• Absence of a timber benefit-sharing arrangement for farmers who nurture timber trees on farmlands	• Irritation among farmers about lack of benefits resulting in destruction of seedlings • Deals with chainsaw millers to fell trees on farmland	• Unsustainable and inefficient timber exploitation
Competing claims on timber	• Greed	• Timber theft	• Clashes among (legal and illegal) timber operators
Harvesting planted trees on farmland	• Bureaucratic procedures for harvesting and selling permits	• Farmers fail to adhere to the procedures	• Conflict between farmers and FSD officers
Crop damage compensation	• Absence of guidelines on crop damage compensation • Limited pasture land for animal grazing	• Crop destruction by loggers and animals of Fulani herdsmen • Inadequate compensation payment for farmers	• Tensions between farmers and timber operators/ Fulani herdsmen
SRA negotiation	• Absence of FC officials in SRA negotiations	• Hijack of the SRA negotiation process by community elites • Refusal of timber operators to pay	• Injustice and social conflict

(*Continued*)

Table 1. Continued

Conflict type	Antecedent conditions	Manifest behavior	Consequences
Forest encroachment	• Population increase • Farm land scarcity • Poor fertility of farmlands	• Illegal farming and extension of admitted farms in forest reserves	• Forest degradation
Boundary conflicts	• Unclear or distorted boundary markers • Greed and selfishness	• Encroachment of forest reserve or land of neighbours	• Mistrust and misunderstanding among farmers
Allocation and use of MTS plots	• Farm land scarcity • Greed • Inadequate supervision by FSD of MTS plot allocation	• Disproportionate allocation of farm plots by taungya leaders	• Tensions between taungya leaders and other MTS farmers
NTFP extraction	• Livelihood needs	• Illegal commercial NTFP extraction from forest reserves	• Hostility between FSD staff and extractors

Note. FC = Forestry Commission; FSD = Forest Services Division; MTS = modified taungya system; NTFP = nontimber forest product; SRA = Social Responsibility Agreement.

the failure of the FC to inform communities properly about these issues as the main cause, together with low pricing of logs by saw millers and tree theft by chainsaw operators. Saw millers control log prices, as they have more secure access to timber resources thanks to larger concession areas and more security about renewal of their timber utilization contracts (TUCs) after 5 years. Price negotiations cause delays in timber operations and extend the period during which wages and rent for equipment are to be paid and hence reduce the profit margins for timber operators. Timber theft occurs because farmers make deals with illegal chainsaw operators to fell trees on the lands given to contractors. As Ghanaian laws do not provide for benefit sharing by farmers in the exploitation of naturally regenerated trees on their land, such deals enable them to earn from the trees on their farmland.

Communities
Respondents ($n = 331$) from the three villages focus on conflicts over access to forest resources related to chainsaw milling ($n = 175$; 53%), boundary conflicts ($n = 115$; 35%), the allocation of plots for plantation development under the MTS ($n = 78$; 24%), illegal extension of admitted farms ($n = 58$; 18%), other forms of illegal farming in forest reserves ($n = 21$; 6%), NTFP extraction for commercial use without

a permit ($n = 52$; 16%) and for domestic use ($n = 11$; 3%), hunting ($n = 21$; 6%), SRA negotiations ($n = 15$; 5%), and crop damage compensation ($n = 7$; 2%). Chainsaw milling conflicts arise because the legal ban on chainsaw milling, which has applied since 1998, results in clashes with FSD field staff or FSD/military task force (56%) and operators holding legal timber utilization contracts (15%). Chainsaw milling conflicts occur among chainsaw millers themselves, who accuse each other of timber and fuel theft (23%). Only 5% mentioned the involvement of local actors (farmers) in chainsaw conflicts. Conflicts mainly involving local actors are those about farm boundaries and MTS plot allocation (favoritism among taungya leaders and fees charged). Conflicts about commercial NTFP extraction occur between forest guards and NTFP collectors (traders and community members employed by them). Conflicts regarding NTFP collection for domestic use rarely occur, but if they do they result from forest guards requiring community members to seek their permission before entering the reserve, despite legal provisions that allow NTFP extraction for domestic use without a permit. Hunting conflicts involving hunters and forest guards mostly occur during the closed season (August–December) when hunting is prohibited.

