Land Governance in Myanmar

How Powerful Actors Shape Land Use Decision-Making

Inaugural dissertation
of the Faculty of Science,
University of Bern

presented by

Lara Maria Lundsgaard-Hansen

from Bern, Switzerland

Supervisors of the doctoral thesis:
Prof. Dr. Peter Messerli
Prof. Dr. Flurina Schneider
PD Dr. Manuel Fischer

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The Dean
Prof. Dr. Zoltan Balogh

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Summary

Land governance in Myanmar, Southeast Asia, has seen major changes in recent decades. Civil war and the military regimes from 1962 to 2010, and the subsequent transition and reform period from 2011 to 2015, have had significant impacts on land governance and land use throughout Myanmar. Resulting land conflicts have posed considerable challenges to sustainability and peace. During the 2010s, some attempts were made towards more inclusive decision-making processes in land governance, but many obstacles still remained in place.

Land governance regulates – among other things – ownership of land, access to land, decision-making over land use, and corresponding policies and laws. With regard to land governance in Myanmar, the present doctoral dissertation investigates the collective processes whereby decisions over access to and use of land are made by various interrelating actors from different scales and at different levels. Firstly, this dissertation aims to generate a broad, yet in-depth understanding of the main characteristics of local land use decision-making, including crucial aspects of actor networks, actor agency, and power. As data collection began in 2016, the analysis mainly focuses on the period up to 2015, when Myanmar was under military rule (1962–2010) and a then quasi-civilian government (2011–2015). Secondly, this dissertation aims to investigate whether multi-stakeholder processes can support a transformation towards more inclusive land use decision-making in Myanmar. To this end, the PhD candidate accompanied a multi-stakeholder platform beginning under the democratically elected government (2016–2020), which addressed land conflicts around oil palm concessions. In pursuit of both research aims, the present dissertation mainly uses qualitative methods in the context of a case study approach in southern Myanmar.

Regarding achievement of a broad, yet in-depth understanding of the main characteristics of land use decision-making (first aim), the present dissertation reveals that uneven distribution of means (resources such as goods, financial and human capital, information, and formal land titles) between actors generally leads to unequal decision-making power. Overall, actors with more means can exclude those with fewer means from land use decision-making, the latter being predominantly smallholders. In addition, two particular characteristics appear to strengthen the position of actors in land use decision-making. First, the ability of an actor to forge alliances with other high-means actors – even over distance – increases its power. Second, having access to formal institutions – such as land titles or laws and policies which can be interpreted in favour of the actor – can strengthen the power an actor possesses. In this way, if high-means actors form a network and join forces in Myanmar, they can completely dominate other actors in local land use decision-making, especially because poorly networked, low-means actors also generally lack formal or informal institutions to back them up. Accordingly, powerful land-governance actors in Myanmar are usually either members of, or collaborators with, the country's elite including the military. The present dissertation even concludes that the engagement of particular actors in land use decision-making has contributed to the outcomes of Myanmar's civil war (up to the 2010s), such that land governance can represent a form of war- and/or state-making.

Regarding the transformation potential of multi-stakeholder processes in land use decision-making (second aim), the present dissertation shows that the platform under study represented an attempt of democratically elected Myanmar government representatives to become more inclusive regarding land use decision-making processes. The attempt, however, was only partially effective for a variety of reasons described. Ultimately, the most powerful actors made certain key decisions outside the platform, without consultation of platform stakeholders. While these decisions might have been well-intended, the lack of consultation sowed dissatisfaction in civil society, frustrating civil society organizations' expectations. These results show that designing and governing a multi-stakeholder platform in a setting of entrenched land conflicts and power disparities should be done very cautiously – if at all – as it bears the risk of exacerbating conflict.

The present dissertation is embedded in land system science and contributes to a better understanding of the role and perspectives of land use decision-making in the context of land governance in Myanmar. It sheds further light on aspects of telecoupling via actor alliances over physical, social, and institutional distance, as well as on the role of formal and informal institutions, power, and tradition in land governance.

Acknowledgements

This doctoral dissertation was carried out at the Centre for Development and Environment (CDE) and the Institute of Geography at the University of Bern. The research was part of the project titled "Managing Telecoupled Landscapes for the Sustainable Provision of Ecosystem Services and Poverty Alleviation". This project was carried out within the Swiss Programme for Research on Global Issues for Development (R4D programme), funded by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC).

My first thanks go to my main PhD supervisor, Prof. Dr. Peter Messerli. He made this PhD study – and therewith my current life path – possible through his commitment to me as his doctoral candidate. He always made me feel that he believed in me and my skills, while also encouraging me to improve my strengths and face my weaknesses. He provided clear guidance and inspiration, while also motivating me to explore and pursue my own research interests. Further, my very special thanks go to Prof. Dr. Flurina Schneider, PD Dr. Manuel Fischer, Ass. Prof. Dr. Christoph Oberlack, Ass. Prof. Dr. Florence Metz, and Dr. Julie Zähringer. They all supported me considerably by co-designing and supervising my methodology, jointly writing and revising publications, discussing and reflecting on results, and much more. Further, Flurina Schneider, Julie Zähringer, and Christoph Oberlack worked hard to sustain my exciting employment at CDE, despite the generally challenging conditions at Swiss universities of temporary working contracts, while I was simultaneously founding a family. On this last point, I would also like to express my gratitude to CDE as an organization, which has always striven to find employment solutions, with Barbara Willi being another key person. Additionally, I would like to thank Dr. Joan Bastide, the CDE country representative for Myanmar at the time, for granting me access to the OneMap Myanmar Project and for spending hours discussing things with me. My thanks also go to Marlène Thibault and Anu Lannen for patiently and carefully editing my publications, and to Simone Kummer for her creative support in illustrating concepts and frameworks. My special thanks also go to Sara Frey, Kaspar Hurni, and, again, Christoph Oberlack for being patient with me on the final stretch of this PhD and for helping to keep me free from project coordination tasks at certain points. Last but not least, I wish to thank Prof. Dr. Christian Kull for very flexibly and reliably co-evaluating this PhD dissertation and Prof. Dr. Thomas Breu for very constructively chairing my PhD defence.

For safety reasons, I will refrain from naming most of my Myanmar colleagues and informants in what is now a very politically fragile context. It goes without saying that these persons deserve to be highlighted for their support and knowledge sharing – especially considering that their contributions were largely non-political. I sincerely regret these circumstances and hope that the future holds much more peaceful, worry-free times. At present, I would like to express my deepest gratitude to all my (for now, largely anonymous) partners, informants, hosts, and other collaborators in Myanmar for their invaluable support, endless patience, and great hospitality. A very special thanks goes to the research team, leading and working for the Environmental Conservation and Community Security Institute (ECCSi), including Dr. Win Myint and Aung Myin Htun, who have always supported me unconditionally– work-related as well as privately. You have become my Myanmar family and lifelong friends and I wish you all the best for your private and professional future. My warmest thanks go to my closest colleague and friend from Myanmar. Without her, this research could never have been conducted the way it was. With her very reliable, correct, warm-hearted, and humorous nature, she opened doors and hearts everywhere and securely navigated me through culture, research contacts, research permits, as well as long travels – and became my Myanmar sister. We spent countless hours together at the office, in villages, hostels, buses, her home, etc. and I will never forget her generosity, kindness, cleverness, and fortitude. A true inspiration.

I would also like to express my gratitude to individuals from my private life. First of all, I would like to thank my parents and other close family members such as my grandmother and brothers, as well as my parents-in-law, for their strong support in the background. You always showed interest in my research and path of life, helped with taking care of our daughter Naira, and even provided financial support in rough times. All of this was crucial for me to pursue my doctorate. I would also like to thank my close friends for their immense patience with me while we were living abroad, while I was virtually unavailable on the final stretch of the PhD, and also for letting me live in their apartments for writing retreats.

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Preface

This PhD study is dedicated to contribute to a more sustainable land governance in Southern Myanmar. But what does "sustainable land governance" mean in this context? Albeit the efforts of the author to remain as objective as possible, it is inevitable that personal values form the basis of this research endeavour. Therefore, I would like to transparently formulate a short description of what my perception of "sustainable land governance" encompasses (not to be understood as an exhaustive analysis): In my understanding and driven by my personal values and experiences in Myanmar and elsewhere, I attribute the following words to sustainable land governance: inclusive, transparent, just, gender-sensitive, sensitive to ethnic and customary affairs, reflective, open-minded, resource-efficient, -conserving, and -sparing, inclusive of short- and long-term interests, resilient, adaptive, transformative, appreciative, development-oriented for poverty alleviation.

From my point of view, researchers can never be entirely free from values, even if they try hard. But researchers can critically reflect on their own values, transparently communicate them, and position the research and its results within the researcher's value system.

The present version of the dissertation was updated in 2023 before publication in order to incorporate the final PhD paper (paper VI), which was published in 2022. Thus, some changes compared to the submitted dissertation (2021) can be found in section 4.7. and paper VI (pages 154-194). This update before publication of the dissertation was undertaken in order to do no harm to research colleagues and participants as a result of the military coup in Myanmar in 2021. Together with some colleagues at the CDE and partners, we conducted a sensitivity check of paper VI in 2021 and 2022, based on most recent developments in Myanmar. Further names were anonymised and formulations adapted. Consequently, we decided to substitute the version of paper VI (draft) from 2021 with the published version of paper VI from 2022 for thesis publication. This was approved by the Dean's office.

Disclaimer regarding military coup 2021

The latest political development in Myanmar after the military coup on February 1, 2021 and its impacts on land governance and land use decision-making are not part of this PhD study, as the research refers to the situation preceding these developments. However, in the outlook of the thesis, I provide some interpretations of how Myanmar's future land governance and land use decision-making could look like, based on what the past and present tell us.

Abbreviations

CA	Commercial Agriculture (such as in LUC_{ca})
CF	Community Forestry
CSO	Civil Society Organization
KNU	Karen National Union (an ethnic political organization)
LUC	Land Use Change
LUDM	Land Use Decision-Making
MSP	Multi-Stakeholder Platform
NR	Nature Reserve (such as in LUC_{nr})
OMM	OneMap Myanmar
OP	Oil Palm (such as in LUC_{op})
R4D	Research for Development (project)
WP	Work Package

PART I – The Thesis

1. Introduction

1.1. Land governance and land use decision-making

Land governance constitutes a relevant field of research in land system science (Global Land Programme, 2016; Verburg et al., 2013). The term "governance" in this study is defined according to Graham et al. (2003, p.ii) as follows: "*We define governance as the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken, and how citizens or other stakeholders have their say. Fundamentally, it is about power, relationships and accountability: who has influence, who decides, and how decision-makers are held accountable.*" This definition implies that a multitude of diverse actors and institutions – formal and informal – from different scales and at different levels are part of the governance scheme, where decision-making processes take place, including the national state and other actors (Biermann et al., 2009; Jessop et al., 2008). With respect to land, land governance therefore regulates among others property of land, access to land (Ribot & Peluso, 2003; Sikor & Lund, 2009), decision-making over land use and land use changes (LUC), and policies and laws with regard to land and land use. Although, land governance elements can overlap or – in the contrary – conflict with others at some point or even be contradictory (Graham et al., 2003).

Drawing from the insights of Graham et al. (2003), Jessop et al. (2008), and Biermann et al. (2009), this PhD study refers to *land use decision-making* (LUDM) as all these collective processes in which decisions over access to and use of land are made by various interacting actors across different scales and levels. Unlike the more agent-based understanding of LUDM (emphasizing individual cognitive decision-making by land users), this governance-oriented understanding of LUDM thus focuses on issues such as the following: the role actor networks play in decision-making processes; how actors are being influenced by formal or informal institutions; what actors exert influence on others in these processes; what agency they have; and/or who is included in (or excluded from) a decision-making process. Similar to the concept of land access (Ribot & Peluso, 2003; Sikor & Lund, 2009), this governance-oriented understanding of LUDM also enables researchers to shed light on crucial aspects of power and authority. In this sense, this PhD study perceives LUDM as an important, subordinated element of land governance.

1.2. Why land governance and land use decision-making matter in Myanmar

Land governance in Myanmar has seen major changes over the past decades. The military government in power from 1962 to 2010 established a highly centralised, authoritarian state and a strongly regulated economy (Prescott et al., 2017), reducing foreign influence to a minimum. Ethnic armed organizations resisted the central government in what became a long civil war, and Myanmar was outpaced economically by its neighbouring countries. The military government implemented agricultural master plans, reformed its land-related laws and policies, and granted concessions to wealthy or military-related investors in order to increase the number of prosperous large-scale agricultural projects that would boost development (Fujita & Okamoto, 2006; Kenney-Lazar, 2016; Oberndorf, 2012; Thein et al., 2018; K. Woods, 2015). Previous local land users—most of them smallholders and many practising shifting cultivation—were usually excluded from LUDM in such government-initiated projects, and therefore lost access to the land they had been using. Many large-scale agricultural projects were implemented in ethnic minority areas or areas of insurgency, raising concerns that these development initiatives may have served purposes of control, war- and state-making (Gum Ja Htung, 2018; Lundsgaard-Hansen et al., 2021; Woods, 2011). Moreover, agricultural expansion led to considerable deforestation (Lim et al., 2017; Woods, 2015). Furthermore, especially after a quasi-civilian government took office in 2011, increasing liberalisation of the agricultural sector and the decrease in armed conflicts in some areas led to spatial expansion of cash crops like rubber at the cost of forest ecosystems (Kenney-Lazar et al., 2018; Myint, 2015; Scurrah et al., 2015; Woods, 2012), often adopting environmentally unfriendly practices. A major consequence of all these developments were entrenched land conflicts throughout Myanmar.

However, land users face a complex and often incoherent conglomerate of laws and policies that has accumulated over the past decades and makes land tenure a conflictive issue in Myanmar (Mark, 2016). In areas where the Myanmar government and ethnic political organizations both claim authority and decision-making power, land users are even exposed to contradictory policies on land (see annex of Paper II).

These developments in Myanmar's land governance and LUDM and the resulting entrenched land conflicts pose considerable challenges to sustainability and peace. It seems therefore important to firstly generate a better understanding on the main characteristics of LUDM and secondly to analyse potential pathways for transforming LUDM towards more inclusion.

1.3. Embedding the doctoral dissertation

This doctoral dissertation was part of the Research for Development (R4D) project "Managing Telecoupled Landscapes for the Sustainable Provision of Ecosystem Services and Poverty Alleviation" (short name: "Telecoupled Landscapes") steered by the Centre for Development and Environment (CDE) of the University of Bern, Switzerland. It was funded by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC). The project was conducted in Laos, Madagascar, and Myanmar. It aimed at devising and testing innovative strategies and institutional arrangements for securing ecosystem service flows and human well-being within and between telecoupled landscapes. This PhD study contributed to this project by understanding land governance and potential learning processes for a governance transformation in the case of Myanmar. For the latter – the potential learning processes in land governance – the present dissertation was also connected to the former OneMap Myanmar (OMM) Project, a project funded by the SDC.[1] In Myanmar's Tanintharyi Region, OMM Project facilitated a multi-stakeholder process to review the oil palm sector of Myanmar. This PhD study accompanied the multi-stakeholder process for research purposes.

1.4. The thesis

The R4D project was divided in three Work Packages (WP), each of which was further subdivided into several research tasks. This doctoral dissertation was designed to contribute to two WPs. Firstly, it contributed to WP1 and more specifically to research task 1.1 on "analysing land use decision-making under telecoupling". Secondly, the PhD study contributed to WP3 on facilitating and monitoring "learning for adaptation".

The present doctoral dissertation dedicates one research aim to each of the two WPs, whereby the insights from the first aim (WP1) are used to embed the insights from the second aim (WP3). Firstly, the thesis generates a broad, yet in-depth understanding on the main characteristics of LUDM. As data collection began in 2016, the analysis mainly focuses on the period up to 2015, when Myanmar was under military rule (1962–2010) and a then quasi-civilian government (2011–2015). Secondly, the thesis investigates whether multi-stakeholder processes can support a transformation towards more inclusive LUDM in Myanmar. To this end, the PhD candidate accompanied a multi-stakeholder platform (MSP) beginning under the democratically elected government (2016–2020), which addressed land conflicts around oil palm concessions.

The doctoral dissertation is guided by the following research questions:

1) What role do actors' agency play in LUDM?
2) How do powerful actors from near and far engage in LUDM, and with what impact?
3) Can MSPs be a supportive means towards a more inclusive LUDM?

[1] Not to confuse with the OneMap Myanmar (OMM) Initiative, which is a Myanmar government-led initiative. For more details, see section 2.3.

2. Contextual background

2.1. Historical background of Myanmar

Almost since independence from Britain in 1948 as well as under the different forms of military-led regimes from 1962 until 2010, Myanmar has experienced one of the world's longest-running civil war (Brenner & Schulman, 2019).[2] In 1962, General Ne Win seized power in a coup d'etat. He expanded the military by recruiting mainly Bamar (Burmese) males. This and later military regimes became markedly ethno-nationalist in their character, envisioning a unified Myanmar based on Bamar Buddhist identity (Jolliffe, 2016). The central state removed local governments of previously federal, ethnic states, and developed a deep military state. Shan, Kachin, Karen, and other ethnic armed movements rose in power and armed conflicts escalated dramatically across the country (Jolliffe, 2016). Very likely, the civil war was rooted in the precolonial divide between the country's centre and its borderlands, according to which the ethnic majority of Bamar have lived and ruled in the centre of today's Myanmar and other ethnic groups have long governed themselves in the more mountainous regions of today's borderlands (Brenner & Schulman, 2019). British and later Japanese rule and occupation deepened this divide in various ways. Decided to be united in one multi-ethnic country following independence in 1948, the ethnic minorities in the mountainous borderlands grieved over their lack of influence in political decision-making, absence of development in their areas, and repression of their cultural and religious freedom, compared to the ethnic majority of the Bamar in the country's centre (Kramer, 2015). In contrast, the authoritarian Bamar-led regime developed a self-image of being the guardians of the Myanmar state, with the central military considered as the main actor responsible for unifying all ethnic groups in one Myanmar (Brenner & Schulman, 2019; Jones, 2014). At the same time, the inequitable distribution of resources between the Burman centre and the resource-rich ethnic borderlands is believed to be the key driver of ethnic conflict in Myanmar (Kramer, 2015). The military-led central state increasingly conducted so-called development projects in the borderlands such as agribusiness, resource extraction ventures (minerals, precious stones, natural gas etc.), and hydropower facilities (Buchanan et al., 2013). These projects typically exported the resources to provide revenue to the state as well as income to local-level commanders from the Myanmar military and rebel groups' splinter groups (Jolliffe, 2016). Several scholars and civil society representatives argue that the Myanmar military-led state used these development projects during civil war and ceasefires as a means to expand the state's influence into government-non-controlled areas of the borderlands (Barbesgaard, 2019; Buchanan et al., 2013; Ferguson, 2014; Gum Ja Htung, 2018; Kenney-Lazar, 2016; Thein et al., 2018; Woods, 2011a; Woods, 2019).

