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## Identifying peace pathways: how can forest conservation contribute to environmental peacebuilding?

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### ABSTRACT

A growing body of literature is analyzing the conflict implications of forest conservation measures, yet, aside from individual case studies, the potential of these programs to foster cooperation and peace remains underexplored. This review addresses this gap by analysing how forest conservation measures can contribute to environmental peacebuilding. Specifically, we aim to identify so-called "peace pathways" from different case studies in the existing literature. Drawing on Dresse et al.'s (2019) framework, these peace pathways consist of (1) initial conditions, (2) peace mechanisms and, (3) outcomes. The paper is based on a structured and comprehensive review of the scientific literature on cooperation and peacebuilding related to forest conservation. Based on this review, we select seven case studies that allow us to trace the pathways that connect forest conservation to cooperative outcomes and peacebuilding. We identify eight key peacebuilding approaches: (1) creating spaces for dialogue between community members and external actors; (2) strengthening the social capital of communities; (3) adopting traditional customs and norms; (4) promoting adaptive learning and deliberation; (5) involving communities in participatory action research; (6) initiating a collective choice arrangement system; (7) tackling uncertainty through knowledge sharing, and (8) including a neutral convenor to initiate dialogue processes.

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## 1. Introduction

Forest conservation has gained increasing importance over recent decades due to the diverse functions that forests fulfill in the Earth system (e.g. Reichstein & Carvalhais, 2019). Particular emphasis has been placed on forest conservation to mitigate carbon dioxide emissions through programmes such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation in developing countries) (UNFCCC, 2022). In addition to their function as carbon sinks, forests fulfill a series of other functions, such as sustaining the hydrological cycle by providing rain and groundwater recharge (Bruijnzeel, 2004; Reichstein & Carvalhais, 2019). Recently, the value of forests as biodiversity hotspots, as well as their economic and cultural value, have been highlighted in the ongoing discussion on "nature's contributions to people" (Díaz et al., 2018, p. 270). In 2021, more than 100 world leaders agreed at the COP26 climate summit to end and reverse deforestation by 2030 (Rannard & Gillett, 2022). While this is an important sign that shows the importance of forest conservation and restoration in mitigating climate change, a growing body of literature shows that forest conservation programmes such as REDD+ can aggravate and create conflict – for instance, when local communities lose access to forests and their resources (Alusiola et al., 2021; Da Rosa Conceição

et al., 2018; Scullion et al., 2014; Wilner, 2006). At the same time, we know little about how forest conservation can contribute to environmental peacebuilding, which is understood as a collective term for "efforts aimed at building more peaceful relations through environmental cooperation, natural resource management, climate change adaptation, and disaster risk reduction" (Ide, 2020, p. 1). Against this background, we address the following research question: *How can forest conservation measures contribute to environmental peacebuilding?* Answering this question will help us identify cooperative actions in forest conservation schemes and best practices to offer recommendations on how forest conservation can be designed to not only be conflict-sensitive but also to contribute to environmental peacebuilding.

The study is based on a structured and comprehensive review of the scientific literature that allowed us to select seven case studies to trace the pathways connecting forest conservation to peacebuilding. We analyze the case studies using three categories from a framework developed by Dresse et al. (2019): (1) initial conditions, (2) mechanisms, and (3) outcomes. The findings of our study shift the narrow focus on links between climate (mitigation) and conflict to environmental change and cooperation (see also Tirrell et al., 2021). Furthermore, our results and recommendations will not only

be useful to conflict-sensitive forest conservation measures in (post-) conflict or conflict-prone environments but, more generally, provide entry points for practitioners aiming to foster more cooperative and peaceful societies. In addition, the knowledge gained through this research will contribute to the assessment and revision of forest conservation planning and implementation and to redesigning the benefit-sharing agreements between central governments and local communities (Soliev et al., 2021; see also Kimengsi et al., 2022). Our results may also provide useful input for redesigning financial resources and technical assistance, fostering cooperation, dialogue, and confidence-building at all levels, and informing land tenure and land-use rights reforms that provide legal titles to local communities (Cotula & Mayers, 2009).

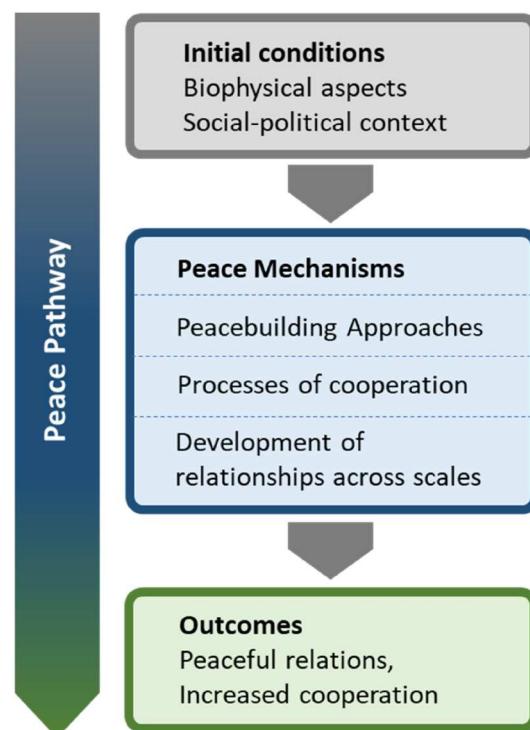
The paper is structured as follows: In Section 2, we describe our methods, including the concepts and analytical framework, as well as the case selection and its description. In Section 3, we present the results along the structure of our analytical framework before discussing the results and drawing the respective conclusions in Section 4.

## 2. Methods

### 2.1. Concept and framework

We understand the key concept of environmental peacebuilding as “a win-win strategy [...] that simultaneously addresses sustainability, peace and conflict” (Hardt and Scheffran (2019, p. 9) based on Matthew (2014) and Milante (2017)). In addition, we follow Krampe et al. (2021, p. 2), stressing the applicability of environmental peacebuilding “before, during or after conflict, emphasizing the potential for environmental governance [...] to support peace and stability.” Hence, we consider environmental peacebuilding to be relevant not only in (post-) conflict settings but also crucial for creating collaborative environments and cohesive societies through processes of cooperation, conflict prevention, and conflict mitigation. Ultimately, these processes contribute to creating positive peace, characterized by the “presence of cooperation, equity, equality and a culture of peace and dialogue” (Galtung & Fischer, 2013, p. 174). We understand conflict prevention as inherent to peacebuilding. This implies, that peacebuilding can take place, as it is also covered in the case studies below, without a direct link to an active conflict. We apply the analytical framework shown in Figure 1 to compare and analyze the selected case studies and to structure our analysis along the three core elements of environmental peacebuilding processes as proposed by Dresse et al. (2019): (1) initial conditions, (2) mechanisms and (3) outcomes. We refer to the sequence of these three elements as *peace pathways*.

*Initial conditions* that could trigger cooperative action comprise biophysical aspects and the social-political context. Biophysical aspects relate to the prevalent environmental conditions and existing or expected environmental challenges, including access to or unsustainable use of natural resources. The social-political context reflects the pre-existing relationships between (conflict) actors with a particular focus on mutual interests, shared values, and the level of power (a-)symmetry (Dresse et al., 2019). Since forest conservation projects



**Figure 1.** Analytical framework (Source: The authors based on Dresse et al. (2019)).

in emerging and developing countries are often initiated and/or funded by external actors, such as large donor organizations, their interests and roles are also taken into account during the analysis of initial conditions. Such an understanding of initial conditions, including actors and their perceptions and involvement within the environmental-peace nexus, is crucial for continuing with the analysis of peace mechanisms.

*Peace mechanisms* are the second core building block of environmental peacebuilding processes. In the second step of the analysis, we entangle the mechanisms, including key events and developments, that shape relationships during the implementation of forest conservation measures. To account for the very distinct abilities of the actors exercising power and participating in decision-making, we distinguish between mechanisms at different scales along intra-group, inter-group, and state-society relationships. As relationships between different actors evolve within the historical context and underlying knowledge and power dynamics, we add an analysis of agency as a foundational mechanism of action within existing and growing relationships. With this approach, we aim to strengthen the relational component of Dresse et al.’s (2019) framework by framing forest conservation measures as potential measures for strengthening relationships before, during, and after conflict. The focus on relationships has the advantage of shifting the focus towards collective action for common pooled resources while giving less importance to (often artificial) administrative boundaries, such as municipal/ district/ provincial boundaries, state borders, or more soft boundaries, such as management functions. While analyzing the peace mechanisms, we identify specific peacebuilding approaches that can be combined to shape a peacebuilding mechanism.