The community perspectives of antecedent conditions, manifest behavior and consequences of these conflicts are presented in Table 2.

Nongovernmental Organizations

All NGO representatives mentioned negotiations about SRA and crop damage compensation as the main sources of conflicts at community level, either between local people and their leaders or between the community and timber operators. They attribute the problem to leaders hijacking community benefits, unwillingness among timber operators to compensate farmers adequately for logging damage, ignorance about the arrangement at community level, and a lack of transparency and community involvement in the issuance of logging permits, which makes local people suspicious of timber contractor's operations. Conflicts relating to plantation development (about wages to be paid by commercial plantation developers or uncertainty about MTS plot allocation) and FSD field officers not respecting communal rights to extract NTFPs for domestic use were also mentioned. Some NGO representatives regarded the passive involvement of local people in policy formulation as an underlying problem. They are only involved when their consent is needed and therefore ill-informed or caught by surprise when new policies and regulations are imposed on them.

Perceptions of Conflict Management Strategies and Challenges

Forest Officials

Table 3 presents conflict management strategies mentioned by the respondents, categorizing them on the basis of the adapted version of Moore's (2003) continuum of conflict management approaches.

The respondents see several challenges to these approaches. First, the coercion in the administrative system has resulted in hostility between FSD officials and actors engaging in forest offenses, apathy among the stakeholders regarding support for forest management, or fighting and injuries. Second, contrary to the SRA guidelines, the District Forest Manager or his/her representatives do not fulfill the roles of witness and mediator during negotiation processes. This often results in disagreements between the community and the timber contractor or within the community, which may escalate into road blockades if not resolved on time. A third challenge

Table 2. Community perspectives of antecedent conditions, manifest behavior, and consequences of forest- and tree-related conflicts

Conflict type	Antecedent conditions	Manifest behavior	Consequences
Chainsaw milling	• Economic hardship due to poverty and insufficient job opportunities • Forest law forbidding chainsaw milling • Greed • Corruption • Jealously	• Noncompliance with the rules; logging without permit • Stealing of logs or fuel for operating the chainsaw • Escape of offenders • Bribing • Betrayal to FSD officials, military, or police	• Confiscation of chainsaw and lumber with or without arrest of offender(s), fining, or imprisonment • Injuries and occasional death • Mistrust and fighting among chainsaw millers
Admitted farming	• Land scarcity because of population increase	• Expansion of admitted farms into forest reserves	• Destruction of farms by officials
Illegal farming	• Land scarcity • Economic hardship	• Forest encroachment • Boundary conflicts	• Destruction of farms by officials • Hatred between neighbors
Allocation and use of MTS plots	• Greed • Power imbalances	• Disproportionate allocation of MTS plots by MTS leaders	• Demonstration by aggrieved farmers
Commercial plant NTFPs	• Bureaucracy and long distance to obtain permit from the FSD District Office • Economic hardship	• Stealing among collectors • Quarrels with forestry authorities over restrictions	• Confiscation of forest products and occasionally the arrest of collectors
Plant NTFPs for domestic use	• Need for food, tools and medicinal plants	• Accessing resources without permission of forest guard	• Confiscation of products
Hunting	• Need for food and income	• Hunting during closed season and for endangered species • Stealing of game traps	• Arrest and confiscation of meat and payment of fines • Hatred among hunters

*Note.* FSD = Forest Services Division; MTS = modified taungya system; NTFPs = nontimber forest products.