Following pro forma elections in November 2010, a quasi-civilian government ruled between 2011 and 2015, still under the strong influence of the military. It negotiated various regional ceasefire agreements after 2011 and oversaw a nationwide ceasefire agreement in 2015 (Lundsgaard-Hansen et al., 2018; Schneider et al., 2020). Once these ceasefire agreements were finally reached, conflicts declined between the Myanmar military and many (but not all) ethnic armed organizations (also called rebel groups), and internally displaced people and refugees returned to their homes in some areas. However, many still remain in provisional camps or migrated elsewhere due to loss of land to land acquisitions during their absence, environmental damage of their natural resource base as a cause of war, fears of violence, eroded infrastructure or social institutions (Displacement Solutions, 2013; KHRG, 2019; Transnational Institute, 2017). The quasi-civilian government also issued several land-related reforms (Lundsgaard-Hansen et al., 2018; Schneider et al., 2020), which ushered in new land-related policies, laws, and committees aimed at managing land use and tenure centrally and formally (instead of customarily). However, pre-ceasefire problematic laws, power structures, and institutions from the past were not dissolved (Conservation Alliance of Tanawthari, 2018; Franco et al., 2015; Kenney-Lazar, 2016; Mark, 2016; Oberndorf, 2012).

[2] The text in sections 2. (Contextual background) and 3. (Approach and methodology) partly found on respective sections in the papers, of which I am the first author (Paper II, II, VI). For not reducing readability of the two sections, I intentionally refrain from constantly citing my own papers. However, where I make comparably strong statements, I include the citation of my own research papers.

From 2016 to early 2021, Myanmar was led by a democratically elected civilian government, while still under the strong but largely hidden influence of the military. Centralization of state authority continued (Stokke & Aung, 2020) and many land uses and changes implemented until 2015 remained, including agricultural concessions and conservation zones in the borderlands. Myanmar found itself mired in countless unresolved land disputes and a situation of legal pluralism and ambiguity (Mark, 2016); a common state of affairs among post-conflict societies (Unruh & Williams, 2013).

Since the most recent military coup on 1 February 2021, the country is again in turmoil, appearing at the beginning of another era of civil war.

2.2. Disentangling three eras of Myanmar's changing land governance

Mirroring the political turmoil of the country, Myanmar's land governance is rather complex. For the purpose of this study, I divided Myanmar's land governance in three eras.

1962 – 2010: military regimes

During this era, land governance was determined by formal and informal institutions favouring the well-connected and rich domestic elite, including the military high ranking officials (Lundsgaard-Hansen et al., 2018; Mark, 2016; Schneider et al., 2020; Thein et al., 2018). Many large-scale land concessions were granted between 1988 and 2010, but particularly to those who already had access to political and economic resources (Mark, 2016). Many land appropriations occurred in the borderlands, which are usually lands of ethnic minorities using a customary system (Scurrah et al., 2015), what fuelled already existing armed conflicts. The 1990s and 2000s saw the land of many rural communities expropriated in the name of national defence for security reasons, military encampments, and food production to support military personnel (Scurrah et al., 2015). Most investors during these times were typically linked to the military and/or members of the rich, predominantly Burmese elite owning "crony companies" (Mark, 2016; Scurrah et al., 2015; Woods, 2012, 2015).

2011 – 2015: quasi-civilian reform period

The passage of the 2008 Constitution, issued under the military regime, paved the way for a quasi-civilian rule, albeit where the military was guaranteed 25% of the seats in parliament and an effective veto on constitutional reform (Kenney-Lazar & Hunt, submitted). Through general elections, the military-backed Union Solidary and Development Party – many of its members being (ex-)military members in civilian clothes – formed the government 2011-2015. During these years, many land reforms were enforced, which pushed land formalization and thus heavily influenced tenure rights and investment incentives (Lundsgaard-Hansen et al., 2021; Mark, 2016), again mainly favouring the elite (Schneider et al., 2020). The result was an increase in domestic and foreign investment in natural resources and land, but most of them were still connected to the politically and economically powerful elite (Scurrah et al., 2015; Woods, 2012, 2015). Simultaneously, the quasi-civilian government recognised the long legacy of land confiscations across the country and the respective anger in civil society. During its rule, the quasi-civilian government started to establish committees to document and solve land conflicts, and began a process to draft a new National Land Use Policy resulting in consultation processes (Kenney-Lazar & Hunt, submitted).

2016 – 2020: civil government

In 2015, the opposition party National League for Democracy under the leadership of Aung San Su Kyi won the democratic elections in a landslide. As a consequence, a mostly true civil government led the state affairs 2016-2020 (still with 25% of parliament being military members). After coming in power, the civil government halted some of the processes established in 2011-2015 at national level, such as the committees and the National Land Use Policy process (Kenney-Lazar & Hunt, submitted). At the beginning of the civil government era, the Myanmar multi-ethnic population and land activists had a rather positive attitude toward and trust in the civil government. After several months, however, criticism increased about, for example, the continued – or partly even increased – ignorance of customary land management systems, ethnic land rights, and gender-related issues (Kenney-Lazar & Hunt, submitted). After several years in office, the civil government began to resume halted or to establish new land committees and consultation

processes, and to implement pro-farmer articles of the National Land Use Policy, while some other struggles and contradictions continued to remain (Kenney-Lazar & Hunt, submitted).

To date, Myanmar's land governance remains characterised by an opaque legal pluralism. Over decades, the different regimes and governments had created "stacked laws" (Mark, 2016). This term implies that Myanmar has multiple layers of laws that exist simultaneously, leading to conflicts, contradictions, and arbitrariness in the legal system. Accordingly, powerful stakeholders could – and can continue to – enforce or adhere to the most beneficial law or policy in the given situation, deliberately favouring one law or policy out of the many (Mark, 2016).

The military coup of 1 February 2021 put an end to the recent democratization processes, with an uncertain future for land governance and the country as a whole.

2.3. Case study

Our case study area is Tanintharyi Region in the south of Myanmar (see Figure 1). It is situated in one of the country's borderlands where armed conflict prevailed until 2011, in particular between two parties: the Myanmar state and the Karen National Union (KNU; an ethnic minority political organization) (Jolliffe, 2016). After independence from Britain in 1947/48, the Karen people's request to form their own state to obtain territorial sovereignty was ignored by the Burmese and British leaders, resulting in a Karen rebellion led by the KNU (Brouwer & van Wijk, 2013). The military coup in 1962 worsened the tensions. For decades, the two rivals fought for territorial control, first in various areas of Myanmar, and later mainly in the southeast of Myanmar[3].

The transformation to a quasi-civilian government in 2011/2012 led to the signing of a durable regional ceasefire agreement between the Myanmar state and the KNU – followed by a national agreement in 2015. At some point, the KNU altered its request and communicated in its strategic mission that there should be a Karen state with a just and fair territory and self-determination within the Federal Union of Myanmar (Karen National Union, 2018).

To date, Tanintharyi Region remains a mixed control area, meaning that both the Myanmar state as well as the KNU claim sovereignty over the territory[4]. The territory requested by the KNU is about three times the size of what the Myanmar state defines as the "Karen State", and includes Tanintharyi Region in Myanmar's south (for maps, see KHRG, 2018). Both factions have their own – in part rival – land governance systems. In our study area, ethnic Bamar villages usually follow the governance system of the Myanmar state, while Karen villages try to follow both systems.

Case study villages as an entry point to explore LUDM

Our case study villages are located in Yebyu Township, northern Tanintharyi Region (see Figure 1). In order to avoid exposing them to possible political repercussions or other consequences given the current politically fragile context, we refer to our case study villages as Village A and Village B and do not share their exact location. In the 1990s, the Myanmar military set up a main base for several years near the case study villages, during which time Karen ethnic people suffered serious human rights violations by (Bamar) soldiers, including rape of women, torture, killing, and denying access to cultivated plots, markets, and food.[5] Moreover, in both case study villages (Bamar and Karen), residents were forced to provide food to troops on both sides, and were forced to work as porters or construction labourers for the Myanmar military. Village A has a predominantly Karen-Christian population, whereas Village B is mainly Bamar-Buddhist. Village A lies in the immediate vicinity of an oil palm concession and in a zone considered ineligible for land use certificates (land titles) by the Myanmar state[6], having been previously officially declared a "Reserved Forest" area (a legacy from colonial times) without allowance for agricultural

[3] There are multiple armed Karen groups under the KNU. The composition and arrangements of these armed groups are highly complex. For more information on the KNU's history, internal problems, and arrangements with armed Karen groups see Brouwer & van Wijk (2013) and Jolliffe (2016).

[4] In some parts, there is even a third actor who claims sovereignty: the New Mon State party (NMSP).

[5] To our knowledge, the KNU never perpetrated such crimes on Bamar villages in this case study area.

[6] In recent years, the KNU has started offering land use certificates to farmers in Village A.

cultivation of land (see Figure 1). However, the officially declared zones of Reserved Forest do not match the land use on the ground in reality. As Reserved Forest was implemented poorly, agricultural plantations can be found in many places. By contrast, residents of Village B can apply for formal land use certificates issued by the Myanmar state for agricultural use (since 2012), as it is situated in a zone where agriculture is legally permitted. Further, Village B is situated at the edge of a nature reserve.

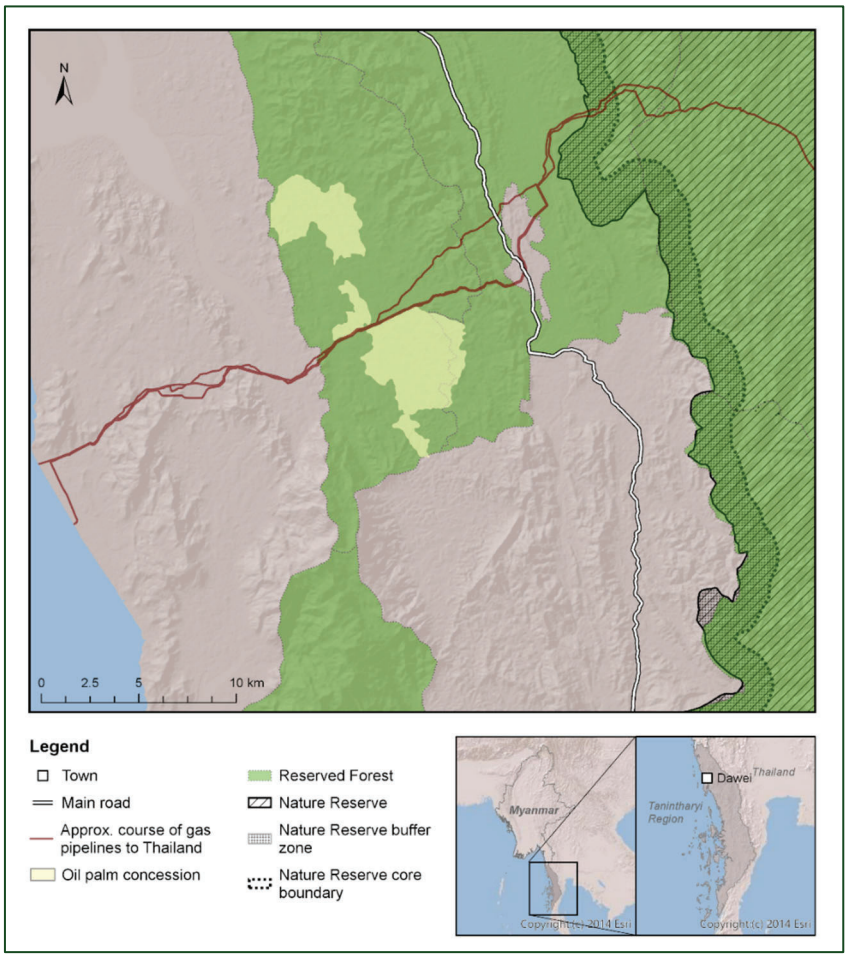

Figure 1: Map of the area where the case study villages are located, without sharing their exact location (Lundsgaard-Hansen et al., 2021)

By means of focus group discussions (see methodology section), we identified three main LUCs. Starting in the 1990s, they can be summarized as follows (for more detailed information on the LUCs and visual illustrations, see Paper I-III):

1) LUC_{op} (only in Village A): A military company received a land concession and converted forest, shifting cultivation areas, and some smallholder cash crop plantations into a large-scale *oil palm* monoculture. The conversion started in the 1990s and the company expanded the planted area until 2010. Local smallholders lost access to land.

2) LUC_{nr} (only in Village B): In 2005, international oil and gas companies started sponsoring the implementation of a 170,000 hectare (ha) *nature reserve* (affording stricter protection status than the prior "Reserved Forest") as an environmental compensation for their natural gas exploration and production starting in the 1990s. Conservation enforcement of the nature reserve was low during the war but increased during the ceasefire period. A semi-state-owned conservation organization was in charge of implementing and monitoring the nature reserve. Smallholders gradually lost access to the forest. 12 years

later, Village B achieved to obtain a community forest in the buffer zone of the nature reserve, making the use of some forest products possible again.

3) LUC_{ca} (in both villages): A regional private agribusiness, many regional land speculators, and local smallholders contributed to the expansion of private sector *commercial agriculture* at the expense of forest and shifting cultivation. The new land uses were predominantly small- or medium-scale mixed- as well as mono-cultivation of rubber and betel nut, but also cashew nut and other crops. This LUC started in the late 1990s and intensified in the 2000s and 2010s (for spatial visualisation of the cash-crop boom, see Paper I).

The multi-stakeholder platform

The quasi-civilian government of 2011-2015 initiated the OneMap Myanmar (OMM) Initiative, which has continued to exist until today. OMM Initiative is a Myanmar government initiative aiming at providing access to accurate, consolidated and user-friendly data related to people, land, and natural resources, in order to make decision-making and planning for sustainable development more effective (OneMap Myanmar, 2018, 2020). With the funding support of the SDC, the Myanmar government together with the SDC launched an international project call to support the OMM Initiative in its implementation. Consequently, the OMM Project was launched in 2015 (and dissolved again in 2021 after the military coup). The implementing organizations of this OMM Project were a Myanmar Civil Society Organization (CSO; anonymized) and the Centre for Development and Environment of the University of Bern (OneMap Myanmar, 2018, 2020).[7]

After reading a speech of the Tanintharyi Regional Chief Minister in the newspapers, in which she announced to address the land issues related to oil palm concessions, OMM Project visited her in September 2016 to discuss her ambition. OMM Project suggested to start with mapping the oil palm concessions and to set-up an MSP to supervise the progress. The Regional Chief Minister supported this idea and ordered the set-up of the MSP. Within a few months, the MSP was launched with representatives from government (regional level), palm oil companies, CSOs, and the ethnic political organization KNU. This PhD study accompanied the MSP with qualitative data collection including participatory observation during the MSP meetings and interviews.

[7] OMM Project was stopped in 2021 due to the political crisis, even though it was originally planned to continue until 2023.

3. Approach and methodology

3.1. Concepts and conceptual lenses

Telecoupling

The overarching R4D project aimed at identifying and investigating telecoupled landscapes in rural, forest-frontier contexts in Laos, Madagascar, and Myanmar. Therefore, the Telecoupled Landscapes project as well as the present doctoral dissertation adopted the telecoupling framework (Liu et al. 2013; Eakin et al. 2014; Friis et al. 2015; Niewöhner et al. 2016) as an analytical lens. For analysing land governance in the context of Myanmar, where the influential networks behind LUDM often remain opaque, the heuristic approach proposed by Eakin et al. (2014) seemed most suitable. This concept allows to follow networks of actors bridging two or more separate systems. In other words, Eakin et al. (2014) propose a mixed and rather flexible approach for research, combining for example the telecoupling framework with network studies.

For this doctoral dissertation, the telecoupling framework was neither strictly applied nor was it tested. It served as an analytical lens to develop the methodology such as the actor network approach (see below) and to analyse and interpret the data.

Relation between land use decision-making and land use change

The present dissertation employs a governance-oriented understanding of LUDM. In this way, I use the term LUDM to refer to all the dynamic and collective processes, in which decisions over land use, LUCs, land access, and land tenure are made by various actors across scales and levels. This implies that actors can also interrelate over distance and thus be part of LUDM processes from at a distance. I argue that actors pursue their own agenda when interacting with each other and that they adhere to a certain set of (formal and/or informal) institutions. Figure 2 illustrates how I conceptualize LUDM. In my conception, LUDM encompasses *inputs* to the decision-making process as well as the *process* of decision-making itself, in which various actors interact. The *output* of LUDM is a particular land use or a change thereof (an LUC), possibly including a change in land tenure or access, and thus control over land.

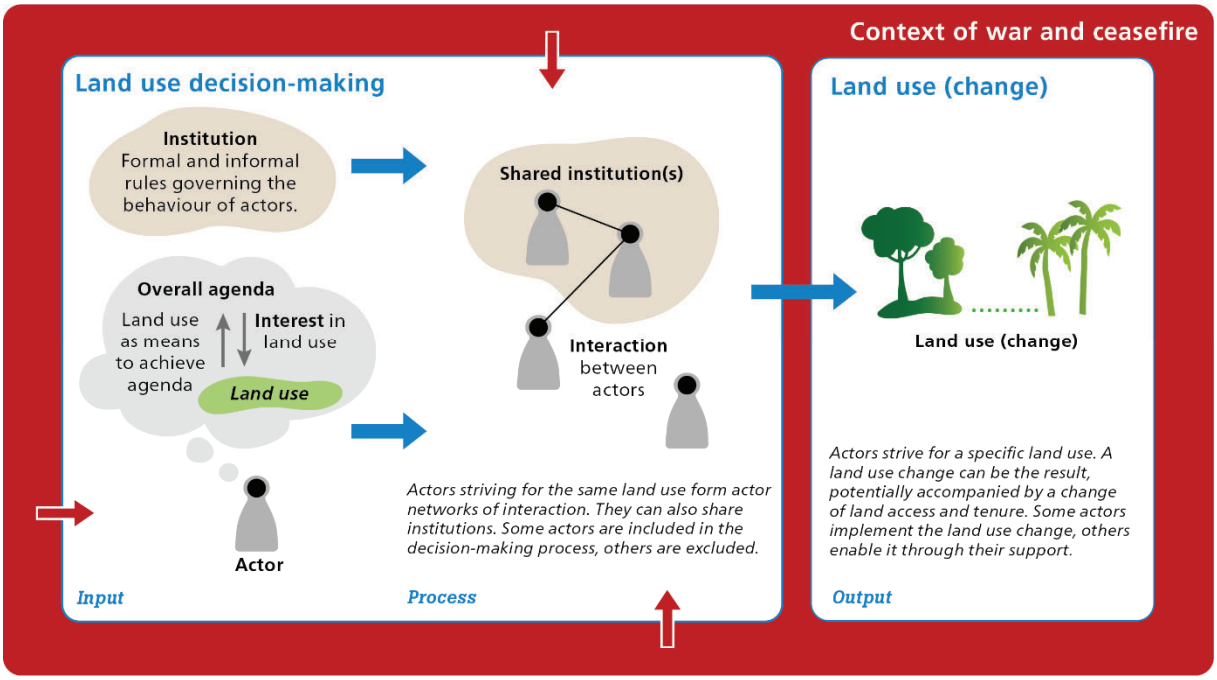

Figure 2: Conceptual framework of how land use decision-making leads to a particular land use or land use change, potentially including a change in land access and tenure (Lundsgaard-Hansen et al., 2021)

As *inputs* to LUDM (Figure 2, left side), two components are crucial: First, institutions can be formal such as written policies, laws, or land tenure rules; or they can be informal, such as traditional or customary rights (Biermann et al., 2009). Second, actors are guided by their own stakes when engaging in LUDM (Lundsgaard-Hansen et al., 2018; Wiesmann et al., 2011). We differentiate between an actor's overall agenda (broader goal in the context of war and/or the ceasefire period, e.g. survival), on the one hand, and the actor's specific interest in a particular land use (e.g. subsistence food production), on the other, which helps to achieve his or her overall agenda (see Figure 2). Each actor generally has one overall agenda, but several narrower interests in various land uses.