The *outcomes* of the peace mechanisms indicate the level of success of environmental peacebuilding approaches in forest conservation. We analyze and compare the effects of relationship (re-)formation throughout the implementation of forest conservation measures. After comparing the involvement of actors and the benefits gained through the respective measures, we revisit the initial conditions and evaluate how environmental conditions and challenges, as well as the social-political context, have been transformed towards more peaceful and sustainable environments and societies.

## 2.2. Case selection

Table 1 shows the criteria used to identify the seven case studies. Case studies 1 and 2 stem from the same paper but have been counted as two different case studies, as two different geographic locations and two different conflict settings are covered.

Initially, we aimed at a narrow analysis of REDD+ projects and peacebuilding. However, we could not find enough case studies that analyzed REDD+ in relation to cooperative instead of conflictive relations. Therefore, we extended our literature research to “forest conservation” in addition to “REDD+” and found 273 studies. Yet, most studies did either not cover cases in the Global South or did not provide enough detail to follow the pathway from forest conservation to peacebuilding. Most case studies we found covered the conflict in sufficient detail but were very limited in the description of the intervention or did not differentiate the initial conditions, the related detailed steps taken, and the respective outcomes. Therefore, our final selection includes only seven case studies published in six articles. Three of the selected case studies are located in Nepal and one each is in Thailand, Indonesia, Ghana, and Mexico. We are aware that this case selection is not geographically balanced. However, we preferred to keep our strict selection criteria to follow the peace pathways in detail and have the space to discuss and present each case study sufficiently (Table 2).

**Table 1.** Selection criteria for the case studies.

Thematic focus		Forest conservation (including REDD+) in the Global South	
Level of detail	Sufficient to retrace the pathways leading from forest conservation efforts to peacebuilding		
Method	Field research		
Type of publication	Peer-reviewed journal article		
Database	Web of Science, Scopus, Google Scholar		
Search terms	forest conservation REDD*	cooperation* peacebuilding* conflict mitigation conflict prevention* peace park*	
	AND		
Selected case studies	1 Southern and Central Nepal 2 Southern and Central Nepal 3 East, Midwest, and Southern Nepal 4 Northern Thailand 5 Central Ghana 6 Southern Mexico 7 Sumatra, Indonesia	Ojha et al. (2019) Ojha et al. (2019) McDougall and Banjade (2015) Hares (2009) Ros-Tonen and Derkyi (2018) Johnson and Nelson (2004) Ramdani and Purnomo (2022)	

## 2.3. Description of cases

### 2.3.1. Case studies 1 and 2 – Southern and Central Nepal

Ojha et al. (2019) examined conflict resolution over local water and forest management under the changing socio-economic contexts and climate change in southern and central Nepal. The study focused on two cases. Firstly, conflict arose in *Chisapani*, Terai, when forming a Community Forest User Group (CFUG) granted forest management rights to northern hill migrants, excluding over 2,000 Madhesi households from the southern plains. Labelled as “distant users,” the Madhesi community lost traditional access to 495 hectares of valuable Sal forest. This exclusion and restrictive forest policies led to illegal usage and heightened tensions between the groups, signaling deeper social and cultural divides and contributing to broader socio-political instability.

In the second case, conflict arose in the *Dipdole Etapu* CFUG, 25 km east of Kathmandu, due to rapid urbanization and in-migration, leading to competition for forest resources and water. Disputes over water access and distribution were complicated by ambiguities between the Forest Act of 1993 and the Water Resources Act of 1992. Leadership conflicts and the marginalization of 22 Dalit households heightened tensions. Illegal tree felling and unsustainable resource use further strained relations, especially between wealthier members and marginalized groups lacking resources for water infrastructure.

### 2.3.2. Case study 3 – East, Midwest, and Southern Nepal

McDougall and Banjade (2015) examined the changes in social capital and conflict-accompanied transition by Community Forestry User Groups (CFUGs) toward adaptive collaborative governance. Their study took place in districts across the east to mid-west and from the southern plains (Terai) to the mid-hills area of Nepal. Conflicts within CFUGs stemmed from tensions at local, meso, and national levels, particularly influenced by the Maoist insurgency. These conflicts, lasting for years, fell into three categories: power and decision-making access, rights and resource distribution regarding forest products and boundary disputes, and non-community forestry issues like disputes and ethnic rivalries.

### 2.3.3. Case study 4 – Northern Thailand

Hares (2009) investigates the local background of forest conflict resolution in the upland area of northern Thailand. The inhabitants, referred to as the hill tribes (chao khao), are various ethnic groups, with Hmong and Lewa being the largest minorities. Most of them are immigrants who lack citizenship. The government regards them as disloyal to the state; the destructive impact of their slash-and-burn farming practices on forests has been used by the government as a reason for resettling them away from protected forests.

### 2.3.4. Case study 5 – Central Ghana

Ros-Tonen and Derkyi (2018) assess the factors determining whether interactions over the timber resources of off-reserve forest areas cause conflict or cooperation in two communities of the Ashanti Region of Ghana. The local communities are customary landowners and the traditional authorities (chief

**Table 2.** Summary of initial conditions, conflict drivers, stakeholders, and peacebuilding approaches.

Case Study	Location	Forest Use	Stakeholders Involved	Conflict Drivers	Initiator of Peace Mechanism	Peacebuilding Approach
1	Southern and Central Nepal (Ojha et al., 2019)	– fuel wood, animal fodder – timber and non-timber forest products – water resources	– communities closer and further away from the forest	– restrictions over (full) access to land and forest resources	– research team – CFUG leadership	– promoting adaptive learning and deliberation – creating spaces for dialogue between community members and external actors – involving a neutral convenor
2	Southern and Central Nepal (Ojha et al., 2019)		– the better-off and the poor and marginalized communities	– restrictions over (full) access to water resources		–
3	East, Midwest, and Southern Nepal (McDougall & Banjade, 2015)	– wood for furniture – construction materials – firewood	– between CFUG members – CFUG members and the government – local, district, and national	– exclusion of community members from decision-making and access to power – unequal benefit-sharing arrangements – access restrictions to forest resources (though not the main driver)	– research team	– strengthening the social capital of communities – creating spaces for dialogue between community members and external actors – involving a neutral convenor
4	Northern Thailand (Hares, 2009)	– slash-and-burn farming	– lowland and upland communities	– restrictions over (full) access to land, water, and forest resources – vague land tenure, and lack of land tenure rights	– Hmong community taking advantage of a governmental development programme – Karen community	– adopting traditional customs and norms – creating spaces for dialogue between community members and external actors – tackling uncertainty through knowledge sharing – involving a neutral convenor
5	Central Ghana (Ros-Tonen & Derkyi, 2018)	– timber – agriculture, and plantation development, – cultivation of valuable sprouts and tree species on farmland	– legal timber operators and illegal chainsaw loggers – between timber operators and local communities – between illegal chainsaw loggers and public authorities	– vague land tenure and lack of land tenure rights – unequal benefit-sharing arrangements	– timber operators and traditional authorities	– creating spaces for dialogue between community members and external actors
6	Southern Mexico (Johnson & Nelson, 2004)	– wood for furniture – construction materials – firewood – tourism	– local community and the government	– vague land tenure and lack of land tenure rights	– community leaders and members	– adopting traditional customs and norms – initiating a collective choice arrangement system – creating spaces for dialogue between community members and external actors
7	Sumatra, Indonesia (Ramdani & Purnomo, 2022)	– oil palm plantation – timber	– local communities and a timber company	– restrictions over (full) access to land, water, and forest resources	– international and national research teams supported by the Indonesian Peatland Restoration Agency	– tackling uncertainty through knowledge sharing – involving a neutral convenor – creating spaces for dialogue between community members and external actors

and elders) act as custodians of land on behalf of the community. The chiefs give access to farming land, collect land rents, settle land-related disputes, and ensure harmony in the community. Individual farmers only own the trees they plant, which the government permits them to cut. Permits for logging are given to timber operators (TO) on application at government forest district offices.