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Table 3. Conflict management strategies in Ghana

Category according to Moore (2003)	Conflict type in which it prevails	Example
Conflict avoidance	Chainsaw milling	Chainsaw millers escape, leaving behind the lumber and their working tools, upon hearing of the presence of the FSD/military patrol team in the area.
Negotiation	SRA negotiations	Timber contractor negotiates with beneficiary communities about SRA.
Mediation	SRA negotiations	A District FSD officer, representative of the local traditional authority, or District Assembly mediates if direct SRA negotiations fail.
Arbitration	Illegal farming and logging in forest reserves	Committees of inquiry are established to assess illegality cases in forest reserves and present recommendations for action.
Adjudication	Legal and illegal logging	Offenders sign affidavits in which they pledge to desist from committing such offenses again and pay fines for the stolen forest products through administrative means. However, some are sent to court to be fined and/or imprisoned.
Nonviolent coercive action	Chainsaw milling	The FSD/military/police team arrests illegal chainsaw operators and sends them for prosecution.
Violent coercive action	Illegal farming Chainsaw milling	The FSD/military/police team destroys illegal farms or uses force in clashes with chainsaw millers. Violence occurs among chainsaw millers in conflicts over log stealing.

Note. FSD = Forest Services Division; SRA = Social Responsibility Agreement.

involves interference by politicians and elites during conflict resolution. Sometimes these elites plead on behalf of the offenders, thereby preventing them from receiving the necessary punishment. A final challenge is how to arrive at trade-offs that are acceptable to all conflict parties involved.

The workshop participants proposed an integrated conflict management model to deal with compensation and land-use-related conflicts, forest boundary conflicts (including those over MTS plot allocation), and conflicts about illegal logging or chainsaw milling (Figure 2). In the proposed model, the FC—which maintains close links with traditional authorities—is the mediating actor that defines the steps that can be taken to achieve a win-win outcome. Except for illegal logging, this begins with negotiation among conflict parties, followed by third-party mediation (by
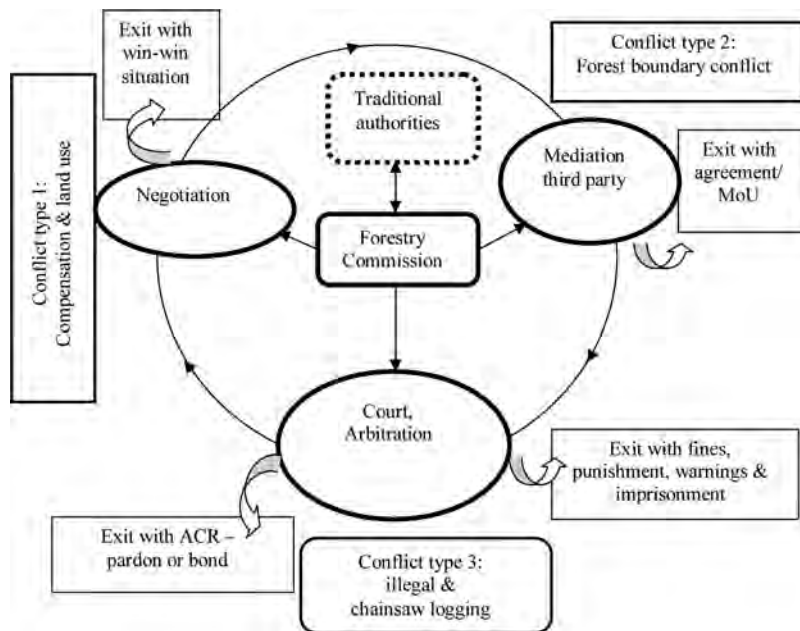
Figure 2. Integrated conflict management system (ICM) model designed by forest professionals (from workshop held in Kumasi, Ghana, February 2010). *Note.* ACR = alternative conflict resolution; MoU = memorandum of understanding.