During the *process* of decision-making (see Figure 2), actors can form networks of interactions (Borgatti et al., 2013; Fischer et al., 2017), which we refer to as "actor networks" (see below). In particular, the actors may form alliances (Bassett & Gautier, 2014) and collaborate towards implementation of common LUC when they have a shared interest in the same potential land use. At the same time, actors may jointly adhere to one or more shared institutions. Conversely, actors may be excluded from the decision-making process by not interacting (or by being prevented from interacting) in particular actor networks, or by not sharing certain institutions. The actors relevant to LUDM, and thus potentially included in such networks, range from local farmers to international organizations; the relevant institutions range from informal customary systems to national statuary laws. Notably, the temporal and spatial occurrence of decision-making processes varies widely. Key processes may occur to large extent in a single meeting, or they may slowly evolve over several years.

The *output* of LUDM (Figure 2, right side) is the realization of the envisaged land use and potential LUC, which can include changes in land tenure or land access, and thus in control over land. In principle, an output of LUDM could also be a change of institutions or actors' agenda and interest. However, this was not at focus of the doctoral dissertation.

In addition, the *context* such as war or ceasefire – an important element of the Myanmar context – usually influences LUDM at any stage and time (Figure 2, red arrows) (Wiesmann et al., 2011).

Actor networks: actors, interrelations, and institutions

In order to generate an in-depth understanding of how LUDM can be characterized, the *process* of LUDM (see Figure 2) is further disentangled. To this end, the actor network approach – derived from the telecoupling lens – formed an integral part. An actor network approach is useful to disentangle networked arrangements among different actors of, for example, decision-making, policy-making, trade relations, or information exchange. Countless scholars have made contributions from and to various disciplines. In land governance, for example, for decision-making on future land uses, actors can form networks of interactions (Borgatti et al., 2013; Fischer et al., 2017), which I refer to as "actor networks". In particular, the actors may form alliances (Bassett & Gautier, 2014) and collaborate when they have a shared interest. At the same time, actors may jointly adhere to one or more shared institutions. Conversely, actors may be excluded from an actor network by not interacting (or by being prevented from interacting) with the members of the network, or by not sharing certain institutions.

The present dissertation focuses on three elements in the actor networks (also visible under *process* in Figure 2). First, the *actors* form the nodes of each network. Given the high importance of organizations or other forms of collectives (e.g. political parties, ministries and departments, companies, associations etc.) in land governance – particularly in terms of potential influence in LUDM – we chose to focus our analysis on collective and organizational actors (Fischer et al., 2017) rather than on individual people. For the farmers, we described them collectively as, for example, rubber farmers, betel nut farmers, landless casual labourers etc. Second, the *interrelations* between the actors represent their connection. The relations between the actors are to be analysed in terms of various flows such as exchange of goods, financial capital, human resources, and information (Bennett et al., 2012; Wiesmann et al., 2011). Third, formal and informal *institutions*, defined as rules governing the behaviour of actors, largely determine human–nature interactions (Biermann et al., 2009). For example, land reforms or declaring forests as protected areas alter how people use land and forests. In this way, institutions regulate territories and decision-making over their purpose (Sikor et al., 2013), and, thus, land governance. At the same time, actors can rely on, or even create, different institutions to achieve their aims.

Actor agency

To analyse actors' (re)actions in LUDM, we – the R4D research team – developed a conceptual and analytical framework to disentangle an actor's agency. The developed framework draws on the human actor model of Wiesmann et al. (2011), the understanding of action and agency of Eakin et al. (2014) and Seto and Reenberg (2014), and the concepts of capitals or means of Bennett et al. (2012), Wiesmann et al. (2011), and their sources. Figure 3 illustrates the basic features of the framework. An actor can interact with other actors in a network. Actors are embedded in an institutional context, which may be the same or different for the various actors. The institutional context influences their (re)actions. An actor's (re)action is a dynamic interplay of activities and the actor's agency. Agency is comprised of two interdependent variables: The actor's goal or interests give meaning to the (re)action, whereas material and immaterial resources constitute the means that an actor has to (re)act. A (re)action comprises a number of individual activities. Based on Wiesmann et al. (2011), Bennett et al. (2012), and their sources, we differentiate between (1) natural means; (2) human means; (3) physical means; (4) financial means; (5) social means; and later I also added (6) institutional means for the Myanmar research context. We characterised each of these means based on their distinct components.

I argue that also in the context of LUDM, an actor acts depending on its agency. First, the interests of the actor (meaning) influences how the actor wishes to (re)act. Second, the existing as well as potential means of the actor can determine to what extent the actor becomes active in – or inactive or excluded from – the LUDM actor network. In turn, interactions among actors can again alter the actors' agency (their means and meaning).

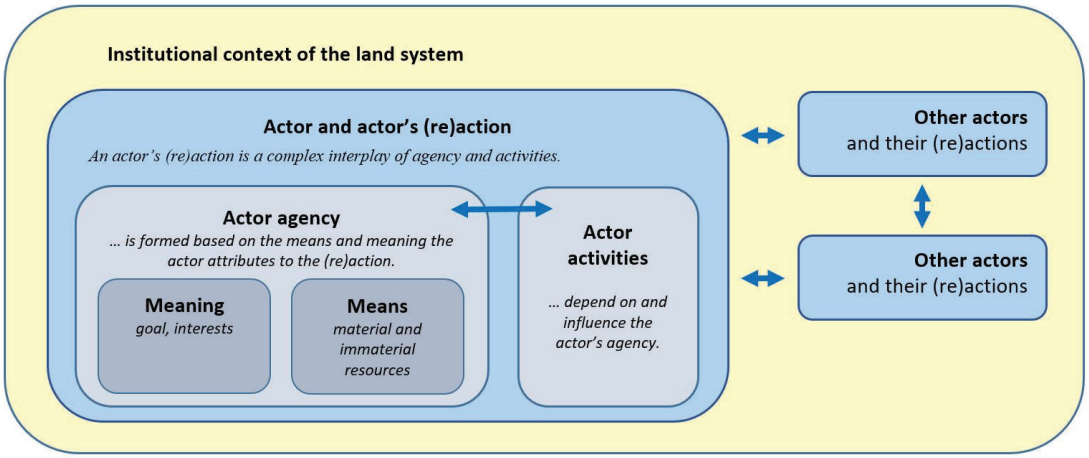

Figure 3: Actor (re)action framework: Actions and reactions of actors are understood as a complex interplay of their agency and activities. Actors' agency in turn is determined by the means and meanings they attribute to their (re)actions (Lundsgaard-Hansen et al., 2018)

Multi-stakeholder platform and social learning

As a central element of multi-stakeholder processes, MSPs are perceived as being a promising means to contributing to solutions for land- and natural resources-related conflicts (Faysse, 2006; Ratner et al., 2017; Sarmiento Barletti et al., 2020; Warner, 2006). Literature often refers to the definition of MSPs authored by Steins and Edwards, in which they define a platform as "*a negotiating and/or decision-making body (voluntary or statutory), comprising different stakeholders who perceive the same resource management problem, realize their interdependence in solving it, and come together to agree on action strategies for solving the problem*" (Steins & Edwards, 1999, p.244). MSPs may facilitate conflict resolution when they offer spaces to nurture common understanding and trust among stakeholders. They may enable stakeholders to negotiate potential solutions in a neutral setting, and, if effective, results may have broader ownership (Brouwer et al., 2016). A central element of MSPs is the collective learning among the multiple stakeholders, to strengthen knowledge creation and solution finding, and to increase common understanding, constructive relations, and trust among stakeholders (Cumming et al., 2012; Reed et al., 2010). Collective

learning, also widely referred to as social learning is commonly defined as follows: Social learning refers to learning by doing through experience in successful group processes. […] a process of social learning must *"(1) demonstrate that a change in understanding has taken place in the individuals involved; (2) demonstrate that this change goes beyond the individual and becomes situated within wider social units or communities of practice; and (3) occur through social interactions and processes between actors within a social network"* (Reed et al., 2010, online). Collective (or social) learning in multi-stakeholder processes has been argued to be crucial to transcend ordinary management or decision-making systems in favour of more sustainable development, as it can accelerate the changing of minds and support change agents and reformers (Chaffin et al., 2014; Claudia Pahl-Wostl, 2009; Folke et al., 2005; Pahl-Wostl et al., 2007; Rist et al., 2007).

However, these widely assumed merits of multi-stakeholder processes may be limited in contexts with strong power imbalances and long-standing, entrenched conflict histories such as in Myanmar in the 2010s, because they may undermine preconditions for MSP effectiveness, in particular the willingness and capability among stakeholders to engage cooperatively; and they may limit the potential to arrive at a shared problem framing and MSP goals (Pattberg & Widerberg, 2016).

3.2. Approach

A case study approach was adopted for this PhD study. The purpose of case-oriented research is to gain an in-depth understanding of a single case or a small number of cases in their real-world contexts, thereby using a range of different data sources and variables (Messerli et al., 2014; Yin, 2009).

For the research on generating a broad, yet in-depth understanding on LUDM, two villages as entry points were selected, according to contextual features pre-defined by the R4D project. The selection criteria for the case study sites were: (a) resource rich but poverty prone landscape, (b) various LUCs over the past 20 years, (c) mixed forest-agriculture landscape with a functioning ecosystem (not completely degraded), (d) presence of local population, if possible with different ethnic backgrounds, (e) exposure to external influence on LUDM, and (f) feasibility for the research team in terms of safety, permissions, data accessibility, willingness of villages to participate etc.

For the research on the MSP, the case study selection was not based on pre-defined selection criteria. The case study selection was grounded on the given opportunity provided by OMM Project to join the MSP in Tanintharyi Region, which offered this PhD study a unique access to and insight into an exceptional pilot case of multi-stakeholder learning processes.

Whenever possible, research for sustainable development should adopt a transdisciplinary approach, as the former needs to reflect the diversity, complexity and dynamics of existing problems, targeted solutions, and development pathways. To this end, research for sustainable development needs to take into account the knowledge, perceptions, values, and preferences of different people involved (Hirsch Hadorn et al., 2006; Lang et al., 2012). Accordingly, for this PhD study, engagement of a multitude of stakeholders in research (including non-academic stakeholders) was vital.

Overall, the doctoral dissertation applied a mainly qualitative methods approach.

3.3. Methods

Understanding of LUDM (first aim)

Overall, data collection lasted from April 2016 to May 2018. Most interactions were conducted in a Myanmar language (Burmese) in teamwork by the PhD candidate and members of the Myanmar research team; few were conducted in English. The interactions were digitally recorded if participants agreed. The names of respondents are kept anonymous to reduce the risk of repercussions given the current unpredictable political context (even though the respondents' contributions were usually not of political nature).

During a first exploratory field visit in 2016, our research team of three Swiss and four Myanmar researchers collected data in a joint effort in order to cover all work packages of the project. Jointly, we

developed and conducted 46 structured expert interviews (Flick et al., 2004) with residents and business representatives in 5 different sites (4 villages and 1 small town), as well as 2 focus group discussions (Bosco & Herman, 2010) in 2 villages (one each). The team reflection on this exploration phase made us realise that we had not yet found suitable villages for our case study according to the selection criteria of the project. In 2017, we visited the area again and the two project coordinators (one Swiss and one Myanmar researcher) visited several more villages to hold informal discussions with the village authorities. After these few additional days of exploration, we selected the two villages out of the many, of which we thought that they would best respond to the selection criteria. The village authorities of these two villages were approached for approval, as was the regional authority to grant a research permission for these villages (hereafter referred to as village A and B). These two villages were both located on a forest-frontier, had experienced deforestation and LUCs over the past 20-30 years, however interestingly, the LUCs differed and had to some extent different influential actors engaging in the LUCs, and the villages had different ethnicity and cultural backgrounds.

Knowing the case study villages, data collection followed three steps. In the first step, we facilitated workshops with focus group discussions in our two selected villages. In each village, we conducted two successive workshops. The first workshop served the purpose of identifying the main LUCs and understanding their development. In the discussions, we identified the main LUCs in and around the villages from the perspective of participants (see Table 1 for criteria for "main" LUCs). The spatial boundary was not precisely predetermined (e.g. administrative village boundary), but rather explicitly left open to enable local residents to interpret what they perceived as their village's surrounding[8]. We then collected very first data – during the focus group discussion – on the process of LUDM preceding each LUC (see Figure 2) by facilitating and recording a narrative dialogue about past events and by drawing causal loop diagrams. We did not predetermine the temporal starting point of analysis. Instead, the open narrative dialogue exercise revealed that all the main LUCs began occurring in the 1990s. This procedure of narrative dialogue served to establish a timeline of events for each LUC from its beginning and to identify the actors engaging in LUDM before, during, and after the LUCs had occurred. In the second workshop, we collected more details for each LUC. In particular, the relevant actors, informal and formal institutions, and flows of goods, financial capital, human resources, and information (interactions) were identified for (i) the land use before as well as (ii) the land use after the LUC.

In all workshops and focus groups, the participants were local residents (experienced farmers, elderly villagers, village heads, plantation workers), intentionally men and women alike, who represented different land uses. Prior to the workshop invitations, we always discussed with the village head and informed him about our envisaged selection approach of participants (to invite men and women alike, and to invite residents who would be experienced with one of the specific LUCs).

In Village A, the first workshop to identify the main LUCs was already conducted during the exploratory field visit in 2016. Eleven residents attended the workshop. In 2017, we made the second workshop in Village A, during which we divided the twelve participants into three specific focus groups depending on their expertise, each focus group discussing one specific LUC. In Village B, the first (28 participants) and second workshop (14 participants) both took place in 2017. The procedure for forming the groups was the same.

In the second step, my Myanmar research colleague and I conducted standardised *actor surveys*. The starting set were the old and new actors in LUDM as identified in the focus groups (from step one). From there, we applied a snowball sampling technique (Reed et al., 2009) to identify subsequent sets of actors from the first set of actors. We developed the survey in English and then translated it into Burmese. The survey included general information about the actor, its main activities, strategy (goal, development and ecosystem service priorities), resources, interactions with other actors (operationalized as flows of goods, financial capital, information, or human capital; based on Bennett et al., 2012; Wiesmann et al., 2011), as well as the formal and informal institutions to which the actor adhered. Where necessary, the standardised survey was on-the-spot expanded with some exploratory, qualitative questions for understanding the greater context of the actor's environment. The face-to-face *actor survey* sessions with respondents lasted

[8] Administrative village boundaries are not precisely known by local residents in the case study area.

50–150 minutes. To investigate relevant interactions (flows) and institutions more in detail, we additionally used a standardised *flows survey* and *institutions survey* respectively. For this purpose, we interviewed experts for these flows and institutions. Some of these experts were part of the network, others were not. All surveys were mainly conducted in Burmese and a few in English. Interviewees' responses about interactions and shared institutions were used to identify the next set of actors/respondents. We then repeated the snowball procedure with the newly identified actors in the evolving network from local to international level, ultimately conducting a total of 68 *actor surveys*, 18 *flows surveys* and 7 *institutions surveys*. Two aspects served to delimit the scope of the actor network and thus define the spatio-temporal boundaries of the system under study: Firstly, we applied relevancy criteria to data collection, as we explicitly chose not to predefine the boundaries of the actor network. In general, interactions (with the next actor) and institutions had to be directly or indirectly linked to and consequential for the LUCs under focus to qualify for inclusion (see Table 1 for relevancy criteria). Secondly, practical considerations such as finite time and money for travelling abroad placed limits on data collection, as did the lack of accessible data or respondents with respect to certain network actors (see Paper III on limitations to data collection and how we dealt with it).

Our third step involved filling in missing data on actors, interactions (flows), and institutions that were identified by the snowball procedure. Reasons for missing data were diverse, such as actors who did not respond to the survey, or did so only in part, as a result of lack of knowledge, refusal, or unavailability. In order to fill gaps in our data and address uncertainties and contradictions, we conducted qualitative semi-structured expert interviews (44 face-to-face, 7 by phone) with third parties[9] (see Appendix A in Paper III) in addition to consulting scientific and grey literature. For example, the surveyed rubber smallholders and traders were unable to name and explain the Myanmar state's influential economic and institutional incentives for rubber production. Thus, we conducted interviews with several rubber experts in Myanmar and studied additional literature to obtain data on these relevant institutions. See Paper III, Appendix A, for more detailed information on procedures and actors related to data gaps.

Even though Paper II and III both ground on the same procedure of data collection, the methods section of these two papers only describe the data collection methods relevant for the respective paper. Accordingly, there might be slight differences in the description of the data collection methods, for instance in the number of surveys (n), which were ultimately used for answering the respective research questions.

The present doctoral dissertation applied criteria of relevance for two elements: First, as elaborated above, the data collection started with identifying the main local LUCs in the case study villages, including the previous and the new land uses. The left column in Table 1 explains the relevance criteria for selecting an LUC as "main". Second, the boundary of the actor network (and therefore also of the snow-ball sampling) was not pre-defined but defined according to the following factors: Firstly, and most importantly, prior to the data collection phase, we applied criteria of relevance for the purpose of data collection (see Table 1). We decided to collect data along those flows only, which the respondents in the focus groups and surveys identified as relevant for their own direct and indirect involvement (or exclusion) in the respective LUC or land use. Similarly, we chose to investigate those institutions only, which respondents identified as relevant for the actors' direct and indirect involvement (or exclusion) in the respective LUC. Accordingly, we only considered those actors, which were attached to either a relevant flow or a relevant institution. The right column in Table 1 explains more in detail, how exactly the relevancy criteria for the network boundary and snow-ball sampling were defined and applied. Secondly, data collection was limited by practical aspects such as time and money constraints for travelling abroad, but also limited availability of data and respondents on certain network.