### 2.3.5. Case study 6 – Southern Mexico

Johnson and Nelson (2004) assessed the role of a common property system in Lagunas de Montebello National Park (PNLM) in Chiapas, Mexico. The government created the park in 1959 but did not recognize the existing community boundaries. In retaliation to perceived infringement, the community declared its own and founded the Natural Ejidal Park

of Tziscao, a communal area within the national park. The Mexican constitution was then created, and plans were made for the relocation of landless people in 1997 following this communal area system called *ejido*. These land reforms were partially successful: Tziscao is officially not considered an *ejido* but refers to itself as one and further defines itself as an official communal entity.

### 2.3.6. Case study 7 – Sumatra, Indonesia

Ramdani and Purnomo (2022) analyze a conflict over peat water sharing in UNESCO's Giam Siak Bukit Batu (GSBB) biosphere conservation area in Sumatra, Indonesia, which is divided into three regions: the core zone, the buffer zone, and the transition zone. 90% of the area are tropical peatlands which experience increased peat fires due to drainage and disagreements over peat water sharing related to different economic activities from two actors in the region: a timber company, mostly active in the buffer zone, and communities practicing oil palm plantation in the transition zone.

## 3. Results

To analyze the peace pathways, we first outline the initial conditions before any activities were implemented (Section 3.1). Secondly, we analyze the peace mechanisms, including cooperation at different levels and between various stakeholders (Section 3.2), and identify respective peacebuilding approaches that shape the peace mechanisms. Lastly, we describe the outcome of the peace mechanisms (Section 3.3).

### 3.1. Initial conditions

In all six case studies, the forest resource served as a source of livelihood for the forest-dependent communities (Hares, 2009; Johnson & Nelson, 2004; McDougall & Banjade, 2015; Ojha et al., 2019; Ros-Tonen & Derkyi, 2018). These forest products and services included construction materials, fuel wood, medicinal plants, wild foods, water resources, and land for subsistence farming. CFUGs in case studies 1–3 utilized forest resources for fuel wood, animal fodder, timber and non-timber forest products, and water resources (McDougall & Banjade, 2015; Ojha et al., 2019). At the outset, the local communities in case study 4 practiced slash-and-burn farming but then farmed permanent fields with cash crops, which led to farmers clearing more fertile land in the forest for crops (Hares, 2009). Case study 5's off-reserve zones – forest patches, farm, and fallow land – are vital to its natural resources, offering livelihood options to timber operators and the local communities. Furthermore, providing timber, agriculture, and plantation development sites for cash and food crops, while some communities rear livestock for domestic and commercial purposes. Farmers manage the off-reserve timber resources by cultivating valuable sprouts and tree species on farmland and, if necessary, protecting timber trees from forest fires (Ros-Tonen & Derkyi, 2018). Tziscao, the indigenous community in Case study 6, is at the forest frontier and conducts subsistence farming, which puts some pressure on the forest resources. For them, the forest provides wood for furniture, construction materials, and firewood.

Moreover, it functions as a tourist attraction. Community members, therefore, rely on tourism for their revenue (Johnson & Nelson, 2004). Finally, in case study 7, the peatland of the community forestry area was utilized by villagers for oil palm plantation.

All local communities in the seven case studies experienced conflict over forest resources. Conflicts occurred at various levels, including the local level for all the case studies and at district and national scales for one case study. Multiple parties across different scales were engaged in the conflicts. The main conflict dynamics can be categorized into conflicts between local communities and the local government, conflicts between neighboring communities, conflicts between group leaderships, local, district or national governments, group members and the local community as well as conflicts between the local community members and timber operators (Hares, 2009; Johnson & Nelson, 2004; McDougall & Banjade, 2015; Ojha et al., 2019; Ramdani & Purnomo, 2022; Ros-Tonen & Derkyi, 2018). In case studies 1 and 2, conflict occurred between northern local communities living close to the forest and southern local communities that live away from the forest. Additionally, conflicts occurred between the better-off and the poorer, marginalized people in the community (Ojha et al., 2019). Case study 3 featured conflicts between members within the CFUG and between the CFUG and local, district, and national governments (McDougall & Banjade, 2015). In Case study 4, conflict was between lowland and upland communities (Hares, 2009). Similarly, in case study 5, the conflicts were between “legal timber operators and illegal chainsaw loggers, between timber operators and local communities, and between illegal chainsaw loggers and public authorities (Forestry Commission (FC), police, and the judiciary)” (Ros-Tonen & Derkyi, 2018, p. 8). Moreover, the conflict in case study 6 occurred between the local community and the government (Johnson & Nelson, 2004) and in case study 7, conflict arose between the local communities and the timber company.

Across the seven case studies, a diverse set of conflict drivers has been identified. Conflict drivers included restrictions over (full) access to and control of forest and water resources by either the government or other community members and unclear and unequal benefit-sharing arrangements between local community members. In addition, weak forest fire control, vague land tenure, lack of land tenure rights, and exclusion of community members from decision-making and access to power within CFUGs were identified as conflict drivers. In case studies 1, 2, 4, and 7, communities experienced conflict due to restrictions over (full) access to land, water, and forest resources (Hares, 2009; Ojha et al., 2019; Ramdani & Purnomo, 2022). In case studies 4–6, conflict was experienced due to vague land tenure and lack of land tenure rights (Hares, 2009; Johnson & Nelson, 2004; Ros-Tonen & Derkyi, 2018). Notably, case studies 3, 5, and 6 featured access restrictions to forest resources, though these were not the main drivers of conflict (Johnson & Nelson, 2004; McDougall & Banjade, 2015; Ros-Tonen & Derkyi, 2018). Unequal benefit-sharing arrangements were a conflict driver in case studies 3 and 5 (McDougall & Banjade, 2015; Ros-Tonen & Derkyi, 2018). Finally, the exclusion of community members from

decision-making and access to power within the CFUG was a conflict driver encountered in case study 3 (McDougall & Banjade, 2015).

### 3.2. Peace mechanisms

#### 3.2.1. Initiating actors and motivation

The peace mechanisms throughout the seven cases were initiated by either the local community members and their leadership or by 'outsiders' in the role of convenors, such as the government, timber operators, or research teams. In case studies 1–3 and 7, the research team initiated a project, acquired funding, and reached out to the local community and CFUG leadership (McDougall & Banjade, 2015; Ojha et al., 2019; Ramdani & Purnomo, 2022). In the fourth case study, the government targeted the Hmong community with development projects to resolve the so-called "hill tribe problem" (Hares, 2009, p. 384). This framing occurred because of the community's background as opium poppy growers, their migratory lifestyle and their tradition of shifting cultivation that was perceived as a threat to the forest. The major goal of these government programmes was to gain control over the Hmong and integrate them into mainstream society. The Hmong, however, took advantage of the programmes and initiated peacebuilding activities. Likewise, the Karen community demonstrated their technical ability in forest management through their willingness to share knowledge with other communities (Hares, 2009). In case study 5, Social Responsibility Agreements (SRAs) were negotiated between the timber operators and traditional authorities, while the farmers were not involved. All parties favoured peaceful cooperation at this stage because it was expected to guarantee good relationships between the timber operators and farmers during the tree harvesting process (Ros-Tonen & Derkyi, 2018). In Tziscao, in case study 6, the community leaders and members initiated the peacebuilding process. The community's mutual understanding of the forest's condition, the impact of their activities on the forest, and the importance of forest conservation through reforestation and control of forest fires led the community leaders and members to create clear land boundaries to minimize conflict (Johnson & Nelson, 2004).

#### 3.2.2. Cooperative and trust-building dynamics

Several measures to increase the degree of understanding and cooperation were undertaken by the local communities, either with the local, district, and national government or with research teams. In all case studies, except case study 5, community members were fully involved in the peacebuilding processes (Hares, 2009; Johnson & Nelson, 2004; McDougall & Banjade, 2015; Ojha et al., 2019; Ramdani & Purnomo, 2022). In case study 5, the community chiefs and leaders represented the community members in the negotiation meetings. The chiefs and leaders informed community members of the decisions made during communal meetings. The community members mostly acknowledged the decisions but were sometimes not in agreement. This led to their resistance, causing further conflict between the community and the government (Ros-Tonen & Derkyi, 2018). In case studies 1–3 and 7, the researchers formally initiated the peacebuilding process.