FSD officials, traditional leaders, and/or a District Chief Executive) if this does not lead to a resolution. If mediation fails, arbitration is the next step. In that case a third party (e.g., the Land Valuation Division under the Lands Commission in the event of conflicts over logging damage, or an arbitration team with representatives from each conflict party in MTS plot allocation conflicts) decides how the conflict should be settled. If these approaches fail, legal proceedings are the final step. Illegal logging or chainsaw milling conflicts should be settled in court, but arbitration could be used through administrative means by the FSD or through a pardon with bond[7] if the timber is intended for community development. Such a stepwise approach worked for a conflict between farmers and MTS executives in Chirayaso about the disproportionate allocation of plots to taungya leaders. Mediation had failed, but all parties accepted the decisions by a field verification team consisting of representatives of the conflict parties, the district FSD, and traditional authorities. The taungya committee was replaced, additional land for plantation development was allocated to the aggrieved parties, and a new rule was created entitling MTS executives to four plots instead of one because of their extra responsibilities (Derkyi 2012).

Timber Operators
Timber operators designated negotiation as the first means of dealing with conflicts about SRAs and crop damage compensation, although sometimes mediation is required by District Chief Executives, the FSD, and an opinion leader in the community. Log pricing is best negotiated with prospective buyers before logging, but since the logging process takes a long time, buyers often change the agreed price. Coercive action (arrest by the FSD/military task force or the police) was indicated as the only means of dealing with tree theft by chainsaw operators, although feasible

only if the person is actually apprehended during the operation. The timber operators propose a more proactive role in conflict management for government agencies (FC, District Chief Executives, the Ministry of Food and Agriculture, and the MLNR). This includes educating both timber operators and local communities on relevant forestry issues and the SRA, training farmers to grow trees on the farmland boundaries rather than intermixing them with crops, and mediating in negotiations between saw millers and timber contractors on the issue of log pricing.

Communities

Villagers mentioned negotiation, with or without mediation by chiefs and elders, as the lead strategy for resolving conflicts on chainsaw milling, access to NTFPs for domestic use, and hunting. Mediation by chiefs and elders also plays a role in conflicts related to NTFP collection for commercial purposes, the allocation of MTS plots, boundary conflicts, the theft of logs or fuel among chainsaw millers, and disputes between hunters. Coercive action (the use of force) was reported for all conflict types except those relating to the collection of NTFPs for domestic use. Adjudication (arrest and fining of offenders, prosecuting them in law court and confiscating their products) was mentioned mainly in relation to chainsaw milling. Avoidance was said to be employed in all the conflict types except those relating to NTFPs for domestic use.

At the community validation meetings, consensus was reached about the roles in conflict management for actors at local and district levels:

- The FSD: awareness raising about forest issues, illegal operations and SRAs; law enforcement; monitoring the implementation of the MTS; forest boundary clearing.
- Chiefs and elders: advisory, educating, mediating, and monitoring roles.
- District Assembly (local arm of government): education and mediation in SRA negotiations.
- Community-based institutions (Unit Committees and Community Biodiversity Advisory Groups [CBAGs])[8]: collaborating with the FC and traditional authorities in natural resource management, patrolling, education, advice, and conflict settlement.
- Police and military: law enforcement.

Community members stressed the importance of avoiding bribery and favoritism in law enforcement and settling disputes and preventing the prolongation of court cases, which discourages people from sending cases to court.

Nongovernmental Organizations

NGO representatives stressed that most community-level conflicts involving outside actors do not end up in court, due to the frequent adjournment of court hearings, financial constraints, weak capacity to articulate the grievances, and favoritism toward timber operators. Court decisions favorable to communities are often circumvented due to elite interference. Notably, RUDEYA and the Sunyani Forestry Forum therefore focus on establishing community forums to empower people and to make them aware of policies and their rights, and organize workshops for timber operators and saw millers to raise awareness of their responsibilities toward the communities. They recommend that the FC improve information flows and raise awareness at community level, promote active community involvement in natural resource management, make

inhabitants' representation obligatory when timber operators and traditional leaders sign SRAs, improve coordination with environmental NGOs, and support the concept of community forums.