[9] "Expert" refers to individuals with extended knowledge of the core topics, for example, based on having lived in the area for a long time (e.g. elderly villagers) or having conducted relevant research or policy advising over several years (e.g. university professor).

Table 1: Relevance criteria for main land use change and network boundary

Element	**Criteria of relevance**
Relevant major land use changes (LUCs) in the villages (referred to as "main" LUCs as starting points)	The LUC must be "major and relevant" from the perspective of local residents. - "major": Spatial or temporal extent of the LUC. A major LUC must either encompass a relatively large surface (also possible as a considerable sum of small surfaces) or cover a relatively long time span of (re)occurrence. - "relevant": Intensity of consequences (positive or negative) of this LUC for the local population and environment.
Boundary of network and snow-ball sampling (via defining relevant flows and institutions)	When conducting the survey using the snow-ball sampling technique, we only followed the path to the next actor when the following criteria were fulfilled: - The respective flow or institution was linked to a participatorily defined major/relevant LUC in at least one of the case study villages. - The respective flow or institution had direct or indirect impact on the LUC and therefore had relevant impact on the local population and environment (from their perspective). - Flow: If one of the linked actors (surprisingly) rated a given interaction (flow) as particularly influential in a survey or workshop, the researchers were obliged to have a close look at it and reassess whether the criteria described above were met. Accordingly, there was no need for relevance criteria for actors. The study included all involved actors of the relevant flows, and excluded actors of non-relevant flows. For example, if a betel nut farmer indicated that most of the time, he/she sold the betel nuts to trader A and only rarely to trader B, the flow to trader A was followed and the flow to trader B ignored.

The data analysis methods varied depending on the research questions of the published papers. Kindly consult the research papers for further details on data analysis methods.

Multi-stakeholder process (second aim)

Paper V and especially Paper VI provide a complete description of the data collection and analysis methods applied by the PhD candidate for studying the MSP. Basically, the doctoral dissertation used participatory observation as well as qualitative interviews to this end.

4. Key insights from the papers

4.1. Overview of research papers

The table below presents the list of scientific papers produced within the scope of this doctoral thesis.

Table 2: Overview of peer-reviewed articles connected to this doctoral dissertation

	Title	Authors	Peer-reviewed journal	Status
I	The Cash Crop Boom in Southern Myanmar: Tracing Land Use Regime Shifts Through Participatory Mapping	Julie G. Zaehringer, **Lara M. Lundsgaard-Hansen**, Tun Tun Thein, Jorge C. Llopis, […][10], Win Myint, and Flurina Schneider	Ecosystems and People https://doi.org/10.1080/26395916.2019.1699164	Published (2020)
II	Whose Agency Counts in Land Use Decision-Making in Myanmar? A Comparative Analysis of Three Cases in Tanintharyi Region	**Lara M. Lundsgaard-Hansen**, Flurina Schneider, Julie G. Zaehringer, Christoph Oberlack, Win Myint, and Peter Messerli	Sustainability https://doi.org/10.3390/su10103823	Published (2018)
III	The Making of Land Use Decisions, War, and State	**Lara M. Lundsgaard-Hansen**, Florence Metz, Manuel Fischer, Flurina Schneider, Win Myint, and Peter Messerli	Land Use Science https://doi.org/10.1080/1747423X.2021.1961897	Published (2021)
IV	Sustainable Development Under Competing Claims on Land: Three Pathways Between Land-Use Changes, Ecosystem Services and Human Well-Being	Flurina Schneider, Mélanie Feurer, **Lara M. Lundsgaard-Hansen**, Win Myint, Cing Don Nuam, Katharina Nydegger, Christoph Oberlack, […], Julie G. Zaehringer, Aung Myin Tun, Peter Messerli	The European Journal of Development Research https://doi.org/10.1057/s41287-020-00268-x	Published (2020)
V	Assembling Drones, Activists and Oil Palms: Implications of a Multi-stakeholder Land Platform for State Formation in Myanmar	Stefan Bächtold, Joan Bastide, **Lara M. Lundsgaard-Hansen**	The European Journal of Development Research https://doi.org/10.1057/s41287-020-00267-y	Published (2020)
VI	The (In)Ability of a Multi-Stakeholder Platform to Address Land Conflicts – Lessons Learnt from an Oil Palm Landscape in Myanmar	**Lara M. Lundsgaard-Hansen**, Christoph Oberlack, Glenn Hunt, Flurina Schneider	Land (Special Issue "Oil Palm Landscapes") https://doi.org/10.3390/land11081348	Published (2022)[11]

[10] Some colleagues wished that their names would be removed from this dissertation due to the politically unpredictable context in Myanmar these days.

[11] At the time of PhD thesis submission, this paper was available as a "submittable draft". As a consequence of a sensitivity check of paper VI in 2021 and 2022, the published version was inserted into this dissertation after successful PhD defence and paper publication, in order to do no harm to research colleagues and participants.

4.2. Paper I: The cash crop boom in southern Myanmar

The overall Telecoupled Landscapes project's research endeavour started with analysing land use regime shifts in the case study area.[12] The research team around Julie Zaehringer applied methods of participatory mapping for identifying annual land uses between 1990 and 2017. The results show that land uses only changed marginally until the 1990s but then changed dynamically thereafter. The effect was a cash crop boom mainly at the expense of shifting cultivation for subsistence and forest.

Abstract Paper I

Tropical forest landscapes are undergoing vast transformations. Myanmar was long an exception to this trend – until recent policy reforms put economic development at the forefront. Under ambiguous land rights, commercial agriculture has spread rapidly, causing an unprecedented loss of biodiversity-rich forest. In south-eastern Myanmar, where land tenure is highly contested due to several decades of conflict, scientific evidence on these complex social-ecological processes is lacking. In the absence of past satellite data, we applied a participatory mapping approach and co-produced annual land use information with local land users between 1990 and 2017 for two case study landscapes. Results show that both landscapes have undergone a land use regime shift from small-scale farmers' shifting cultivation to plantations of rubber, betel nut, cashew, and oil palm. These changes are likely to have long-term impacts on land users' livelihoods and the environment. We call for a reconsideration of land governance arrangements and concerted land use planning that respects the rights of local land users and strengthens their role as environmental stewards. Applied with careful facilitation, participatory mapping could be an important tool to engage communities in the highly challenging process of transforming land governance to achieve more sustainable outcomes in this post-conflict context.

4.3. Paper II: Whose agency counts in land use decision-making in Myanmar?

The increasing LUC dynamics after the 1990s shown by Zähringer et al. (Paper I) already indicated that there might have been drastic changes in land governance, leading to altering LUDM. While the research team around Julie Zaehringer was approaching the land use regime from a spatial perspective, we then investigated the changes in land use from a perspective of land governance and LUDM (Paper II). We wanted to shed more light on questions such as what kind of actors contributed to the LUCs, what kind of interests and means they had etc. First, we identified the main LUCs from the perspective of the villagers, which were (op) conversion to oil palm monoculture, (nr) conversion to a protected nature reserve, and (ca) expansion of commercial agriculture such as rubber, betel, and cashew nut. Second, we identified involved actors for each of these main LUCs. Third, we investigated the agency of these actors, including the meaning (goal, interests) and means (material and immaterial resources) of these actors steering their actions in LUDM. The results show that uneven distribution of means can lead to unequal decision-making power, enabling high-means actors to become powerful and exclude those from LUDM with less means (in our case usually smallholders). Especially formal institutional means such as land use permits or titles (in contrast to customary tenure) seem to play an increasing role in Myanmar's context since the 1990s. Thus, the power in LUDM is often on the side of those actors, who have access to formal institutions or can interpret the formal institutions (laws, policies) in their own favour. This often holds true for members of Myanmar's elite. However, the results also illustrate that where interests among potentially competing actors are compatible or a mediator supports low-means actors in negotiations, actors are more likely to develop a

[12] Even though this paper was published later, the research and analysis on the land use regimes was done as an initial step.

collaboration despite unequal means. Under such circumstances, also smallholders have a chance to be included in LUDM.

In Paper II, we refer to LUCs as land use trajectories.

Abstract Paper II

Myanmar has experienced profound transformations of land use and land governance, often at the expense of smallholders. Empirical evidence on the agency of actors included and excluded in land use decision-making remains scarce. This study analyses who influences land use decision-making, how they do this, and under what circumstances smallholders are included. Comparing three land use trajectories in southern Myanmar, we analysed actors' agency—conceived as the meanings and means behind (re)actions—in land use decision-making using data from focus groups and interviews. Results showed that uneven distribution of means can lead to unequal decision-making power, enabling actors with more means to exclude those with less means: smallholders. However, this only applies in the case of top-down interventions with mutually exclusive actor interests regarding use of the same land. Where interests are compatible or a mediator supports smallholders in negotiations, actors are likely to develop a collaboration despite unequal means, leading to smallholders' inclusion in decision-making. Transformation of current land governance towards sustainable development could be promoted by providing mediators to actors with few means, ensuring equal access for all to formal land tenure, engaging with brokers in the land governance network, and improving access to knowledge and financial capital for actors with few means.

4.4. Paper III: The making of land use decisions, war, and state

The results of Paper II revealed that most of the powerful new land users in the case study area were somehow connected to the Myanmar government and its formal institutions. These insights made us wonder whether there was also a strategic intention of the Myanmar government to foster certain LUCs in the case study area. Further, from the research for Paper II and IV, we had heard several voices and had read several publications accusing the military-backed government of intentionally issuing large-scale land acquisitions in Tanintharyi Region for increasing its territorial control during civil war. We therefore decided to take a closer look at the same three main LUCs from a perspective of war-making and state-making, an analytical lens strongly influenced by Charles Tilly (Castañeda et al., 2017). The results show that all three LUCs did indeed contribute to war- and state-making by the Myanmar government, whether it was done intentionally or unintentionally. Through engaging in LUDM from a distance using alliances with actors, formal institutions, and incentives, the Myanmar government managed to increase its territorial control and its dominance in LUDM in the case study area. In contrast, the KNU, the rival of the Myanmar government at that time, lost influence in LUDM and territorial control.

Abstract Paper III

During a civil war and its aftermath, rival powerholders frequently engage in decision-making over land use, for example via land acquisitions or legal reforms. This paper explores how powerholders influence land use decision-making and what their engagement implies for territorial control. We analyse three cases of land use changes in Myanmar's south between 1990 and 2015, where the Myanmar state and an ethnic minority organization fought over territorial control. We gathered qualitative data with a mix of methods and visualised actor networks and institutions. Our analysis reveals that the state managed to increasingly control decision-making over local land use from a distance by employing actor alliances and institutions such as laws and incentives, whereas the ethnic organization lost influence. We conclude that engaging in land use decision-making plays a crucial role in influencing the outcomes of a civil war and that it represents a form of war- and state-making.

4.5. Paper IV: Sustainable development under competing claims on land

Paper VI provides a synthesis of the research conducted in the case study villages, combining several work packages from the Telecoupled Landscapes project. It focuses on the time until 2015, hence, does not yet include the civil government period of 2016-2020. Among other interesting insights, the paper authored by Flurina Schneider et al. contributes to an in-depth understanding of how LUCs and LUDM impact the natural environment and the human well-being in the case study area. The study disentangles again the same three main LUCs.

Abstract Paper IV

Competition over land is at the core of many sustainable development challenges in Myanmar: villagers, companies, governments, ethnic minority groups, civil society organizations and non-governmental organizations from local to the international level claim access to and decision-making power over the use of land. Therefore, this article investigates the actor interactions influencing land-use changes and their impacts on the supply of ecosystem services and human well-being. We utilise a transdisciplinary mixed-methods approach and the analytical lens of the social-ecological systems framework. Results reveal that the links between land-use changes, ecosystem services and human well-being are multifaceted; For example ecosystem services can decline, while human well-being increases. We explain this finding through three different pathways to impact (changes in the resource systems, the governance systems or the broader social, economic and political context). We conclude with implications of these results for future sustainable land governance.

4.6. Paper V: Assembling drones, activists and oil palms

While Paper I-IV contribute to the first aim of the doctoral dissertation of providing a broad, yet in-depth understanding of LUDM in southern Myanmar, Paper V and VI contribute to the second aim. By analysing an MSP from the civil government period (2016-2020), the dissertation aims at investigating the transformation potential of multi-stakeholder processes for more inclusive LUDM in Myanmar. Oil palm concessions are a dominant cause for land conflicts in Tanintharyi Region. The LUDM processes around these concessions, which were mainly implemented in the 1990s and 2000s, was far from being inclusive. As Paper I-IV show, even in our case study area, an oil palm concession caused entrenched land conflicts, an exclusion of smallholders from LUDM, decreasing ecosystem services, and a deterioration of the local population's human well-being.

In 2016, an MSP in Tanintharyi Region was launched by the regional government in order to address land conflicts in relation to oil palm concessions. Representatives from the government ministries and departments, oil palm companies, CSOs, and the ethnic political organizations were invited. An international project supported the MSP from a technical perspective, providing facilitation during the MSP meetings and conducting and supporting concession mapping activities. My Myanmar research colleague (anonymous) and I accompanied the MSP from a research perspective. At some points, other Swiss research colleagues also joined the investigations connected to the MSP (such as Stefan Bächtold for Paper V and Christoph Oberlack for Paper VI). The first few months of the MSP appeared rather promising. Unfortunately, challenges arose over the months to come. The MSP was first active for almost one year, before it became dormant due to various reasons. In 2019 and 2020 it became evident that the MSP had collapsed without ever being formally closed.

The research conducted for Paper V took place while the MSP was still existing. At the time of paper submission, the MSP was dormant, but it was still unclear whether the MSP could be revived or whether it would collapse totally. Paper V takes a closer look at the MSP from a perspective of power, assemblage thinking, and aspects of state formation. The paper argues that the MSP – probably unintentionally – served to expand the power of the Myanmar government into the still contested borderlands of Myanmar such as Tanintharyi Region. One major mechanism of power expansion through the MSP was observed by the 'forging of alignments' among the MSP participants. This implies that, by joining the MSP under the leadership of the regional government, the participants legitimised the way how the regional government would address the land issues around oil palm concessions – at the expense of how, for instance, the KNU would address the same land issues. The MSP opened space for the voicing of less-influential actors, but it equally reproduced certain power structures. These results (produced in 2018-2019) indicate that there still remained the tendency that LUDM continued to lack a true inclusion.

Abstract Paper V

Amid Myanmar's political transition and despite its new government's discourse of inclusion and dialogue, land conflicts have increased across the country's ethnic minority areas. We argue that land plays a central role in the complex interplay of state formation, armed conflict and international development in Myanmar's contested borderlands and that land conflicts can provide an entry point to make sense of these dynamics. We use ethnographic data and a framework combining Deleuze and Guattari's concept of assemblages with Foucault's conception of power to provide a detailed analysis of a multi-stakeholder platform (MSP) addressing land disputes in Myanmar's south-east. Analysing the platform's discourses, practices and technologies, we argue that, despite its emphasis on inclusion, participation and dialogue, it is the operation of power that upholds this inherently conflictive assemblage. The platform opens spaces for agency for less-influential actors, but it equally produces de-politicising and exclusive effects. While scholars have typically used assemblage thinking to analyse how state authority is disassembled by the growing role of non-state actors, we aim to further post-structural reflections on state formation and international development by arguing that the central state in Myanmar actually expands its reach into the borderlands through assemblages such as the MSP. This happens at the expense of the authority of quasi-state formations of ethnic armed organizations. Thus, this process is reminiscent of how the Burmese state expanded its reach through assemblages of land and resource extraction during the 'ceasefire capitalism' before the transition.

4.7. Paper VI: The (in)ability of a multi-stakeholder platform to address land conflicts[13]

Paper VI analyses the same MSP as Paper V. At the time of paper writing, however, it was already clear that the MSP had collapsed entirely in the meantime. Being able to revisit the entire process of the MSP from its beginning until its falling apart made it possible to look at the MSP from the perspective of the MSP's potential to contribute to a more inclusive LUDM. In particular, we investigated the effectiveness of the MSP as it aimed at (inclusively) addressing land conflicts around oil palm concessions. We also studied the promising and hindering factors for the MSP to be (in)effective.

The results show that, unfortunately, the MSP was only partly effective. The study identifies several promising factors of the MSP for being effective such as a thorough situation and conflict analysis prior to the MSP launch, adequate inclusion of stakeholders, secured funds, or effective facilitation. However, the analysis also reveals hindering factors such as lack of clear mandate of the MSP, limited information and communication, or lack of legal and land governance expertise. Further, the study also shows that the circumstances for designing and governing an effective MSP were not favourable. Especially the challenging circumstances illustrate that the transformation potential of this MSP to make LUDM more inclusive was still limited in the pre-coup land governance system, among other things also due to reinforced power disparities and intransparent land governance mechanisms.

Paper VI provides a detailed analysis of the design and governance of the MSP and its effectiveness in addressing land conflicts. It further discusses promising as well as hindering factors of the MSP and whether MSPs are a suitable approach in a context of longstanding conflict histories and power disparities. The paper concludes with recommendations for other MSPs in similar settings.

Abstract Paper VI

Oil palm landscapes are often characterized by land conflicts. Multi-stakeholder platforms (MSP) may be a promising means to contributing to conflict resolution. However, the merits of MSPs are limited in contexts with strong power imbalances and entrenched conflict histories. This study analyses an MSP from Myanmar. We developed an analytical framework based on literature on MSPs and social learning and used qualitative methods such as participatory observation and interviews. The study investigates how the MSP was designed and governed and whether it was effective in addressing the land conflicts around oil palm concessions. The study discusses several promising factors of the MSP for being effective such as adequate inclusion of stakeholders, secured resources, or effective facilitation. However, the analysis also reveals how hindering factors such as lack of clear mandate, goal, and decision-making competences of the MSP, insufficient communication, or lack of legal and land governance expertise contributed to only limited effectiveness of the MSP. Further, we discuss whether the MSP was a suitable approach in the given context of intransparent land governance mechanisms, persisting power disparities, and longstanding conflict history. We conclude that designing and governing an MSP in such a context needs to be done very cautiously – if at all – and recommend to pay special attention to ten specific points.

[13] This section 4.7. was updated in 2023 after successful paper publication.

5. Synthesis and outlook

Since the research predates the military coup of 2021, the synthesis focuses on the time until 2020. In the outlook, I formulate some interpretations of how Myanmar's future land governance and LUDM could look like, based on what I have learnt from looking at the past and present.