Meetings involved the conflicting parties and researchers setting ground with discussions on the peacebuilding process. Subsequent participative meetings were held to analyze the conflict's root cause. This was followed by training, developing a participatory guide on conflict assessment, and designing a peacebuilding programme. That included, for example, power decentralization through the creation of smaller action groups for conflict resolution. A baseline analysis of the forest resources was then undertaken and CFUG governance structures were re-evaluated. Finally, the CFUGs adopted the developed guidelines and plans. Similarly, the timber company took proactive measures by opening four canal gates along the concession boundary and providing their excavators to restore non-functional canals within the local community (McDougall & Banjade, 2015; Ojha et al., 2019; Ramdani & Purnomo, 2022). In case studies 4–6, informal peacebuilding processes were initiated by either the local communities, the local community leadership, or the government (Hares, 2009; Johnson & Nelson, 2004; Ros-Tonen & Derkyi, 2018). Communal structures already existed in the form of local chieftaincy. In case studies 5 and 6, conflict resolution was hierarchical, depending on the severity of the conflict. External authorities, including government officials, engaged in the conflict resolution process when the local community had not attained a resolution. For instance, officials from the district forest service division resolved conflicts between individual farmers and timber operators regarding compensation for crop damage through assessment of the conflict concerning the existing agreement (Johnson & Nelson, 2004; Ros-Tonen & Derkyi, 2018). Simultaneously, cultural and religious symbols were used in the process of peacebuilding in case studies 4 and 5. For example "in Mae Chaem, a tree ordination ceremony was started to protect the pine forest" to foster trust, understanding, and a connection to the forest and local traditions. Members of the local community and, at times, representatives from the government and timber operators participated in traditional ceremonies. In case study 5, a goat was sacrificed to the gods to seal negotiations and ensure peaceful logging (Ros-Tonen & Derkyi, 2018). Similarly, in case study 4, the forest was ordained through a Buddhist ceremony to sanctify it and thus protect it from illegal logging. Similar practices are described in a Teev Ntoo Xeeb ceremony, where spirits were invited to protect the forest and the village community (Hares, 2009).

Even though the processes of creating mutual trust and cooperative relations were informal, the structure differed between the three case studies. In case study 4, the community initiated the peacebuilding initiatives by collaborating with a local university and publishing a book. This led to an increased awareness among the authorities regarding the interconnected cultural elements. The community applied survival tactics – for example, planting fruit trees to protect the forest – to form and strengthen networks that could negotiate on behalf of the community with the government at the local, district, and regional levels. At the village level, rules were developed, traditional customs observed, and informal negotiations were undertaken through community members' participation in the village council. Customary officials approved the village rules to prevent and solve conflicts. The community elected

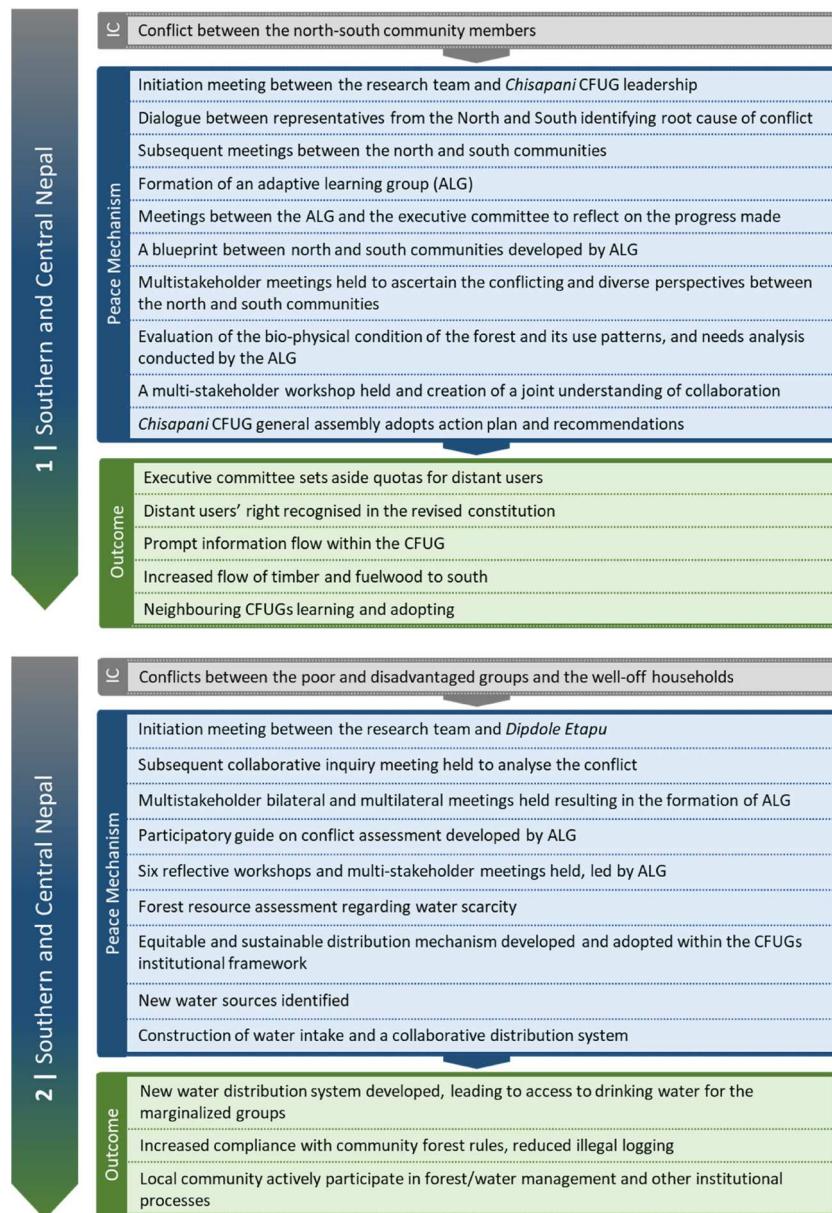
a committee to oversee case disputes. Furthermore, a community forest committee was formed to oversee the forest conservation plans (Hares, 2009). Likewise, in case study 4, the community was led through customary governing structures in the form of its traditional council. Chiefs and elders collaborated with the local community through the creation of rules and regulations and were the point of contact for the external stakeholders on behalf of the community. They ensured that the timber operators understood and respected traditional authorities, customs, and norms. Three levels of mediation existed within the community, depending on the conflicting parties and conflict intensity. At the first level, chiefs mediated whenever conflicts occurred between farmers and timber operators. Secondly, when agreements failed, the district Forest Services Division (FSD) mediated between individual farmers and timber contractors. Finally, FSD and the forestry commission mediated in SRA negotiations in the presence of witnesses (Ros-Tonen & Derkyi, 2018). The community in case study 6 is closely tied, with every community member fully involved in all communal activities through the *Asamblea*, a regular meeting of villagers. The community has developed measures to prevent conflict, including the participatory development of clear communal rules and regulations, clearly defined forest-use rights, forest access, and the creation of land boundaries respected by everyone. The conflict-resolution community leaders oversaw the peacebuilding process. Moreover, conflict resolution occurred at diverse levels and was handled by separate groups of people depending on its cause and severity. For example, the *Consejo de Vigilancia*, a supervisory board, resolved land disputes; non-compliance with its decisions led to a jail term. Senior community members assemble to resolve severe conflicts. Furthermore, through participation in the *Asamblea*, the community resolves conflicts that concern the entire community (Johnson & Nelson, 2004).

### 3.2.3. Approaches to peacebuilding

Eight approaches to peacebuilding were identified from the seven case studies. In most case studies, a combination of these peacebuilding approaches formed the backbone of the peace mechanisms: (1) creating spaces for dialogue between community members and external actors; (2) strengthening the social capital of communities; (3) adopting traditional customs and norms; (4) promoting adaptive learning and deliberation; (5) involving communities in participatory action research; (6) initiating a collective choice arrangement system, (7) tackling uncertainty through knowledge sharing, and (8) including a neutral convenor to initiate dialogue processes. Apart from these approaches to peacebuilding, we identified conflict prevention strategies that revealed some overlaps with the peace mechanisms. These included conflict avoidance – through (a) the frequent use of the term “peaceful cooperation” by the community members which served as a constant reminder, (b) reinforcing the importance of harmonious collaboration-, (c) strengthening social ties, (d) fostering youth employment, (e) and networking, as shown in Figure 2. It remains open whether such conflict avoidance strategies occur voluntarily or reflect underlying power imbalances that oppress controversial views.