Discussion

The preceding analysis shows that forest conflicts in Ghana involve all forest- and tree-based livelihoods and are rooted partly in colonial legacy. Conflicting interests can be material and immaterial, for example, conservation aims versus livelihoods needs (Adams et al. 2003; Ros-Tonen and Dietz 2005).

In line with the literature, all the actor groups acknowledge chainsaw milling as the main source of forest conflicts. Remarkably, SRA negotiations and crop damage compensation payments that rank high in literature and among most actor groups are mentioned by only 5% and 2% of the community survey respondents. Underreporting of such conflicts may occur because community claims are not adequately dealt with or because judgments are easily circumvented due to elite interference. However, as no such conflicts were identified in the off-reserve site that was excluded from the analysis in this article, SRA and compensation payment conflicts indeed seem to be less prevalent in the study area compared to other regions. Access to farmland and commercial extraction of NTFPs are greater concerns at community level, resulting in conflicts with FSD officials, other farmers, and MTS executives.

The antecedent conditions in Tables 1 and 2 relate to conflict literature in different ways. Forest professionals are biased toward the violation of forest laws and refer primarily to factors identified by Tyler (1999) as important sources of natural resource conflicts, namely, lapses in public policy and institutional failures, lack of political will, deficient financial means, and elite pressure. A second group of factors relates to Homer-Dixon's (1994) environmental scarcity concept: the combined outcome of population growth, the resulting pressure on natural resources and farming land, environmental change (deforestation), and unequal social distribution of resources. Finally, some antecedent conditions refer to Schmidt and Kochan's (1972) "perceived goal incompatibility" and the "perceived opportunity for interfering with the attainment of one another's goals." In contrast, community members refer primarily to economic hardship and their need for food, tools, medicinal plants, and income, which compete with the needs and greed of others and laws that limit their access to forest resources. This basically relates to Schmidt and Kochan's "perceived goal incompatibility" combined with Homer-Dixon's environmental scarcity as underlying conflict causes. Community livelihood needs feature marginally in the conflict analysis by forest officials, whereas NGO and timber sector representatives relate them primarily to SRA and compensation payments but not, or much less, to farming land and NTFPs.

All conflict management strategies from Moore's (2003) conflict management continuum are currently being applied in Ghana's high forest zone, but they are poorly institutionalized. Conflict management operates within the national legal system, the collaborative system, and the customary system (cf. Engel and Korf 2005). It is often assumed that the latter does not play a functional role in Ghana's forest sector, as legislation has turned traditional authorities into passive and marginalized recipients of insignificant and irregular shares of revenue, with no formal decision-making roles in any aspect of forest and conflict management despite their legal position as resource owners (Mayers and Kotey 1996). However, the findings

revealed that customary institutions play a greater role in forest conflict management at local level than generally acknowledged.

The overall preference for win–win outcomes based on negotiation and mediation implies an important role for third-party mediation. The workshop participants proposed a conflict management model based on collaboration between the FC and traditional authorities. However, NGOs believe they can fulfill an important role in empowering communities and lobbying for the effective handling of community claims in court, based on their perception that chainsaw milling, SRA, and crop damage compensation are the major conflict issues. However, none of the other stakeholders explicitly mentioned a role for NGOs in conflict management. Timber operators refer exclusively to statutory government agencies (the FC, District Chief Executives, ministries) in informing stakeholders about SRA regulations and forestry issues, promoting tree-planting practices that minimize logging damage, and mediation in wood pricing. Community members assign an important role to the FC, but also stress the importance of collaboration with traditional authorities and community-based institutions. The central role assigned by most stakeholders to the FC as a mediator can be explained by the prevalence of hierarchical governance in Ghana (Derkyi 2012), resulting in a dependent relationship with government agencies (Insaidoo et al. 2012). As hierarchical relationships also prevail in customary governance, there is a role to be played by the FC or NGOs as watchdogs of interests of community members in SRA negotiations and MTS plot allocation: processes that are sometimes hijacked by chiefs and MTS executives, respectively. Moreover, all actor groups emphasize "education" (awareness raising and improving information flows) as important means of conflict prevention, with a role for the FC, traditional authorities, District Assemblies, and community-based organizations.