5.1. Importance of institutions in Myanmar's land use decision-making

In Paper II, a comparison of all LUCs showed that institutional means were relevant in enabling actors to become decisive land use decision-makers, especially through obtaining formal land titles. Until the early 2010s, most smallholders relied mainly on their informal customary system. Accordingly, in LUC_{op} and for a long time in LUC_{nr}, smallholders did not own or have access to formal land titles issued by the government, whereas the new incoming actors held formal permissions or a mandate from the central (and partly regional) government. In LUC_{op}, the military company used its concession to claim decision-making power over the land under concession, while the smallholders had no formal certificate to prove the rightfulness of their land use and tenure; even worse, their activities were formally illegal according to Reserved Forest regulations, even though these regulations had never been strictly enforced (see Paper II and III). In LUC_{nr}, the semi-governmental conservation organization received a mandate from the central Department of Forestry to implement the nature reserve. This official mandate legitimised their appropriation of decision-making power over the designated forest, whereas in this case, too, the smallholders had no formal recognition of their use of the nearby forest to support their claim to being included in decision-making. Thus, in LUC_{op} and for a long time in LUC_{nr}, smallholders were excluded from LUDM because new actors brought high-level formal institutions into a customary system. Much later in LUC_{nr}, the very same smallholders who had been excluded regained access to LUDM on the same forest by formally registering as a Community Forestry (CF) group and receiving a formal CF land use certificate. However, the CF group needed to comply with the national-level instructions for CF and nature reserve regulations. Hence, in all these situations, formal institutional means such as land titles—unlike informal, customary institutional means—were critical for actors to be included in or to dominate LUDM. As confirmed by several interview partners, the higher the level of the government authority issuing a land title, certificate, or mandate, the more power it gives its owner in the previous and current legal system. I thus conclude that formal institutions can be strikingly powerful, even if a large share of a population does not support or adhere to them. If the formal institutions intrude a customary system, the institutions' implementation and enforcement depends on whether the actors, who come with it, are powerful themselves and whether they have an interest in and little risks when enforcing them. As seen in Myanmar, the top leadership of the political regimes and their allies created and enforced laws and policies, which were in favour of the elite and delegitimized customary systems.

Moreover, in Paper II and III, I observed that even institutional (and economic) incentives created by the central state were powerful for steering LUCs on the ground. For instance in LUC_{ca}, the rubber boosting policies in the 2000s as well as the land-related reforms (pushing for land formalization) in the early 2010s resulted in many actors joining the expansion of commercial agriculture at the expense of subsistence agriculture. Thus, my second conclusion on institutions is that institutional incentives offering land tenure security are widely adopted by the powerless due to their fear of losing their claim on land otherwise. Hence, combining institutional incentives with strategically causing fear can be a very effective means of the powerful to steer LUDM according to their interests.

5.2. Telecoupling revisited: Role of distance in Myanmar's land use decision-making

For analysing the actor network data of the present doctoral dissertation (Paper II and III), the understanding of the term telecoupling as suggested by Eakin et al. (2017) proved to be useful. Eakin et al. differentiate between three types of distance, which I applied as follows:

- *Physical*: Actors are located in geographically distinct natural resources systems.
- *Social*: There is a lack of interaction between two or more actors.
- *Institutional*: Actors lack a shared system of governance and institutions. Thus, the actors don't adhere to the same set of institutions.

This understanding of Eakin et al. (2017) can shed light on less conspicuous and more complex forms of telecoupling. The commonly investigated forms of telecoupling are usually related to the physical distance, whereby interrelating actors are bridging different places. Through the analysis of the social and institutional distance, however, investigations can additionally reveal connections across scales. Thus, using the telecoupling lens suggested by Eakin et al. (2017) allows to better integrate cross-scale interactions.

In my case study, in the initial situation before any LUCs happened (until the 1990s), neither Karen people in Village A, nor Bamar (Burmese) people in Village B – all of them smallholders adhering to a customary land use system – were in close connection with the Myanmar state or local authorities thereof. The state was physically, socially and institutionally very distant from the case study villages due to lack of safety for its governmental staff. The KNU – the then rival of the Myanmar state – was in close connection with their ethnic people in Village A. Unsurprisingly, the territorial control of the Myanmar state in the case study area was very limited until the early 1990s, while the KNU's territorial control was somewhat stronger. Accordingly, the Myanmar state's land-related institutions were far from being relevant for the smallholders in the local context.

Throughout the 1990s, 2000s, and 2010s, distant actors entered the local context and considerably contributed to the LUCs. At first, the Myanmar state remained physically, socially and institutionally distant to the smallholders in both villages. Instead, the Myanmar state created alliances with and incentives for other actors to implement certain LUCs (military company in LUC_{op}, conservation organization and international oil and gas companies in LUC_{nr}, private sector actors in LUC_{ca}). These new actors would physically enter the local context and carry the state's institutions there.[14]

We observed that most of the new actors entering the local context were also physically, socially, and institutionally distant to the smallholders before the LUCs commenced. With LUC_{op}, the military company, having its headquarter in the distant economic capital Yangon, became physically proximate to the initial land users, however, never achieved a social proximity nor institutional proximity, as the smallholders and the company didn't share any contacts, nor interests or institutions. Also in LUC_{nr}, only with the operationalisation of the nature reserve post-war, the conservation organization could reduce its physical distance to the smallholders (by opening offices in various villages such as Village B) and social distance (by conducting awareness raising, trainings, hiring local staff etc.). The organization even achieved to reduce the institutional distance step-by-step until the late 2010s by convincing most of the smallholders to follow the conservation guidelines in the nearby area of the nature reserve as well as by jointly agreeing on a CF area for the villagers. The international oil and gas companies, important enablers of LUC_{nr} (providing the financial capital), also newly entered the case study area during civil war. Thus, they became physically proximate to Village B, however, remained socially and institutionally distant from smallholders. The companies relied on the institutions by the Myanmar state and did not enter any relevant material or immaterial exchange with Village B.

In LUC_{ca}, the characteristics of distance and proximity of actors were different from the other two LUCs. Also in this case, at first, the new incoming actors (private agribusiness and land speculators) were physically and socially distant to the smallholders. However, the private agribusiness as well as the land

[14] Only after the fighting stopped in 2011, representatives of the Myanmar state – governmental staff – physically entered the case study area and even managed to reduce its social and institutional distance to the smallholders in the case of LUC_{ca} (t_{ca3}), where smallholders started to interact with the state for taxing and land titling.

speculators were both regional actors. Thus, they were familiar with the smallholders' customary systems and some even had relatives in Villages A and B. By acquiring land in the villages and planting cash crops, the two actors became physically proximate. They also partly became socially proximate, where they hired local smallholders as casual labourers or exchanged other material and immaterial resources (some did, others didn't). Regarding the institutional distance, we observed an interesting mixture of distance and proximity. Both new actors (agribusiness and speculators) respected the local customary system (were thus institutionally proximate), while also adhering to institutions created by the Myanmar central state such as development programmes for industrial crops (economic incentives) and land reforms offering land titles (institutional and economic incentives) leading to a land formalization rush as a form of investment and tenure security. Interestingly, LUC_{ca} was the one with the fewest inter-actor tensions. The main reason for the absence of major tensions might be that this was not a top-down directive LUC. It allowed for a physical, social, and institutional proximity of the incoming land use changers as well as the fact that the smallholders themselves also joined LUC_{ca}.

Taking a comparative look at the three types of distance, it seemed that they played various roles for implementing an LUC in Myanmar. In the two rather top-down directive LUCs (LUC_{op} and LUC_{nr}), the allies of the Myanmar state[15], who implemented or enabled the LUCs, were initially physically, socially, and institutionally distant actors from the smallholders. By entering the local context, the new actors reduced their physical distance, but not necessarily the social and institutional distance. Overcoming the social and institutional distance to the smallholders was not relevant; on the contrary, especially the institutional distance proved useful to enforce the LUC at the expense of the smallholders' land use claims. In the incentive-based LUC_{ca}, the new actors (agribusiness and land speculators) were also socially and institutionally better connected to the smallholders, besides becoming physically proximate in course of the LUC. We thus conclude that when also social and institutional proximity could be achieved, collaboration between the actors for a certain LUC improved and inter-actor tensions were less common.

There remains, however, a need for further research from other contexts (outside Myanmar) before one can draw general conclusions on the relevance of the three types of distance for LUDM.

5.3. How powerful actors shape land use decision-making in Myanmar

All research papers connected to this doctoral dissertation contributed to shed light on how powerful actors shape LUDM in Myanmar. In this section, I would like to highlight and synthesise the main results for this point.

Paper II reveals that *uneven distribution of means* (resources such as goods, financial and human capital, information, and formal land titles) between actors generally leads to unequal LUDM power. Overall, actors with more means can exclude those with fewer means from LUDM. In the investigated context, the high-means actors usually belong to the elite of Myanmar, while the low-means actors are predominantly smallholders in a customary land management system.

Further, having access to *formal institutions* – such as land titles or laws and policies – and being able to interpret the formal institutions according to the interest of the actor, strengthen the actor's power in LUDM. This is an important condition in the context of Myanmar's opaque legal pluralism. Paper II and II both show that smallholders often are disadvantaged in this regard, as they were lacking access to formal institutions for many decades (some until today) and they are often not able to interpret the formal institutions in their own favour due to lack of knowledge or other reasons. At the same time, the elite of Myanmar, many of them with links to the Myanmar military, have both – the access to the formal institutions and the ability to interpret them in the elite's favour (see section 5.1.).

Various research results also show that the ability of an actor to *forge alliances with other actors* can strengthen its position in LUDM – even if these alliances exist over long distance. As presented in Paper III, in LUC_{op} and LUC_{nr}, for example, the Myanmar government managed to crucially shape LUDM on the ground

[15] Military company in LUC_{op}, conservation organization and oil and gas companies in LUC_{nr}, and the Myanmar military in both LUCs

thanks to its allies, who entered the local context with a government mandate. Paper II also supports this argument by showing how Village B managed to regain access to forest use (for subsistence) by entering a collaboration with an international non-governmental organization, who would provide them access to a formal CF certificate.

Paper II and III both show that the ability of an actor to provide *economic and institutional incentives* to other actors can also serve as a means to increase its power in LUDM. It is probably a less obvious way of influencing LUDM. In the case of LUC_{ca}, the Myanmar government expanded its influence on local LUDM by incentivizing a variety of local actors (agribusiness, land speculators, smallholders) to collaborate with the Myanmar state and join the implementation of certain LUCs. Especially through the land formalization reform (institutional incentives, providing access to land tenure), the Myanmar government initiated a legitimization of its power and authority, since most actors joined the land formalization rush.

More broadly speaking, actors can also strengthen their power in LUDM by dominating debates, knowledge creation and sharing, defining rules etc., thus, by *shaping the societal discourse* of what is the 'truth'. This understanding of power expansion also responds to Foucault's conception of power (Foucault, 2004). The previous arguments of providing formal institutions and incentives etc. also go into this direction. As illustrated in Paper V and VI, another means of strengthening an actor's influence on discourse-shaping is through its dominance in multi-stakeholder processes. One major mechanism of power expansion through the MSP was observed by the forging of alignments among the MSP participants. This implies that, by joining the MSP under the leadership of the regional government, the participants legitimise the way how the regional government would address land issues – at the expense of how, for instance, the KNU would address the same land issues.

Overall, I argue that if high-means actors form a network and join forces in Myanmar, they can completely dominate other actors in local LUDM, especially because poorly networked, low-means actors also generally lack institutions to back them up. Seemingly, such strong and high-means actor networks also tend to dominate the societal discourse of what is the truth.

5.4. Personal reflection: How power and tradition persist in Myanmar's land governance

Most research papers connected to this doctoral dissertation as well as other literature on Myanmar illustrate that the political and economic top-elite of Myanmar consisted – and continues to consist – of mainly military actors as well as military-friendly actors. The research results also show that these elites were and are usually powerful in land governance by, for example, creating and enforcing formal institutions favouring the powerful, influencing LUDM and pushing for LUCs on the ground according to their own agenda and interests. This brings raise to the question whether the top-elite had and has an interest in transforming land governance towards more inclusion in decision-making.

The top-elite created and enforced a legal and economic order, which is in favour of the elite, making it possible for them to further accumulate wealth and power, while increasing the disparities to the general population. Being privileged, the top-elite has certainly low interest in changing the system, law, and order. Any risk of change will be prevented or eliminated. In order to maintain its power for decades, the military regimes (1962-2010) used the creation of fear, repressive as well as non-repressive instruments, and warfare instruments such as political imprisonment, surveillance, persecution, censorship, strategically setting ethnic armed organizations at each other, strategic composition of political and economic positions and courts etc. After 2010, the instruments became a bit less repressive and war-oriented, however, the military managed to remain in control and power through other instruments. The shift to the quasi-civilian reform period (2011-2015) was highly controlled by the military. The new legal and economic reforms were still in favour of the elites, which were very well connected among themselves. Further, during the civil government period (2016-2020), the military also remained in control by, for example, keeping the 25% seats in parliament, continuing to control several key ministries, or keeping the right to issuing a "state of emergency" and resizing power. This short historical sketch illustrates that the top-elite managed to remain in power (obviously or hidden) through various instruments and had little interest in supporting any changes (or opportunities thereof), which would compromise their privileges, wealth, and power.

I wonder whether there is also more to it than purely economic and power interests of the top-elite. Approaching their behaviour from a more psychological perspective, I argue that one could also see fear of uncertainty as one of the reasons for the top-elite's behaviour. Firstly, holding on to "what one knows" can provide security. Elements of "what one knows" can be manifold, e.g. traditional hierarchies, a state of civil war, being needed as a decision-maker in warfare, wealth. Losing these habits or life conditions can provoke personal uncertainty, insecurity, and thus fear. Secondly, top-leaders can develop a need for admiration. If the status of admiration and unconditional respect decreases, this might lead to strong personal discomfort and fear, too; a condition the top-leader aims at changing. If these interpretations from a psychological perspective were to be true, these points would add to the argumentation that the economic and political top-elite of Myanmar has little interest in changing the old system including land governance.

Paradoxically, in terms of socio-cultural tradition, also actors without any relations to the top-elite seem to carry on the traditional norms and values. As an outsider and woman, I would attribute the following keywords to Myanmar's tradition (based on my observations and literature): respect of and for seniority and authority, masculism, loyalty and non-criticism, pride, hospitality, ethnicism. I argue that it is difficult to break with tradition if firstly tradition is not widely contested and secondly the powerful do adhere to this tradition themselves. In the multi-stakeholder process described in Paper VI, for example, even the opponents of the oil palm concessions adhered to respecting senior and high-ranking government officials and not publicly formulating strong criticism against them. In the villages we also experienced that the smallholders felt subordinated and non-legitimized to communicate with economically or politically better-situated actors. This was especially the case for women and youth. These and more examples illustrate that mainly men – often Burmese men – with seniority and/or a high economic or political position steered and continue to steer land governance as well as LUDM. These senior men were rather uncontested over decades and might have had little interest in changing the traditional system. Hence, through being traditionally powerful, there was no hindrance for them to continuing this tradition (while keeping their privileges and sticking to "what one knows"). This indicates how socio-cultural tradition persisted in land governance for decades. During the quasi-civilian reform period and civil government period (overall 2011-2020), the young urban population of Myanmar started to move towards a socio-cultural transition of the society, questioning the traditional norms and values. However, this movement might come to an end (or be forced to go underground) through the military coup 2021.

5.5. Outlook

Given the present political crisis in Myanmar, it is quite challenging to formulate an outlook, as the country is currently far from providing a stable political environment. Currently, I see three possible scenarios of how the political situation could develop, each with different implications on land governance and LUDM.

In the first scenario, the armed fighting continues for years or decades, while none of the potential powerholders dominates the opponent(s) – neither the military nor the opposition government (currently in exile) or any other ethnic, civil, or political organization. In this scenario, the population is very likely to experience a major humanitarian crisis with lots of insecurity, instability, poverty, health and food issues, and an almost total lack of education for children. Regarding land governance, this might imply that LUDM becomes (again) highly unpredictable in the absence of law and order. Powerful actors might (again) misuse their power vis-à-vis the powerless and acquire land wherever they please and wherever the respective local powerholder(s) – for purposes of war-making and/or personal profit – strategically support(s) such land acquisitions. The population in the war zones will again be forced to abandon their lands for reasons of personal safety. In case of lacking land titles – as this is often the case in ethnic borderlands – these people will again face tremendous difficulties when returning home after the end of armed fighting and reclaiming "their" land. In the more peaceful areas, the population might also not be able to update their land tenure realities as the governmental body could collapse and not provide the necessary services (e.g. issuing or transferring land titles). Moreover, also comparably powerless actors in LUDM could take advantage of the absence of law and order and, for example, encroach unguarded or abandoned plantations, clear forest for expansion of agricultural land, or contribute to selected logging in intact forests.

In the second scenario, the military dominates the opponents (maybe with some allies among ethnic political organizations and pro-military civil defence organizations). The political environment will become stable to some extent (while armed fighting might continue in various places). In this scenario, it seems unlikely that the so-far powerful actors (top-elite and traditionally influential senior men) have an interest in transforming LUDM and land governance towards more inclusion and sustainability. Most likely, they will continue to formulate or stick to land-related laws and policies, which do not endanger the privileges of the already powerful. The powerful actors might also continue to secure further profits from natural resources depletion, such as extending the oil palm concessions or further engaging in logging and mining. This would imply a return to top-down land use decision-making and interventions without free prior informed consent from local communities. Thus, less powerful actors would be excluded from land use decision-making in many instances. However, it is also possible that the powerholders will make some compromise in order to pacify the population and prevent other major armed and non-armed resistance. As far as I can tell, the current resistance from within the Myanmar population with the countless anti-military, unarmed as well as armed (partly underground) movements is a (for Myanmar) unprecedentedly strong and continuous resistance from within the civilian population. Moreover, the military is more under observation and pressure from foreign countries and strong multilateral organizations (such as the ASEAN and UN) than it has been until 2010. These factors might motivate the military to accept the before mentioned compromise in various ways, such as in land governance. For example, in order to pacify the various ethnic armed and political organizations, the military would probably need to recognize and formalize the customary systems of the ethnic population and guarantee a save return of the refugees to their previously used lands. A further instrument might be public or semi-public consultation processes for addressing land conflicts or reforming land-related laws, for example. According to this logic, paradoxically, the potential of a transformation of land governance towards more inclusion might be quite high, even though the so-far powerful actors would remain in power.

In the third scenario, the opposition government (in exile) and the strongest ethnic political organizations join forces and push the senior military generals into exile or imprisonment. The political environment will become stable to some extent, however, it might take several years until the new government structures would be clear, reforms would be approved, and a new political order would be manifested. In this scenario, the chances for a transformation of land governance towards more inclusion might also be high, albeit probably slow. Surely, the ethnic political organizations would only collaborate with the opposition government if the latter made considerable concessions to strongly include the ethnic political organizations in all future decision-making processes and structures. Accordingly, it could be expected that at least the inclusion of ethnic minorities in LUDM and land governance would be considerably improved. However, as we have seen above, it is not entirely clear whether also the traditional norms and values of seniority, authority, masculinity etc. would change considerably under a new governmental composition. For example, it remains unclear whether also the voices of women, younger generations, and the population with lower economic and political status would be heard in land governance.