### 3.2.4. Spaces for dialogue and negotiation of governance processes

All the case studies provided spaces for dialogue between community members and external actors, as discussed in more detail below (Section 3.2.1). Adaptive learning and deliberation is an approach that leads to conflict reduction and strengthening cooperation in governance processes by facilitating learning and discussion between stakeholders; it was used in case studies 1–3, in which participatory action research was also used (McDougall & Banjade, 2015; Ojha et al., 2019). Several CFUGs engaged in these processes. In these case studies, research teams initiated the process, resulting in several multi-stakeholder meetings and training events. For example, the research team, together with the community members and representatives from the local government forest departments, held 15 meetings over the course of two years (Ojha et al., 2019). Depending on the agenda, the meetings had different agendas and diverse groups of stakeholders, including CFUG members, distant users and district forest office and community leaders, executive committee members, and marginalized groups. Furthermore, CFUG governance documents – for example, blueprints, vision and mission statements, and indicators to monitor the groups’ progress – were developed, and existing ones were revised for conflict resolution. This development and revision were achieved through training sessions by the researchers followed by a set of reflective meetings. All the CFUG members, local communities, the marginalized, and representatives from local government forest departments were fully involved in the process. All participants reflected on the process for learning purposes workshops that allowed the stakeholders to review their previous experiences and develop step-by-step collaborative measures. Similarly, in case study 3, CFUG members elected new leadership members. Leadership and power were decentralized within the CFUGs. For example, leadership was shared between *toles* – smaller communal groups that included marginalized people in the community – the executive committee and action group leaders. The *toles* became the initial point for a bottom-up, self-monitoring process (McDougall & Banjade, 2015). To prevent further conflicts – for example, about water availability – the members identified new water sources and developed a construction for water intake and a collaborative distribution system (Ojha et al., 2019). In case study 7, the researchers organized Focus Group Discussions (FGDs) and a set of meetings involving villagers, village officers, timber company representatives, and local NGOs in both the village and the province. Additional meetings were also conducted at the national level, where the researchers, timber company, and Indonesian Peatland Restoration Agency representatives collaborated to find a mutually beneficial resolution to the conflict. Eventually, the timber company agreed to collaborate with all the stakeholders on sharing water from their concession area and restoring and constructing canal blocks in the village (Rambaldi & Purnomo, 2022). The adoption of traditional customs and informal negotiations within and between communities was described in case studies 4 and 6 (Hares, 2009; Johnson & Nelson, 2004). In both cases, the community established a robust local leadership and conflict resolution system. Clear rules and regulations had been set, and all members



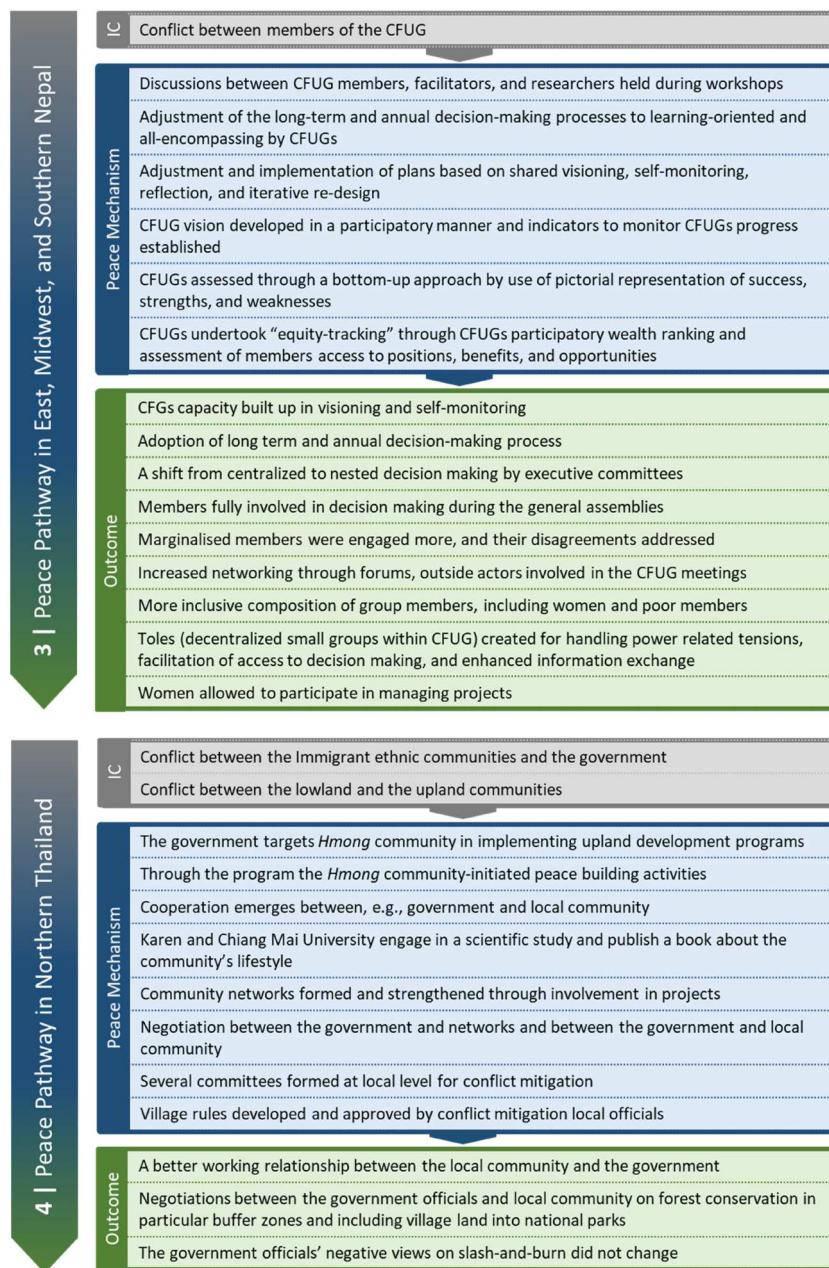
**Figure 2.** Peace Pathways. Acronyms used: Initial Conditions (IC); Community Forest User Group (CFUG); Adaptive Learning Group (ALG); Timber Operators (TO); Forest Services Division (FSD); Forestry Commission (FC); social responsibility agreement (SRA); United Nations Development Programme (UNDP); World Wildlife Fund (WWF); Tropical Peatland Society Project (TPSP); Japan International Cooperation Agency (JICA); Indonesian Peatland Restoration Agency (IPRA). (Source; The authors, based on Hares (2009), Johnson and Nelson (2004), McDougall & Banjade( 2015), Ojha et al. (2019), Ros-Tonen and Derkyi (2018), and Ramdani and Purnomo (2022)).

understood, respected, and observed them. Community members were also fully involved in the process. Mediation, negotiation, and reconciliation were applied based on local customs, norms and knowledge. At the center of the peace-building process are the community's traditional and elected conflict resolution leaders. In instances where the traditional leaders did not resolve conflict, governmental authorities took over the process.

In case study 5, social capital was strengthened as an approach to peacebuilding, relying on the strong community bonds that existed amongst the local community (Ros-Tonen & Derkyi, 2018). As in case studies 4 and 6, customary governing structures played a decisive role through the leadership of chiefs and community leaders (Hares, 2009; Johnson & Nelson, 2004). In case study 5, traditional norms, and customs

were implemented and authority respected. The community members were, however, not involved in initial negotiations; however, the local chief and leaders represented them while keeping them informed. Mediation through the local leaders was established for conflict mitigation. Forestry government officials at the district level were involved in the conflict resolution process when the conflicts were due to a misunderstanding of the formal agreements between farmers and timber operators. Social ties through the employment of the local youth by timber operators were valued in ensuring trust and conflict prevention. Conflict avoidance was also used as a peace-building strategy through the community commonly using the phrase "peaceful cooperation" (Ros-Tonen & Derkyi, 2018).