Conclusions

By addressing the question of what the perspectives are of various stakeholder groups of forest and tree-related conflicts in Ghana, this article has shown that conflicts are not only related to timber logging and chainsaw milling, as existing literature suggests, but that they are inherent in all forest- and tree-based livelihoods. The forest professionals involved in this study developed an integrated conflict management model based on a shared analysis of problems and potential solutions. This stepwise conflict resolution approach involves close links between statutory and customary institutions, prioritizes negotiation, and considers legal proceedings the last resort. At first sight, a phased methodology that combined a survey and interviews with a workshop to discuss and create consensus on the findings with those responsible for forest governance seemed to be appropriate. It generated a comprehensive analysis of prevailing conflicts and conflict management strategies, with good insights into the motivations and frustrations of various stakeholders. However, including the perspectives of other stakeholder groups revealed a bias toward conflicts resulting from violations of forest laws and a downplaying of livelihood needs at community level. The perspectives of other stakeholder groups generated a deeper insight into specific conflict issues and the drivers behind them. For the conflict management model designed by the workshop participants to function in practice, it is therefore recommended that other stakeholders' suggestions be included and that (1) the model be expanded to include preventive measures such as education and awareness

raising among stakeholders by the FC, traditional authorities, District Assemblies, and NGOs particularly concerning chainsaw milling, illegal logging, SRA negotiations, and NTFP extraction, (2) a role is assigned to forestry forums that provide a channel for various stakeholders to voice their grievances, (3) it is made explicit how community-based organizations can be involved in policymaking and implementation, monitoring, and conflict management, and (4) the role for NGOs as watchdogs of community interests against elite capture of benefits be institutionalized. A more elaborated model, which is acceptable to all stakeholders involved, could then be integrated into ongoing efforts to improve forest governance in Ghana such as the Natural Resources Environment and Governance Programme (NREG), the Voluntary Partnership Agreement (VPA) with the European Union (EU) to combat illegal logging, and Reducing Emissions from Deforestation and Degradation (REDD+) initiatives. Only then can conflicts in the forest sector be effectively addressed.

Acknowledgments

Notes

1. In this article the term "forest professionals" refers to knowledgeable people with experience in the forest sector, for example, researchers, consultants, retired government officials, or staff of nongovernmental and international organizations.
2. Engel and Korf (2005) reduced the number of categories on Moore's continuum by incorporating informal discussion, administrative decisions, and judicial and legislative decisions into negotiation, arbitration, and adjudication, respectively.
3. A stool (or in Northern Ghana: skin) is defined as any traditional authority (a chief or traditional council) having control over community land, including family land, as a representative of a particular community (Kasanga 2003, 144). With the consent of the traditional authorities, stool lands were released to be constituted as forest reserves under the jurisdiction of the Forestry Commission (Ollenu 1962; Derkyi 2012).
4. The Forestry Commission was established in 1999 by Act 571.
5. The SRA is a legally required payment by timber operators to the community of 5% of the stumpage fees in cash or kind.
6. Due to their nomadic nature and sporadic presence in the study area, Fulani herders were not included in the research.
7. Pardon with bond means that a community has to sign an affidavit not to fell trees for timber without a permit from the FSD.
8. Unit Committees are elective bodies in Ghana's local government system whose tasks include the organization of communal labor, revenue raising, registration of births and deaths, and the implementation and monitoring of self-help projects. CBAGs were created by the FC with a view to engaging community members in forest resource management by acting as social fences in the protection of Globally Significant Biodiversity Areas.

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