With this outlook, I would like to appeal to the scientific as well as to the development and peace-building community, private sector, and states to further engage for conflict resolution and durable peace in Myanmar. Regarding LUCs, LUDM, and land governance in Myanmar, for example, the following actions could be undertaken:

- Monitor and document major LUCs, which are either large in surface or often in occurrence. This should include monitoring and documenting eventual changes in land tenure and identifying the main actors. For example, there might be mosaicked LUCs typical for war zones such as destruction of natural environments due to heavy artillery or troop movements, displacements, abandonment of villages and agricultural land, small-scale illegal logging etc. But there might also be LUCs typical for power misuse in times of absence of law and order or absence of local land users, such as large-scale land acquisitions for various purposes (troop camps, agriculture, energy etc.) or systematic illegal logging.

- Monitor and document changes in land governance and their impacts on different actor groups, such as new land-related laws and policies, new governmental development programmes etc.
- Monitor and document human and other rights violations in connection to land use (investments), land access, land tenure etc. For example, the right to food, right to peasantry, land rights of women, or right to shelter could be relevant.
- Further investigate the existing and new economic and political telecoupled actor networks of the warrying parties. For example, there might be banks, companies, or politicians from outside Myanmar, who collaborate with the warrying parties. However, also domestic actor networks of the warrying parties need to be disentangled.
- Support and protect land right defenders or special rapporteurs.

All of these actions could contribute to durable peace in Myanmar via various pathways. First, evidence on what exactly warrying parties are doing, who their partners are, and what kind of rights violations or power misuse they conduct, all this could make international sanctions more targeted. This holds true for every sector, including the land-based investment sector such as oil palm, rubber, extractive industries, special economic zones etc. Second, such evidence could support foreign governments, multilateral organizations (e.g. ASEAN, UN), or other pro-peace actors to put pressure on the warrying parties in Myanmar to enter peace dialogues. Third, in case of re-established peace, warrying parties, who conducted severe human rights violations, can be brought to court thanks to evidence collected. Forth, evidence covering the above mentioned points would be much needed for post-war peace processes, as soon as ceasefires have been implemented and the country would enter peace-building. Local and national peace processes need to address land conflicts in order to ensure durable peace. This includes, for example, negotiations of land-related legal reforms at national and regional level, land use and tenure re-negotiations at local level, bringing land titles up to date, and guaranteeing a safe return of refugees to their original villages and plantations.

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PART II – The Research Papers

Paper I: The cash crop boom in southern Myanmar

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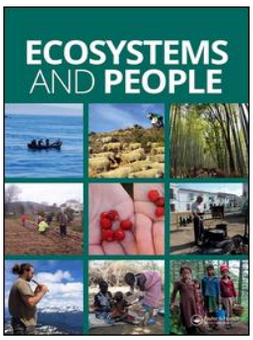

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The cash crop boom in southern Myanmar: tracing land use regime shifts through participatory mapping

Julie G. Zaehringer, Lara Lundsgaard-Hansen, Tun Tun Thein, Jorge C. Llopis, [...], Win Myint & Flurina Schneider

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The cash crop boom in southern Myanmar: tracing land use regime shifts through participatory mapping

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ABSTRACT

Tropical forest landscapes are undergoing vast transformations. Myanmar was long an exception to this trend – until recent policy reforms put economic development at the forefront. Under ambiguous land rights, commercial agriculture has spread rapidly, causing an unprecedented loss of biodiversity-rich forest. In south-eastern Myanmar, where land tenure is highly contested due to several decades of conflict, scientific evidence on these complex social-ecological processes is lacking. In the absence of past satellite data, we applied a participatory mapping approach and co-produced annual land use information with local land users between 1990 and 2017 for two case study landscapes. Results show that both landscapes have undergone a land use regime shift from small-scale farmers' shifting cultivation to plantations of rubber, betel nut, cashew, and oil palm. These changes are likely to have long-term impacts on land users' livelihoods and the environment. We call for a reconsideration of land governance arrangements and concerted land use planning that respects the rights of local land users and strengthens their role as environmental stewards. Applied with careful facilitation, participatory mapping could be an important tool to engage communities in the highly challenging process of transforming land governance to achieve more sustainable outcomes in this post-conflict context.

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1. Introduction

Many forest frontier landscapes in the tropics have recently undergone wide-ranging transformations from subsistence farming to cash crop production (Curtis et al. 2018). Local land use changes are increasingly being triggered by the demands and strategies of actors at multiple levels of governance – a phenomenon that land system scientists termed 'telecoupling' (Liu et al. 2013; Eakin et al. 2014). This is particularly the case in South-East Asia, where the main driver of deforestation has shifted from expansion of agricultural land by smallholders through shifting cultivation to the establishment of large-scale commercial plantations of rubber, oil palm, and other commodity crops (Rudel et al. 2009; Sayer et al. 2012; Fox and Castella 2013). These landscape transformations are deeply affecting the local social-ecological systems, with manifold impacts on people's well-being and the environment. If they are not addressed through transformative strategies and actions towards sustainable development, they might increase social disparities and environmental degradation (Zaehringer et al. 2019).

For a long time, deforestation advanced more slowly in Myanmar than in other South-East Asian countries, as the military government in place between 1962 and 2011 reduced foreign influence to a minimum. Today, Myanmar hosts some of the largest remaining intact forest areas in South-East Asia (Schmidt 2012). However, unprecedented political and economic reforms have put economic development at the forefront, resulting in increasing pressure on these biodiversity-rich forests (Webb et al. 2012). Cropland expansion models under scenarios of increasing agricultural value and political stability forecast large areas of forested land yet to be converted into cropland in Myanmar's border provinces, particularly in the east (Zhang et al. 2018). Commercial logging and the establishment of large-scale commercial crop plantations have come to be the main drivers of deforestation in Myanmar (Rao et al. 2013). Reforms in the forest sector have so far focused mainly on managed timber estates under government control in central Myanmar, while the remaining forests in states inhabited by ethnic minorities have been left outside of effective regulations and management (Woods 2015). Under the military regime, the government strategically allocated large-scale agricultural concessions to businessmen with close ties to military leaders in contested territories, arguably to assure the state's control over these territories (Woods 2011; Gum Ja Htung 2018). Many of the (sometimes very large) oil palm concession areas

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are not yet fully planted (Woods 2015). In spite of this, local land users are not allowed to use the land and are often punished for trespassing. They demand that the government return unused concession land to its customary users, and in the case of Tanintharyi Region in south-eastern Myanmar, the regional government agreed to do so. However, this has not happened to date, and local land users fear that they will irrevocably lose the legal rights to this land under the guise of recent land reforms, particularly the 2012 'Vacant, Fallow, and Virgin Land Management Law' (Thein et al. 2018).

Tanintharyi Region in south-eastern Myanmar is one of the country's contested territories where state control was long limited due to conflict – in this case, a civil war between the Karen National Union and the Myanmar government's military (Lundsgaard-Hansen et al. 2018). Many agribusinesses have been granted concessions in the region, mainly for the production of palm oil and rubber. This has increased pressure on the region's forests, which are among South-East Asia's last remaining high conservation value forests (Donald et al. 2015). The ongoing abandonment of shifting cultivation by smallholder farmers for subsistence rice production constitutes an additional threat to biodiversity, as fallows are being transformed into monoculture tree crop plantations in many places (Prescott et al. 2017). The Myanmar government has explicitly fostered this expansion of commercial agriculture at the expense of other land uses to boost national economic development (Fujita and Okamoto 2006; Woods 2015). The impacts of this widespread landscape transformation on local land users' livelihoods and their vulnerability to external climatic or market shocks have not yet been explored in the context of Myanmar.

The ongoing transformation of Myanmar's biodiversity-rich landscapes needs to be monitored in detail to understand how it is linked to the underlying decision-making processes. These, too, must be thoroughly understood to devise timely and well-targeted interventions towards greater sustainability. In land system science, such wide-ranging and likely irreversible landscape changes that entail a transformation of people's livelihoods from subsistence farming to commercial agriculture, along with institutional changes, are understood as regime shifts (Müller et al. 2014; Ramankutty and Coomes 2016). Land use regime shifts in a landscape can entail several parallel sequences of changes from one land use to another, also called land use change trajectories. Land use regime shifts can happen abruptly, for example as a result of political or economic shocks, or gradually over several decades, for example after the introduction of new policies (Jepsen et al. 2015). Lack of land use data at sufficient spatial and temporal resolution hampers the assessment of land use regime shifts. In the often cloud-covered humid tropics, multi-temporal satellite imagery of the past is scarce and only available at medium to low spatial resolution. A land cover change analysis based on data from only a few points in time over a longer period will not tell us whether a land use regime shift happened abruptly or gradually. An additional methodological challenge lies in the fact that land use, as opposed to land cover, cannot be directly inferred from satellite imagery (Verburg et al. 2009). To monitor the progress of land system regime shifts and identify specific political, economic, climatic, or other events that influenced the land use history, we need to analyse the different land change trajectories occurring in a landscape. This requires annual land use (as opposed to land cover) information that is hard to come by in data-poor contexts like Myanmar.

Participatory mapping of land use changes based on local knowledge offers a potential solution for producing land use information at high spatial and temporal resolution that can complement remotely sensed information (Zaehringer et al. 2018). Participatory mapping of spatial information has been widely applied to include local land users in the process of co-producing legitimate maps of their experienced surroundings (Rambaldi et al. 2006). Purposes of its application include (but are not limited to) delineating current natural resource uses (e.g. Kalibo and Medley 2007; Bernard et al. 2011; Nackoney et al. 2013), mapping people's landscape values (Bourgoin et al. 2012; Fagerholm et al. 2012), and supporting efforts to gain legal recognition of customary land and resource rights (e.g. Wainwright and Bryan 2009; Bryan 2011). Participatory mapping has also been used to validate remotely sensed land use and land cover change data (e.g. Hoover et al. 2017). However, it has rarely been applied to reconstruct dense land use change histories. Co-production of land use information together with local land users has the potential to foster social learning processes and empower marginalized land users (McCall and Minang 2005; Schneider et al. 2017). Accordingly, participatory mapping can serve as both a scientific and a political tool and is well suited to support integrative and engaged science (Ernoul et al. 2018). In Myanmar, due to the country's long authoritarian history, participatory research approaches have only recently gained momentum. Nevertheless, participatory mapping holds promise for supporting the transformation, envisaged in Myanmar's 2030 sustainable development plan (The Government of the Republic of the Union of Myanmar 2018), of land governance towards greater sustainability.

To shed light on land use regime shifts in the context of rapidly advancing social-ecological transformations in Myanmar, we applied a participatory mapping approach and established annual land use change histories for two case study landscapes in Tanintharyi Region, where land tenure is highly contested. In this paper, we describe how the different land use categories

evolved between 1990 and 2017 and assess whether a land use regime shift has taken place in the study landscapes. We frame our findings in the context of political and institutional changes in the country. In the discussion, on the one hand, we reflect on our methods and highlight lessons learned from implementing a participatory mapping approach in a post-conflict context. On the other hand, we reflect on our empirical findings, which contribute to the literature of land use regime shifts in former shifting cultivation areas, and focus on their potential implications for sustainable development in Myanmar.

2. Methods

2.1. Case study landscapes

For this study, we selected two case study landscapes in the forest-frontier context of Yebyu Township, Tanintharyi Region, in south-eastern Myanmar (see Figure 1). The two landscapes are representative of the more widespread land uses in Tanintharyi Region, including forest, subsistence rice cultivation, rubber, oil palm, betel nut, cashew, and other cash crop plantations (De Alban et al. 2019). As we planned to use participatory mapping to document annual land use change histories, we chose the village scale for our assessment. Tanintharyi Region is characterized by a humid tropical climate, with one main rainy season from May to October. The region has about 1.2 million inhabitants, of which the large majority are Buddhist (MIMU 2018). It has experienced major improvements in terms of security since 2012, when ceasefire agreements and political dialogues ended a decades-long civil war between the Karen National Union and the Myanmar government. Nevertheless, safety considerations also played an important role in selecting the case study landscapes, as there is still a lot of tension between the two parties in many areas of Tanintharyi region.

Each case study landscape consists of one village and the land that is, or was, customarily used by its inhabitants. The two villages differ in terms of official land zoning regulations, ethnicity, and accessibility. Village A is located in an area officially classified as Reserved Forest, which is admi-nistered by the central government's Department of Forestry (World Resources Institute 2016) and where any agricultural activities undertaken without the Department's authorization are formally illegal. The population mainly consists of members of the Karen ethnic minority, and the village is difficult to access, as it is reachable only via secondary roads. Village B lies in a zone designated for agricultural purposes, and its population is mainly Burmese. It is easily accessible, as it is located on the main road from Kaleinaung to Dawei. Village B lies close to the Tanintharyi Nature Reserve (TNR), a protected area established in 2005.

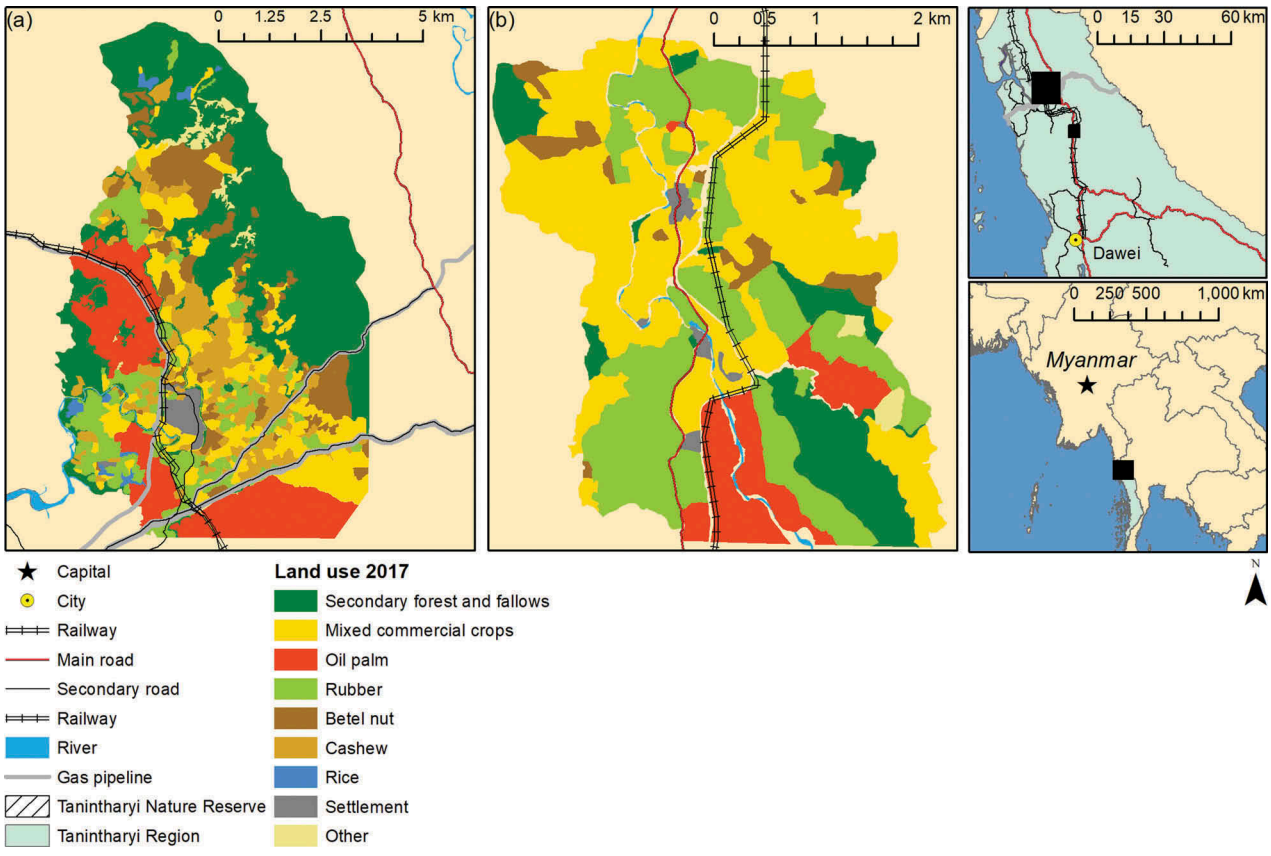

Figure 1. Overview of case study landscapes in Tanintharyi Region, Myanmar.

2.2. Remote sensing and participatory mapping

At the outset of this study, in March 2017, we conducted exploratory focus group discussions in each of the study villages (n = 11 to 28 participants) to discuss the main land use changes, their drivers, and their impacts on the environment and human well-being with local land users. We asked the village chief to invite as many interested village inhabitants as possible, ideally representing the overall village population in terms of livelihoods, wealth level, and gender. Myanmar researchers facilitated the focus groups in Myanmar language (Burmese) in the local village hall. Participants were asked to list all past land use changes they could remember and then rank them based on how positively or negatively they affected their well-being using coloured stickers. Each land use change was then discussed in more detail regarding who benefitted and who was negatively affected, in what way. Further, participants discussed the impact of each land use change on the environment. Based on these discussions, we decided to take 1990 as the starting point for the empirical investigation of land use changes in our case study landscapes, as land users had said that the main land use changes had occurred after this date. To map land use in the two case study landscapes for every year since 1990, we combined remote sensing with participatory mapping. This novel approach has been described in detail by Zaehringer et al. (2018); here, we only provide details regarding its implementation in the selected case study landscapes in Myanmar.

Based on the focus group discussions, we developed a land use categorization system. Next, we conducted a participatory mapping workshop on two consecutive days in each of the two study villages. The main goals of these workshops were: (1) to identify and label the main geographical features of the case study landscapes, (2) to delineate the borders of current plots with distinct land uses and assign the plots to the different land use categories based on very high-resolution satellite imagery; and (3) to document the spatially explicit land use change trajectory of each delineated plot. For these mapping workshops, our aim was to work with local experts on land use change – that is, those land users most knowledgeable about land use change in their village. We therefore asked the village chief to invite around 10 participants that had been using land over a longer period of time (ideally since 1990) in different parts of the village and that would have knowledge about the different types of crops planted in the village. While five land users contributed to the participatory mapping workshop in Village B, the one in Village A involved 14 land users. However, some of these did not stay for the whole workshop but rather helped to map only those parts of the village that they were most familiar with. The participants were generally better educated than the average village inhabitant and included, for example, the village chief and the person responsible for forest in the village. The participatory mapping workshops were conducted in Myanmar language (Burmese) and facilitated by the third author of this paper, a Myanmar researcher specializing in spatial analysis and knowledgeable about the local context in Tanintharyi Region. In the beginning of each workshop, the facilitator explained the workshop objectives and highlighted that the aim was to map land use (i.e. what type of crops were produced on what land or how forested areas were used) and not individual land tenure. This distinction was important, given the history of conflicts related to land tenure in the case study areas. Trust between the workshop participants and the researchers had been established over the course of the previous 18 months, during which the researchers had repeatedly been present in the villages for other project activities. Before starting their research activities in the villages, the research team including both Myanmar and international researchers completed a detailed risk assessment to make sure that none of the participants in any of the research activities would be put in danger or suffer any repercussions.