Notably, peacebuilding approaches and conflict prevention strategies were used interchangeably in three case studies.



**Figure 2** Continued

We found, that in case study 5, social capital was strengthened as an approach to peacebuilding, whereas in case studies 1 and 2, social capital was strengthened as a conflict-prevention strategy. All three implemented one peacebuilding approach; however, case study 4 used two conflict prevention strategies (Ojha et al., 2019; Ros-Tonen & Derkyi, 2018). A collective choice arrangement system was used in case study 6 through joint communal decision-making. This approach was combined with the adoption of traditional customs and informal negotiations within and between communities. Community members collectively made significant decisions on all aspects concerning their welfare in the community's *Asamblea* – for example, electing conflict resolution leaders and distributing roles in communal resources management. Every community member was fully involved in the process. Unresolved conflict at the community level was escalated to

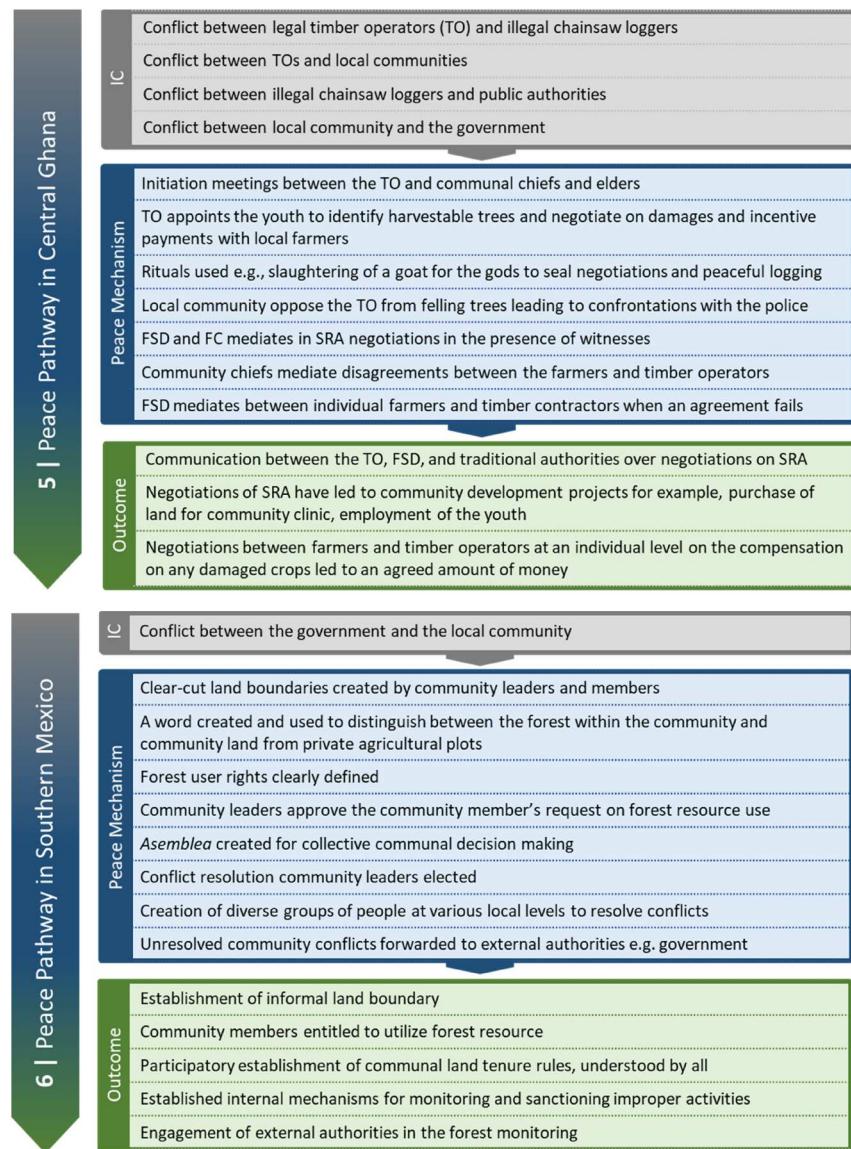
the local government authority for intervention (Johnson & Nelson, 2004).

### 3.3. Relations between stakeholders

In the peacebuilding process, the formation of diverse relationships and cooperation between stakeholders at various levels took place. These included intra-group and inter-group relations and society-community relations. This section discusses the relationships and cooperation formed during the peacebuilding process.

#### 3.3.1. Intra-group relations

In all seven case studies, intra-group relations facilitated the peacebuilding process (Hares, 2009; Johnson & Nelson, 2004; McDougall & Banjade, 2015; Ojha et al., 2019; Ramdani &

**Figure 2** *Continued*

Purnomo, 2022; Ros-Tonen & Derkyi, 2018). In case study 3, however, these collaborations facilitated the peacebuilding process and, at the same time, led to new conflicts amongst the CFUG members. Poor users and women became more knowledgeable about their rights and equity. They developed a greater stake in the CFUG which led them to demand more community forest rights and benefits. Unlike before the collaborations, more women engaged in the CFUG, and this was not received positively by some people, leading to confrontation. For example, during the construction of a culvert in a road, a man indignantly said, "It is because of *sikaimukhi* [adaptive collaborative approach] these women dared to challenge us" (McDougall & Banjade, 2015, p. 12).

In case study 5, youth were employed as tree hunters because of their cooperative influence in the community. They "identify harvestable timber trees and negotiating [sic.] compensation and incentive payments with the farmers" (Ros-Tonen & Derkyi, 2018, p. 6). Similarly, in case study 4, villages created networks that increased cooperation between ethnic groups and villages on forest conservation. These

networks could also serve as a conflict resolution mechanism because local people participated fully, gaining a sense of belonging and togetherness in avoiding conflicts. For example, religious networks engaged with the local community in a tree ordination ceremony to protect the pine forest. Moreover, the Karen community developed voluntary community action forest protection, further strengthening networks and cooperation with other local community members (Hares, 2009). In case study 3, collaboration increased within the CFUG and between it and the community. Through these collaborations, the CFUGs became more actively engaged in forest conservation measures by developing rotational "forest watcher" systems, employing forest guards, and enforcing rules and regulations (McDougall & Banjade, 2015, p. 8). Furthermore, case studies 1 and 2 demonstrated collaboration between the two communities in conflict and between water users and the executive committee. These collaborations resulted, for example, in the increased flow of timber and fuel-wood to the southern community, which was initially unable to access forest resources. This led to peaceful coexistence