As a current reference point and basis for establishing the land use change history, we commissioned very high-resolution Pléiades satellite images of the case study landscapes of Village B and Village A in November 2016 and February 2017, respectively (Table 1). To use the satellite images in the participatory mapping workshops, we printed them in colour and with a metric grid onto A0-format paper. We selected a scale of 1:10,000 to enable a detailed view of the imagery's features.

Table 1. Details of participatory mapping conducted in the two case study landscapes.

	Village A	Village B
Satellite imagery acquisition date	Pléiades, 25 February 2017	Pléiades, 11 November 2016
Number of mapping workshop participants	14	5
Field walks/motorbike rides [km]	142	17
Number of polygons	620	155
Average size of polygons [ha]	11.38	9.43
Total mapped area [km^2]	70.54	14.62

The images were covered with transparent plastic sheets, on which the workshop facilitator wrote the names of distinctive natural (e.g. rivers, mountains) and infrastructural (e.g. roads, railways) features. At the beginning of each workshop, the participants took quite a long time to become acquainted with interpreting the satellite images, and these features helped with orientation. Finding a common understanding of the proposed land use categories was another challenge that took up a significant amount of time. As the workshop participants had difficulties separating the categories of secondary forest (i.e. forest regrowth that is no longer part of a shifting cultivation system), shifting cultivation fallows, and shifting cultivation rice fields for the past, we had to merge them into a single land use category, which we called 'Secondary forest and fallows'.

With the help of the participants, the facilitator then delineated the borders of current plots with distinct land uses, drawing polygons on the transparent sheets. To label the land use categories for the different plots in different years as explained by the workshop participants, the facilitator used sticky notes in different colours. Within each workshop, a smaller subgroup of participants was especially engaged with the mapping process and seemed to take it as a matter of personal interest to come up with the most exact representation of the land use history, while others were more passively involved. In the beginning of the workshop, the facilitator made it clear that participants could leave whenever they felt tired or felt that they could not provide any more information.

To complete the land use history for those polygons for which the workshop participants were unable to provide detailed information, the third author of this paper conducted field walks together with other land users from the study villages who were knowledgeable about the land use history of those specific areas. During these field walks, the researcher took GPS points for the land uses encountered along the way and asked the land users since when the specific land use had been in place, and what the previous land use had been, and the one before that, and so on, until they had traced the land use history back to 1990. In the case of Village A, the field team used a motorbike to move around the case study landscape, which was much larger than the one in Village B. When the team arrived back in the village, the researcher added the land use information to the map from the workshop.

In a last step, the polygons were spatialized in eCognition Developer software (Trimble 2013) by means of object-based segmentation and manual modification. The annual land use information collected during the participatory mapping workshops and field walks was then attributed to each polygon's attribute table in ArcGIS (ESRI 2016). We refrained from verifying land users' recall of past land use, as only one other very high-resolution satellite image would have been available for the past. To visualize the land use change trajectories, we produced spatially explicit annual land use maps in ArcGIS and stacked area charts in the R statistical software (R Core Team 2015). The interpretation of mapping results was supported with information from stakeholder interviews for which detailed information is provided in Lundsgaard-Hansen et al. (2018). These interviews were conducted with representatives of the village administration, land users, regional entrepreneurs, a private agribusiness, a military agro-industrial company with a concession for oil palm cultivation, landless migrant workers, the Tanintharyi Nature Reserve Project, and an international NGO that supports community forestry. In total, the second and fifth author of this paper together conducted 31 semi-standardized interviews on these stakeholders' activities, strategies, and resources. They analysed the data using thematic coding and comparative content analysis.

3. Results

3.1. Overall land use changes in the case study landscapes

In this section, we present our findings regarding the evolution of the six main land uses in Village A and Village B case study landscapes between 1990 and 2017 (Figure 2, Table 2) and interpret them using information from the stakeholder interviews. The spatially explicit land use changes from year to year in the two case study landscapes may be viewed in online visualizations (https://datablog.cde.unibe.ch/wp-content/uploads/figure3.html).

The first finding concerns the dominant land use in both case study landscapes at the beginning of our study period in 1990 – a mix of secondary forest and shifting cultivation fallows (Figure 2, Table 2). This land use shrank tremendously over time and in 2017 covered as little as 36% of the area in Village A and 13% in Village B in 2017. Results from the stakeholder interviews showed that the massive decline in shifting cultivation in the case study landscapes over the last 27 years is explained by a combination of different factors. These include new opportunities for generating income, especially from rubber (*Hevea brasiliensis*) and betel nut (*Areca catechu*), which encouraged people to transform their shifting cultivation systems into permanent tree crop plantations. The entry into force of the Farmland Law in 2012 (The Republic Union of Myanmar 2012), which requires land to be under permanent cultivation in order for users to obtain a land use certificate, was another important reason for land users in Village B to abandon shifting cultivation. But even in Village A, where the law does not apply, land users

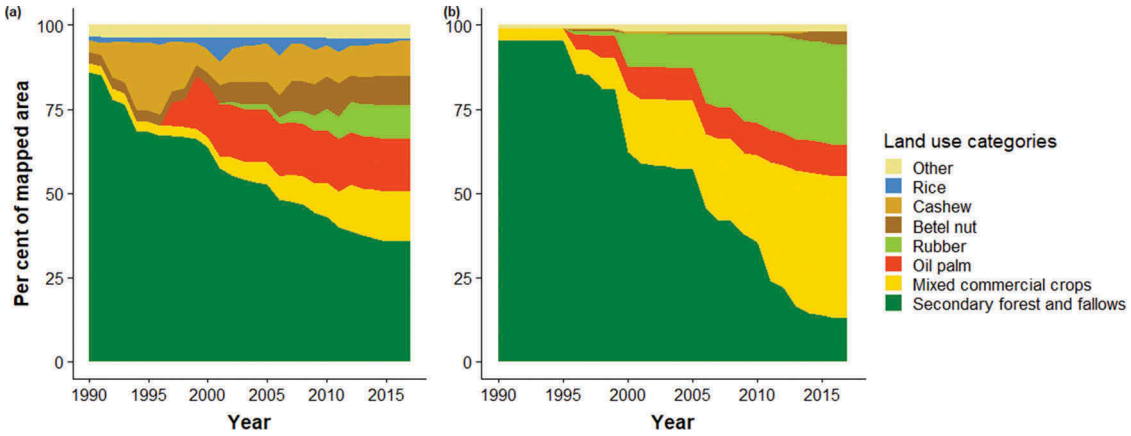

Figure 2. Land use change between 1990 and 2017 in per cent of the total mapped area, in the case study landscapes of (a) Village A and (b) Village B, both in Tanintharyi Region, Myanmar.

Table 2. Shares of land use categories (as percentage of total analysed area) and net area of change (as percentage of total analysed area) for the years 1990 and 2017 in Village A and Village B.

	Village A			Village B		
Land use category	% area 1990	% area 2017	Net area of change (%)	% area 1990	% area 2017	Net area of change (%)
Secondary forest and fallows	86	36	−50	95	13	−82
Mixed commercial crops	3	15	12	3	42	39
Oil palm	0	16	16	0	9	9
Rubber	0	10	10	0	30	30
Betel nut	3	9	6	0	4	4
Cashew	4	11	7	0	0	0
Rice	1	1	0	0	0	0
Other	4	4	0	2	2	0

planted permanent crops to manifest their use of the land, as they feared the land might be acquired by external investors and companies. Other factors include the increased availability of affordable rice on local markets, which allowed local land users to abandon rice cultivation for subsistence, as well as improved security, which enabled them to stay in their villages and take care of permanent plantations. Furthermore, with more and more land being occupied by external actors, local land users increasingly face difficulties accessing land for cropland expansion; this, too, might have led to agricultural intensification in the case study landscapes.

Second, monoculture rubber plantations were less important in Village A than in Village B (Table 2). In Village A, they were introduced in 2000 and covered only 10% of the landscape in 2017. In Village B, by contrast, we observed a large expansion of monocul-ture rubber plantations over the study period. The first ones were established by smallholder farmers in 1996. A marked increase occurred from 2000 to 2015, with monoculture rubber plantations covering 30% of the case study landscape since. According to land users interviewed in Village B, local authorities informed them around 2006–2007 that each household would have to grow at least five rubber trees. This likely happened in the context of the Myanmar government's plan to expand the rubber market, and it might explain the marked expansion of rubber between 2005 and 2007 in Village B (Figure 2). However, the expansion was not exclusively driven by local land users; the apparently high availability of land in Village B attracted outside investors who also established rubber plantations.

Third, oil palm (*Elaeis guineensis*) plantations were established in 1997 in Village A and in 1996 in Village B, after which they remained stable in both case study landscapes (Figure 2). Today, they cover 16% of the area in Village A and 9% in Village B (Table 2). Stakeholder interviews revealed in both cases that the plantations had been established by actors from outside the case study landscapes who aimed to produce palm oil to meet the national demand for edible oil, soap, and other products. In the case of Village A, a military-owned com-pany planted oil palms on 1,102 ha (although the concession covered a larger area). In Village B, it was mainly private agribusiness companies who acquired a total of 138 ha of land for oil palm plantations.

Fourth, the land use category of mixed commercial crops consists mainly of rubber plantations mixed with other tree crops such as betel nut or cashew. In both case study landscapes, this land use category was almost inexistent in 1990 and developed in the course of the study period (Figure 2, Table 2). In 2017, mixed

commercial crops covered 15% of the landscape in Village A. In Village B, they expanded more significantly, covering about 42% of the area in 2017.

Fifth, with monoculture cashew (*Anacardium occidentale*) plantations it is much the other way round: Village A experienced a steady increase in monoculture cashew plantations between 1992 and 1997, when some land users started to mix cashew with betel nut and/or rubber; whereas in Village B, we found no monoculture cashew plantations at all (Figure 2, Table 2).

Rice (*Oryza sativa*) fields, finally, covered a very small percentage of Village A's landscape in 1990, and that percentage remained almost stable over time (Figure 2, Table 2). In Village B, land users grew rice exclusively through shifting cultivation during our study period; accordingly, rice cultivation is hidden in the secondary forest and fallow category of land use.

3.2. Land use change trajectories

In addition to showing how specific land uses evolved over time, the annual land use information allows us to take a closer look at the sequence of multiple land use changes on a given plot, or the plot's land use change trajectory, over the study period (Figure 3).

In Village A, the most frequent land use change trajectories since 1990, which together cov-ered about 50% of the total area assessed, all started with secondary forest and fallows being converted to cash crops (Table 3). The most important trajectory by area, covering 15.6% of the case study landscape, is from secondary forest and fallows first to cashew and later to oil palm. This trajectory evolved mainly on three large plots that all belong to a military-owned company today (Figure 3). The next most common trajectories were from secondary forest and fallows to cashew, and from secondary forest and fallows to monoculture rubber plantations (Table 3). In most cases, these two trajectories also included one year of rice cultivation immediately after the secondary forest and fallows were cut. The conversion from secondary forest and fallows to mixed commercial tree crop plantations with or without rubber, containing mainly betel nut, cashew, lime, and other tree species, was widespread as well, and a similar percentage of the overall landscape was converted from secondary forest and fallows to monoculture betel nut plantations (Table 3).

The only land use change trajectory that did not start with secondary forest and fallows in 1990 and which concerned more than 1% of the assessed area was the conversion from cashew to rubber plantations (Table 3). By far the most important land use category that did not experience any change between 1990 and 2017 was secondary forest and fallows. It accounted for 36 of the 46 per cent of stable area in Village A.

Village B presented a similar picture, with second-ary forest and fallows being the main land use con-verted to mixed commercial crops and monoculture rubber plantations (Table 3). About 10% of the area was converted from secondary forest and fallows to oil palm, and 3.7% was converted from secondary forest and fallows to betel nut. In contrast to Village A, Village B does not have any monoculture cashew plantations. Together, the changes covered more than 80% of the Village B case study landscape. Only 13% of the area was still covered with secondary forest and fallows in 2017. This accounted for the largest part of stable areas between 1990 and 2017.

Table 3. Land use change trajectories and areas that remained stable between 1990 and 2017 in the case study landscapes of Village A and Village B. Only trajectories covering more than 1% of the total assessed area are presented; the remaining change trajectories are aggregated under 'other changes'.

	Land use change trajectory	Area [ha]	% total area
Village A	**Change**	**3,784.9**	**53.7**
	Secondary forest and fallows to cashew to oil palm	1,101.6	15.6
	Secondary forest and fallows (to rice) to cashew	600.2	8.5
	Secondary forest and fallows (to rice) to rubber	497.6	7.1
	Secondary forest and fallows to mixed commercial crops	406.6	5.8
	Secondary forest and fallows to betel nut	404.5	5.7
	Secondary forest and fallows to betel nut to mixed commercial crops	204.0	2.9
	Secondary forest and fallows to cashew to mixed commercial crops	199.0	2.8
	Cashew to rubber	92.1	1.3
	Secondary forest and fallows to cashew to rubber	70.9	1.0
	Other changes	208.2	3.0
	Stable categories	**3,268.7**	**46.3**
Village B	**Change**	**1,205.8**	**82.5**
	Secondary forest and fallows to mixed commercial crops	556.8	38.1
	Secondary forest and fallows to rubber	432.5	29.6
	Secondary forest and fallows to oil palm	138.8	9.5
	Secondary forest and fallows to betel nut	54.4	3.7
	Other changes	23.24	1.6
	Stable categories	**256.2**	**17.5**

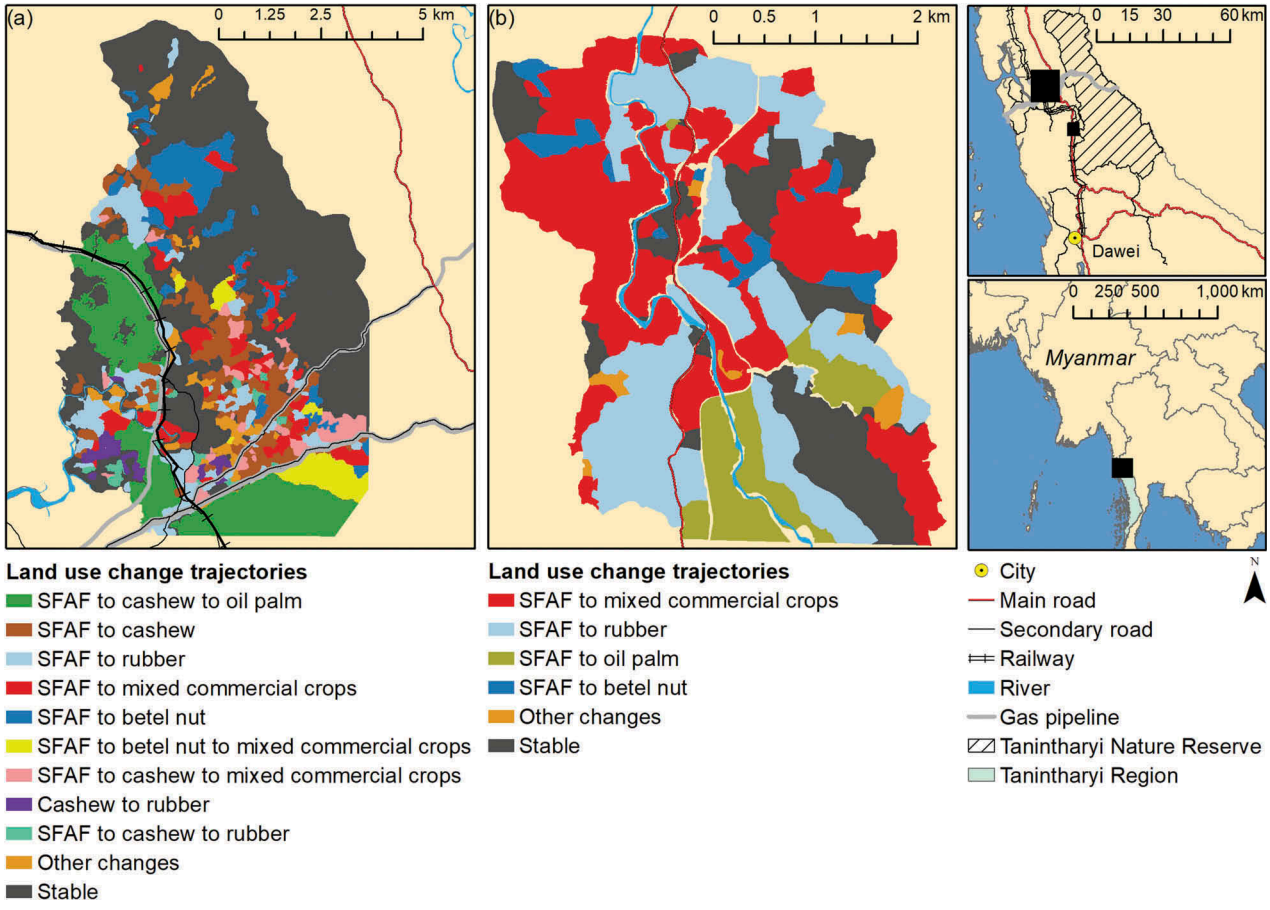

Figure 3. Map of land use change trajectories between 1990 and 2017 in the case study landscapes of (a) Village A and (b) Village B, both in Tanintharyi Region, Myanmar. (SFAF = Secondary forest and fallows).

4. Discussion

4.1. Land use regime shifts from subsistence to cash crop farming

In our study in a humid tropical forest-frontier context, participatory mapping proved a powerful approach to tackling the methodological challenge presented by the lack of very high-resolution satellite imagery for assessing past land use changes. The annual land use information obtained through participatory mapping workshops and field walks enabled us to shed light on the developments that led to an extensive loss of secondary forest and a steep decline in shifting cultivation in two case study landscapes. These insights would not have been possible without the annual information. For example, had we only considered land use at the beginning and at the end of our study period (i.e. in 1990 and 2017), the largest share of deforestation and abandonment of shifting cultivation in Village A would have appeared to have been caused by the expansion of oil palm plantations. The case study landscape's detailed land use history, however, reveals that secondary forest and fallows were first converted to cashew plantations by small-scale land users before a military-owned external agribusiness acquired the land and established oil palm plantations on it. This is an important nuance in the debate about the role of oil palm expansion in the deforestation of high conservation value forests in Myanmar (Woods 2015). Cashews are produced for domestic and international markets and generate income for small-scale land users. With the conversion of cashew to oil palm plantations, many local land users lost access to this land and the opportunity to profit financially. Another large part of the secondary forest and fallows in Village A – and the entire area converted from this land use in Village B – was converted into mixed or monoculture cashew, betel nut, and rubber plantations by small-scale farmers as well as external private investors. In Village A, some land users converted secondary forest and fal-lows first to monoculture plantations of either betel nut or cashew, and later diversified them by mixing in the other of these two crops or rubber.