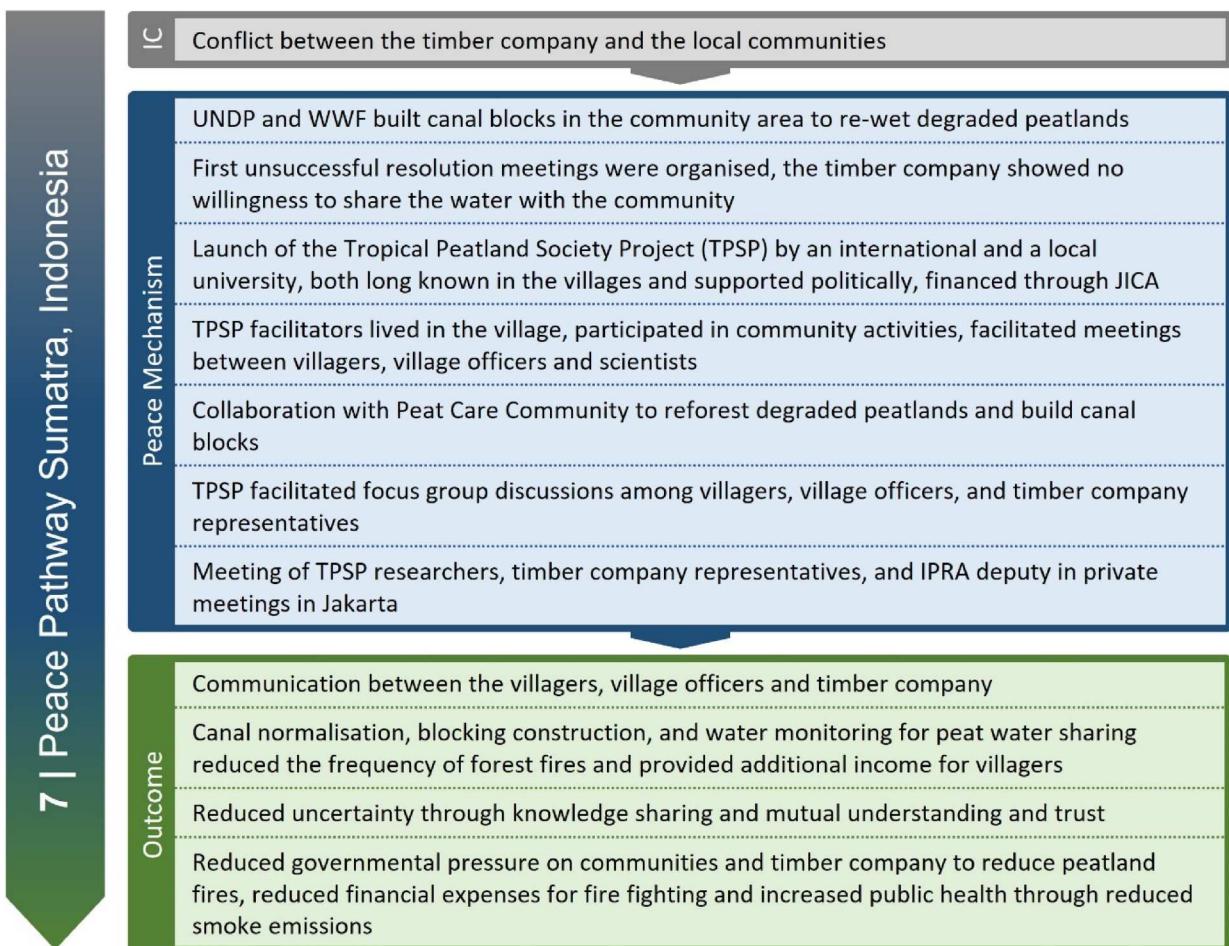


Figure 2 *Continued*

between the northern and southern communities (Ojha et al., 2019). Finally, collective-choice arrangements were strong amongst the Tziscao local community in case study 6. The community members jointly made all communal decisions through the *Asamblea*, working together to prevent forest fires and engaging in afforestation programmes. Through such close-knit relationships and collaboration, they were able to work together to manage the local common resource pool (Johnson & Nelson, 2004).

### 3.3.2. Inter-group relations

All seven case studies exhibited inter-group relations during the peacebuilding process. The local community cooperated with either non-governmental organizations (NGOs), research teams, timber operators, or the government at the local, district, and national levels. The relationship between the government and the local community is discussed below under state-society relations (Section 3.2.1.3).

In case studies 1 and 2, collaboration between the local community and other stakeholders had results like acquiring information about the root cause of the conflict and its consequences, equitable resource distribution, and the development of trust. This information was vital in ensuring the success of the peacebuilding process (Ojha et al., 2019). In case study 3, the participatory action research process unlocked the potential

of the CFUGs' networking. The process resulted in proactive networking and vertical collaboration by the CFUG with community forestry networks, bilateral agencies, district forest offices, and NGOs. Networking occurred through study visits and learning tours and was part of a self-monitoring process. CFUG members also regularly reflected on external relations. Initiatives on reflection failed collaboration, and the way forward toward cooperation with NGOs was conducted by the CFUG. Furthermore, the CFUGs assessed their indicators on external relations (McDougall & Banjade, 2015).

Similarly, in case study 4, the local community rallied together and formed networks to help influence decision-making and protection of the forest from encroachment. The local networks collaborated with district, national and regional stakeholders. NGOs sometimes assisted local networks in negotiating more strongly. For example, the Northern Farmers' Network and the Inter Mountain Peoples Education and Culture facilitated the expression of options by the upland minority people and empowered them to negotiate with the government. Furthermore, the Karen in Chiang Rai and NGOs "ordained the whole forest in a Buddhist ceremony and made it sacred" (Hares, 2009, p. 392). Additionally, in a bid to inform the government about their cultural and environmental perspective regarding slash-and-burn cultivation, the Karen and Lewa communities partnered with a

research institution and used a scientific study and a book publication to show the government their ability “to live in harmony” with the environment (Hares, 2009, p. 388).

In case study 5, youth and farmers collaborated with the timber operators by negotiating the purchase price of trees and compensation in instances where crops and property were destroyed during tree harvesting. On the one hand, the timber operators established a corporate network as a power source. For example, through SRA negotiations on tree felling affected by socioeconomic imbalance, the timber operators referred to the law, which legitimates their work and hired locally knowledgeable tree hunters. On the other hand, the community expected the timber operators to respect its norms and traditions for peaceful cooperation. Community members used statements like, “He abided by our rules,” (Ros-Tonen & Derkyi, 2018, p. 7).

Similarly, in case study 6, the local community collaborated with tourists by providing services such as selling tacos and quesadillas, acting as tour guides, renting out horses and boats, and providing accommodation. Collaboration was important because these were a source of livelihood for the local community. By achieving network sustainability, the community implemented reforestation and firefighting efforts to safeguard the forest as a tourist attraction (Johnson & Nelson, 2004).

Finally, in case study 7, The villagers collaborated with researchers to mitigate fire risks by restoring canals, monitoring water levels, and rewetting peatlands. The rewetting of the peatland by the villagers served as valuable research data for a study conducted by researchers from the Centre for International Forestry and Research (CIFOR), as well as local and international universities. In addition, the collaboration between the villagers and timber companies played a crucial role in resolving conflicts and obtaining essential information from both sides. For instance, the timber company informed the villagers regarding uncertainties surrounding water table regulations. Simultaneously, the villagers provided information to the timber company about the amount of water required in metric tons, fostering better understanding and cooperation between the two parties (Ramdani & Purnomo 2022).

### 3.3.3. State-society relations

All local community members in the six case studies collaborated with the government. The collaboration was with government representatives at the local, district, or national levels. Case studies 4–6 had existing established communal rules and structures, particularly concerning forest conservation. The government had also established policies to govern forests and their conservation. The collaboration between these parties led to the joint management of forest resources (Hares, 2009; Johnson & Nelson, 2004; Ros-Tonen & Derkyi, 2018). In case studies 1 and 2, the local community collaborated with the district forest office and representatives from the local government during their workshops. This collaboration was through deliberative dialogue, which led to equitable access to forest resources (Ojha et al., 2019). Similarly, in case study 3, the local community worked with the district forest officer in forest conservation programmes. This collaboration changed the attitudes of forest officers towards, for example,

firewood sellers; they recognized that consistent dialogue with firewood sellers aided the change in their livelihood strategy to ensure forest conservation. One officer said, “We were wrong in the past for blaming firewood sellers for [the] destruction of forest” (McDougall & Banjade, 2015, p. 8).

In case study 4, historical stereotypes that the government officials had towards the community and its lifestyle of opium production and shifting cultivation at first hindered the collaboration between the local community and government. Through fear of eviction, willingness to collaborate and hope for less stringent government forest rules arose within the community. The actions included developing voluntary tree planting within the village territories to demonstrate their potential in management and forest conservation. These acts led to government officials’ readiness to collaborate in forest management activities – for example, reforestation and fire control (Hares, 2009).

In case study 5, the government established rules regarding benefit sharing between the local community and the timber operators through SRAs. Government officials from the local district assembly, Forest Services Division (FSD) and Forestry Commission (FC) attended SRA negotiation meetings. FSD range supervisors transmit information to villagers on a scheduled tree harvesting process and permit allocation to a timber contractor. Additionally, FSD discussed the arrangements for crop damage compensation with the farmers. Customary community and statutory structures were linked during collaborations – for instance, by establishing a Community Biodiversity Advisory Group by the FC. The community members are mandated with clearing up the forest reserve boundaries and guarding against illegal forestry activities (Ros-Tonen & Derkyi, 2018).

In case study 6, the government employed the municipal police to complement the Tziscao community’s established communal rules on forest conservation through monitoring and sanctioning forestry activity and protecting tourists. In addition, the national park, regional, state, and federal government rules are communicated to the local community. The community did not participate in establishing government rules, so they collaborated with the government through the observation and implementation of proposals, rules, and regulations. However, government-imposed regulations undermine communal ownership, and thus local forest control, and lessen the community’s motivation for resource-use monitoring; this threatens the sustainability of the peacebuilding process (Johnson & Nelson, 2004).

Subsequently, in case study 7, government sub-district and village office leaders, along with army and police officers, collaborated with villagers and various stakeholders to collectively manage the fire. Additionally, the Ministry of Environment made the voluntary regulation previously implemented by the timber company mandatory, requiring them to take responsibility for fire mitigation activities within a 5 km radius beyond their concession area (Ramdani & Purnomo 2022).

### 3.4. Outcomes

The implemented measures in all seven case studies led to more peaceful relationships. Even though the reasons for

peacebuilding differ from one case to the other, there are similarities in the outcomes. In all case studies, local communities had an opportunity to participate in forest conservation, negotiate with the government on their wishes, and network with external stakeholders. Furthermore, through collaboration, the quality of services provided by the government improved. Similarly, a functional working relationship was established between the local community and the government.

A lack of involvement of all local community members in forest conservation and a denial of access to forest resources can cause conflict, as seen in case studies 1 and 2. We do, however, note that, through adaptive learning and deliberation processes, a peace mechanism can be initiated. Clarity of resource tenure and reliable resource governance were the reasons for instigating the peacebuilding process. The process ensured the involvement of all conflicting parties and further key stakeholders. The adaptive learning process ensured the analysis of root conflict causes, the involvement of diverse perceptions, needs analysis, and the participatory development of governance documents. The process continued along the peace pathway (Figure 2) (Ojha et al., 2019).

In case study 3, social capital differed between the elite members of the CFUG and those marginalized, resulting in internal conflicts and inequality between the members. The reason for initiating a peace mechanism was the CFUG members' wish to shift governance to the inclusivity and equality of all members. Changes were made in social capital concerning structures, rules, and norms, information-sharing, influence, and solidarity. Adaptive collaborative governance strengthened the social capital of the CFUG members. This resulted in changes in the governance and involvement of all members through capacity building, as summarized in Figure 2 (McDougall & Banjade, 2015).

In case study 4, the government's stereotyping of the local community contributed to the community's desire to prove their ability to conserve the forest and contribute to peace. Their resilience, persistence, and willingness to lead through interventions led to the initiation of the peace mechanism. The community's driver towards peacebuilding was their right to access forest resources, such as wood for construction, medicinal plants, and firewood. A similar motive was to manage and influence decisions regarding forest conservation and receive adequate help from the government in realizing alternative sources of livelihood, as well as to pass knowledge to the government and other stakeholders regarding their traditional lifestyle. All these efforts led to negotiations between government officials and the local community. These resulted in the local community having rights to a limited extraction of wood for their daily use, involvement in influencing decisions, and the management and protection of the forest. However, the government officials' views on slash-and-burn did not change, but they do have a working relationship with the local community (Hares, 2009).

The outcome from case study 5 indicates that conflicts not only emerge because of disputes over access to and benefits from resources, as most literature on natural resource conflicts suggests (Ros-Tonen & Derkyi, 2018). How social capital is mobilized is a key factor in explaining whether interactions between actors lead to conflict or cooperation. Although

various kinds of networks – such as traditional and local – play a role, we argue that cultural norms and trustworthiness are more significant than is acknowledged. Poor information and knowledge about rules and regulations among forest communities and farmers are used by the government and timber operators to create and maintain power imbalances. Hence, it is promising to create awareness and transparency about rights and responsibilities. The factors most conducive to the peaceful cooperation that all parties desire, in principle, include respect for local norms and rules, trustworthiness in complying with agreements made, prompt payment, transparency in the negotiation process, a perceived inclusion among all community members, a fair price for tending the trees, and compensation for crop damage incurred. These have resulted in SRAs being used for community development projects, such as purchasing land for a community clinic or employing youth. Furthermore, negotiations between farmers and timber operators on compensation for damaged crops are individualized (Ros-Tonen & Derkyi, 2018).

According to case study 6, an already established community with rules and regulations may be an important aspect of forest conservation and peacebuilding. The community of Tziscao is committed to its cultural heritage, even though, in addition to the communal rules, there were additional external rules from the national park and the municipality that regulated land use. Harmonization of the traditional and new external cultures and local and state institutions led to the complementarity between external policies and communal regulations. A strong relationship that had been created between the government and local communities translated into the establishment of informal land tenure, which was familiar, recognized, and respected by all within the community. All community members are entitled to utilize forest resources. Through the *Asamblea*, the community members have established rules, well known to everyone, which pertain to community activities, the subdivision of land use approaches for different areas within the communal land, and well-established internal mechanisms for monitoring and sanctioning improper activities. External authorities, including municipality police and the army, engage in forest monitoring (Johnson & Nelson, 2004).

Finally, in case study 7, the collaborative efforts yielded significant benefits to all stakeholders. Villagers received daily compensation for their active involvement in tasks such as monitoring the water table and constructing canal blocks. The researchers successfully gathered valuable data on peat water flow in the canals which they subsequently published. The timber company's budget for fire mitigation was reduced as they received funding from the project. Furthermore, they obtained valuable water data recorded by the researchers, which allowed them to assess the potential positive effects of water sharing on the rewetting process. Additionally, the local army and police officers experienced reduced pressure from the national office due to the decrease in fire incidents resulting from the rewetting of degraded peatlands (Ramdani & Purnomo 2022).

#### 4. Conclusion

In this paper, we have analyzed seven case studies from Nepal, Thailand, Indonesia, Ghana, and Mexico to understand how

forest conservation can contribute to environmental peacebuilding. Drawing on the framework of Dresse et al. (2019), we have identified eight peacebuilding approaches that were instrumental in driving the peace mechanism: (1) creating spaces for dialogue between community members and external actors; (2) strengthening the social capital of communities; (3) adopting traditional customs and norms; (4) promoting adaptive learning and deliberation; (5) involving communities in participatory action research; (6) initiating a collective choice arrangement system; (7) tackling uncertainty through knowledge sharing, and (8) including a neutral convenor to initiate dialogue processes. Forest conservation programmes can bring diverse groups together, including communities, government representatives, and researchers. This can become an opportunity to rethink existing perceptions of each other. Furthermore, it is promising when forest conservation programmes integrate measures to strengthen the social capital of communities, as this can reduce the risk of intra-communal conflict and better enable communities to make collective choices and stand up for their interests. They are the ones most affected by any conservation measure, so their rights and needs should also be at the center of any conservation effort. This implies that governments should be open to traditional customs and norms and be willing to integrate them into formal legal structures. Some case studies have shown that the adaptive learning and deliberation approach and participatory action research can help to pave peace pathways, posing the question of the roles and legitimacy that researchers play as well as their critical reflection in respective peacebuilding processes. It would be promising for further research to specifically look for and analyze cases where forest conservation has improved cooperative relations between actors rather than primarily focusing on conflict outcomes.

Youth employment and networking were a part of the peacebuilding process. In addition, forest-dependent communities are key stakeholders in the peacebuilding process and, therefore, need chances to prove that they can conserve and independently manage forest resources. Equally, the government and other stakeholders ought to willingly and open-mindedly learn and respect local communities' cultural values, interests, and perspectives on forest conservation. This can be achieved by exchanges like meetings and joint cultural and religious events themed toward knowledge exchange and reconciliation between the stakeholders. A collective understanding of forest resource conservation fosters confidence amongst stakeholders, culminating in successful collaboration and conflict resolution. Furthermore, the government's establishment of forest conservation programmes that fully involve communities by giving them high responsibility and rights can lead to ownership and conflict resolution.

Similarly, local networks are key to conflict resolution because they strengthen local communities' influence over decision-making and the development of agreements that improve relations between key stakeholders. Stronger intra-communal structures can lead to (intra-) communal conflict management; this ought to be strengthened through intra-community forums. We further argue that even though government policies on forest conservation are important, they may undermine local community rights. Joint development, adoption, utilization, and

monitoring of a blend between formal rules, traditional methods and local institutions are central to conflict resolution. These findings are relevant as they may help design forest conservation approaches that are conflict-sensitive and actively contribute to environmental peacebuilding. Further research is needed to understand better how formal and traditional institutions, rules, and regulations can be integrated.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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