The mapping of land use change trajectories over almost 30 years revealed that our two case study landscapes have undergone land use regime shifts (Müller et al. 2014) from small-scale land users' farming systems for subsistence production to local land users', external private investors', and agribusinesses' farming systems for cash crop production. Due to the large labour and financial investments involved, the transformation of

landscapes dominated by secondary forest and fallows into different cash crop cultivation systems focusing on rubber, oil palm, betel nut, and cashew likely presents a permanent land use change – or, in other words, a land use regime shift. In theory, this shift is not necessarily irreversible, as modelling studies predict land abandonment even for intensively cultivated areas in certain world regions (Price et al. 2015). It is unlikely to be reversed, however, given the ongoing population growth and people's high dependence on land for their livelihoods in Tanintharyi Region (Department of Population, Ministry of Immigration and Population 2015). Accordingly, this shift is likely to have long-lasting and multifaceted implications for local livelihoods and the environment.

A large share of the land users in our case study landscapes have abandoned subsistence rice production through shifting cultivation and permanent rice cultivation. Instead, they now rely on income from the sale of rubber, betel nuts, and cashews for their livelihood. Such social-ecological changes towards greater market dependency have been documented all over South-East Asia (e.g. Huijun et al. 2002; Thongmanivong and Fujita 2006; Setboonsarng et al. 2008; Rigg 2014; Friis et al. 2016), and there is concern that they might increase the vulnerability to external shocks of the poorest households relying on shifting cultivation (Castella et al. 2012). In our case, households generated income from a diversity of sources, and it remains unclear whether their increased reliance on monetary income presents a substantial risk to their food security. Oil palm plantations, however, were mainly controlled by private and military-owned agribusinesses. This contributed to an increasing shortage of land among small-scale farmers, thereby possibly indirectly incentivizing them to intensify production on their own land. Although the agribusinesses appeared to have offered local land users some casual wage labour opportunities, the latter did not seem to be interested, as they disagreed with the occupation of their land by external investors in the first place. Despite increasing land shortage, overall, many of the small-scale farmers in our case study landscapes seemed to be in a more favourable position economically in 2017 than they had been in 1990 (Nydegger 2018). It is probably the environmental dimension of sustainability that is impacted most severely by the land use regime shifts in our case study landscapes, although we have not studied this in detail. The new land uses that replaced secondary forest and fallows most likely provide different bundles of ecosystem services to local land users, with various implications on the well-being of different people (Raudsepp-Hearne et al. 2010; Feurer et al. 2019). However, as Rasmussen et al. (2018) have shown, agricultural intensification can lead to positive well-being outcomes despite environmental degradation, at least in the short term. Future research in Myanmar therefore needs to look deeper into these complex social-ecological pathways associated with smallholders' transition from subsistence to commercial farming in order to fully understand the implications that such a land use regime shift has for sustainable development.

Based on our findings, we would like to make three key management and policy recommendations:

(1) Land use planning is key. Until now, land users have continuously adapted their land uses in response to various political and economic signals. To preserve the diversity of land uses and their different social and ecological functions in the future, this adaptation must happen in a more concerted manner. This would require ensuring that village authorities as well as individual land users have access to information, for example on government strategies targeting land use, on expected trends in cash crop prices, or on scientific knowledge about the capacity of different land uses to provide various ecosystem services in their current state and under future land use change scenarios. Capacity building, preferably through experts from Myanmar, will be crucial in developing the collective and individual skills needed to interpret and integrate different types of information and knowledge into land use decision-making. Moreover, since sustainable development is a highly normative issue, it is important to consider all the different stakeholders' claims on land and to enable processes through which trade-offs between different sustainable development goals can be negotiated. As sustainable development is a highly dynamic and complex process, such negotiations should not aim at reaching a final state in the form of 'a sustainable landscape'. Instead, ensuring that different voices are heard and considered, and that those who lose out in the process are compensated in one way or another, might help build up legitimacy of external interventions from governmental and other stakeholders, and thus reduce the potential for land use conflicts in Tanintharyi Region.

(2) In line with this, the contribution of current land governance arrangements to sustainable development needs to be carefully reconsidered and local land users' land rights strengthened. Although the 2012 Farmland Law has enabled land users in certain land zones to obtain a so-called 'Form Seven' land use certificate, the overall legal framework continues to contain a lot of ambiguity that needs to be resolved (Mark 2016).

(3) Finally, to protect the unique biodiversity of Tanintharyi Region, local land users – who probably have the strongest values with respect to forests (Feurer et al. 2019) – must be supported in taking on the role of environmental stewards. They already have the possibility to apply for community forestry certificates, but most of them are unaware of this opportunity (Lundsgaard-Hansen et al. 2018).

4.2. Co-production of knowledge through participatory mapping in a post-conflict context

Myanmar poses several challenges to researchers, due to the many years of political and economic isolation and civil war. First, there is a general lack of accessible data on land use and land tenure, with a few exceptions, such as the Myanmar Information Management Unit platform, which maintains a repository of data from all sectors (MIMU 2019). Second, most local land users have never been exposed to foreigners, let alone international researchers, as foreigners need a special permit to visit villages in highly contested, post-conflict rural areas like Tanintharyi Region. Our participatory mapping approach allowed us to address both challenges in an integrative way, by co-producing scientific knowledge together with local land users, and it yielded important benefits.

(1) The co-production of land use change information in the under-researched context of Tanintharyi Region constituted an important contribution to scientific knowledge production. It addressed the systemic perspective of land system science research, which is indispensable in knowledge production for sustainable development (Zaehringer et al. 2019). Furthermore, engaging local land users in knowledge production helped to make the research process more accessible to them. This is particularly important in this post-conflict context, where the various local stakeholders follow all interventions by outsiders with scrutiny, and uncertainty about the processes and purpose of research can easily lead to rumours and false expectations.

(2) The participatory mapping exercise served as a social learning tool (Schneider et al. 2009; Reed et al. 2010), initiating a learning process among workshop participants through interaction with others in a safe space. The participatory mapping workshops attracted participants, some of them illiterate, who were interested and curious to engage with the researchers, receive intellectual stimulation, and learn about their own surroundings. At first, participants had difficulties orienting themselves on the printed satellite imagery. Through careful facilitation by the third author (a Myanmar national), they learned how to identify important spatial references and to relate the imagery to their real surroundings. The bird's-eye view of the satellite imagery provided them with a new perspective on their villages and the surrounding land. Asking the participants to contribute their knowledge on historical land use changes to the imagery rendered their local knowledge explicit. Discussions about land use changes on different plots enabled the participants to reflect more deeply on the causes of these changes and their impacts on local people's well-being and the environment, in continuation of the work that had taken place in the focus groups. This is crucial in the context of rapidly progressing deforestation and environmental degradation, which may have far-reaching impacts on the well-being and land use options of future generations.

(3) At the same time, participatory mapping can serve as a way of bringing to the fore the voices of local land users, who are often marginalized by external investors or government actors who have substantially more resources for defending their claims (Lundsgaard-Hansen et al. 2018). Some participants in Village A appreciated the participatory mapping process especially because it confirmed, in a spatially explicit way, that the military-owned oil palm company had occupied land that had previously been used by local farmers.

Our approach could also be useful in other contexts and projects that aim at jointly producing information about land use and the environment. However, there are some limitations that researchers and practitioners need to consider. First, mapping land use changes plot by plot in a workshop setting is very time-consuming, and therefore only suitable for fairly small areas (i.e. village level). Second, issues of land tenure and land ownership are highly sensitive in a post-conflict context such as the one we encountered in Tanintharyi Region. Maps are a powerful tool in such a contested environment, and different stakeholders might try to influence mapping outcomes for their benefit, depending on their power and their interest in influencing the mapping process (Kyem 2006). Our stance as researchers for sustainable development applying a transdisciplinary research process is that we explicitly consider ourselves stakeholders in the process rather than objective observers. This means that we are aware that our own norms influence the process and outcomes (Nielsen et al. 2019). While it was not our intention to directly challenge power dynamics through the mapping endeavour – which is the purpose of critical cartography (Kim 2015) – the choices we took with respect to the selection of participants and what to map do have power implications. We therefore need to reflect on 'who gains and who loses' (Chambers 2006) from our intervention. For example, by selecting participants from village inhabitants who have lived in the area for a long time, we excluded investors more recent to the area. Although we refrained from mapping land tenure, land use change maps may likewise highlight conflictive issues such as the establishment of oil palm plantations run by military-owned and private agribusinesses. The village inhabitants now have maps at their disposal that show what land areas and land uses were lost to oil palm plantations. This might lead to claims for compensation. However, they are still in a weaker position than the oil palm investors, who have connections to the government and are much better endowed with

resources. Therefore, while the participants in the mapping exercise might have gained from the process, it is safe to assume that the oil palm investors did not, and will not, lose anything. Mapping of historical land use change has fewer implications for various stakeholders' attempts at territorialization than mapping of future land use with a focus on use rights. Nevertheless, any participatory mapping endeavour requires very careful facilitation, cautious communication of mapping results with regard to their validity, and a clear data management plan, especially in a conflict or post-war setting.

For the future, we see important opportunities for participatory mapping as well as the co-production of scientific knowledge in Myanmar, as the Myanmar government has recently published its Sustainable Development Plan for 2018–2030. According to this plan, to increase the ability of all people to engage with the government is part of the government's strategy (The Government of the Republic of the Union of Myanmar 2018). However, the government's interactions with civil society in Tanintharyi Region have been rather unfruitful so far. In this context, a participatory approach holds potential to support the transformation towards more sustainable land governance. The co-production and visualization of spatially explicit local knowledge helps to promote local peoples' concerns vis-à-vis higher-level authorities or external actors (Rambaldi et al. 2006). In order to advance sustainable development in Myanmar in a process that includes the voices of local communities, local land users first need to define the problems and challenges of sustainable development from their perspective. Applied with careful consideration and reflexion, participatory mapping could be an important tool to engage local communities in the highly challenging and complex process of transforming land use and land governance towards more sustainable outcomes in Myanmar.

5. Conclusion

Land use in Myanmar is changing at unprecedented temporal and spatial scales. Applying a combination of remote sensing and participatory mapping in two case study landscapes in Tanintharyi Region, our study found that both case study landscapes have undergone a land use regime shift between 1990 and 2017. The majority of land formerly used by small-scale land users for shifting cultivation for subsistence rice production, as well as secondary forest patches, have been converted into new and more intensive land use systems. The most prominent new land use categories are mixed and monoculture tree crop production systems for commercialization by small-scale land users and external private investors, consisting mainly of rubber, betel nut, and cashew, as well as commercial oil palm plantations run by military-owned and private agribusinesses. These changes are likely irreversible due to the high monetary and labour investments involved in the land conversion. The loss of secondary forest and fallow vegetation might affect ecosystem service supply to local land users as well as to stakeholders at other levels. Further research is needed to gain a detailed understanding of how these land use changes affect the provision of ecosystem service benefits to socially disaggregated types of land users, and how peoples' relations with their environment have changed over time. Our participatory mapping approach enabled foreign and Myanmar researchers to co-produce scientific knowledge together with land users at the village level. It has potentially contributed to social learning among participants, offering them a new perspective on their environment and triggering reflection on the implications of these land use changes for their current and future well-being. Such a transdisciplinary approach is highly suited to support the generation of knowledge for sustainable development, which includes lasting peace and environmental integrity, in a highly contested and biodiversity-rich environment like Tanintharyi Region in southern Myanmar.

Author Contributions

J.G.Z. designed the study, analysed the data, and wrote and revised the manuscript. T.T.T and F.S. conducted the participatory mapping workshops and field walks and contributed to writing the manuscript. J.C.L contributed to conceptualizing and designing the participatory mapping approach and to revising the manuscript. L.L-H., N.N.T., and W.M. conducted stakeholder interviews and focus group discussions in the case study landscapes and contributed to writing the manuscript.

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Paper II: Whose agency counts in land use decision-making in Myanmar?

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Whose Agency Counts in Land Use Decision-Making in Myanmar? A Comparative Analysis of Three Cases in Tanintharyi Region

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Abstract: Myanmar has experienced profound transformations of land use and land governance, often at the expense of smallholders. Empirical evidence on the agency of actors included and excluded in land use decision-making remains scarce. This study analyses who influences land use decision-making, how they do this, and under what circumstances smallholders are included. Comparing three land use trajectories in southern Myanmar, we analysed actors' agency—conceived as the meanings and means behind (re)actions—in land use decision-making using data from focus groups and interviews. Results showed that uneven distribution of means can lead to unequal decision-making power, enabling actors with more means to exclude those with less means: smallholders. However, this only applies in the case of top-down interventions with mutually exclusive actor interests regarding use of the same land. Where interests are compatible or a mediator supports smallholders in negotiations, actors are likely to develop a collaboration despite unequal means, leading to smallholders' inclusion in decision-making. Transformation of current land governance towards sustainable development could be promoted by providing mediators to actors with few means, ensuring equal access for all to formal land tenure, engaging with brokers in the land governance network, and improving access to knowledge and financial capital for actors with few means.

Keywords: Burma; land system science; land governance; land use change; smallholders; sustainable development

1. Introduction

Land governance in Myanmar has seen major changes over the past decades. The military government in power from 1962 to 2011 established a highly centralised, authoritarian state and a strongly regulated economy [1], reducing foreign influence to a minimum. Ethnic armed organisations resisted the central government in what became a long civil war, and Myanmar was outpaced economically by its neighbouring countries. The military government implemented agricultural master plans, reformed its land-related laws and policies, and granted concessions to wealthy or military-related investors in order to increase the number of prosperous large-scale agricultural projects that would boost development [2–6]. Previous local land users—most of them smallholders and many practising shifting cultivation—were usually excluded from land use decision-making in

such government-initiated projects, and therefore lost access to the land they had been using. Many large-scale agricultural projects were implemented in ethnic minority areas or areas of insurgency, raising concerns that these development initiatives may have served purposes of control and state-building [7,8]. Moreover, agricultural expansion led to considerable deforestation [2,9]. With the partial opening of the country under the reform government from 2011 to 2016, national civil-society organisations as well as national and international nongovernmental organisations (NGOs) began to publicize the concerns of those who had experienced injustice, releasing a growing number of reports on land conflicts with detrimental outcomes for smallholders and ethnic minorities [10–13]. Besides acquisitions of arable land for commercial purposes, reports point to a growing number of land acquisitions aimed at conservation—also referred to as "green grabbing"—that threaten the legitimacy of local (mostly ethnic-minority) communities' land use and hence their existence [10,14]. Furthermore, increasing liberalisation of the agricultural sector after 2005 and 2011 and the decrease in armed conflicts after 2011 led to spatial expansion of cash crops like rubber at the cost of forest ecosystems [2,15–17]. However, land users face a complex and often incoherent conglomerate of laws and policies that has accumulated over the past decades and makes land tenure a conflictive issue in Myanmar [18]. In areas where the Myanmar government and ethnic political organisations both claim authority and decision-making power, land users are even exposed to contradictory policies on land (see Appendix A). Also relevant for Myanmar's current but fragile post-war process towards democracy [19], these developments in Myanmar's land use systems pose considerable challenges to sustainability. The dynamics of such developments are crucially shaped by those actors whose agency counts [20]. Agency generally refers to actors' ability to act in pursuit of their interests [21]. However, empirical evidence on agency in the context of land use system transformations in Myanmar is very scarce to date.

One of the current research frontiers of land system science is the search for a useful framework for assessing actors' actions and agency in land use decision-making in the context of transformations of land use systems and land governance [22,23]. The definition of governance provided by Graham et al. [24] implies that a multitude of diverse actors—with their power, relationships, and accountability—as well as formal and informal institutions constitute the governance arena where decision-making processes take place [25,26]. In this study, we understand governance of land to encompass and formally and informally regulate, among others, access to land [27,28], land tenure and land use decision-making, land use changes and trajectories [22,29], customary practices, and formal policies and laws. Elements of land governance such as policies or decision-making processes can overlap, but may also conflict with one another or even be contradictory [24]. Scholars stress the critical role of actors' actions, agency, and power relations in the context of land governance—including land use decision-making—and its transformation [30–34]. Eakin et al. [30] and Seto and Reenberg [35] suggested defining actors' actions and reactions as the interplay between activities and agency, while agency in turn is a combination of meaning and means. According to Wiesmann et al. [21] and Bourdieu [36], the analysis of actors' agency in terms of meaning and means can yield insights into power relations, as uneven distribution of material and immaterial means among actors can cause power imbalances. Accordingly, there is a growing need in land system science for better understanding how the agency of actors involved in and excluded from land use decision-making shapes short-term land use changes and long-term land use trajectories [22,29]. Given that actors contribute to and steer transformations [21,37–40], this understanding can also help to identify potential leverage points [41,42] for promoting transformations of land systems and their governance towards sustainable development.

The present paper contributes to this debate in land system science about actors' actions and agency in land use decision-making and provides much-needed empirical evidence on whose agency influences land use decision-making in Myanmar, and why. The study was guided by the following research questions: How did actors' actions and reactions shape land use trajectories in Myanmar? Whose agency counted in land use decision-making, and why? Moreover, as it seems particularly

important from the point of view of sustainable development that smallholders in Myanmar are included in land use decision-making, we also asked: How did some smallholders manage to be included in land use decision-making? To answer these questions, we combined land system scientists' understanding of action and agency with a human actor model [21] (based on multiple past papers [36,40]), and the concept of means [21,43] used by sustainability and development scientists.

In this paper, we first describe the basic characteristics of three selected land use trajectories (including official land zones, the timeline of land use changes, spatiotemporal dynamics, and territorial claims) and analyse actors' actions and reactions in terms of their activities and their agency along each of the three trajectories. This analysis shows what happened along each of the three land use trajectories and why. In a second step, we compare actor interactions across the three land use trajectories, focusing on differences and similarities in agency related to the land use trajectories. This comparison sheds light on why some actors' agency had a greater influence than others', and how some smallholders managed to be included in the making of certain decisions along the land use trajectories. We conclude that uneven distribution of means among opposing actors in land use decision-making can indeed lead to an imbalance of decision-making power and targeted use of means by those who have more means to exclude smallholders who have fewer means. However, this finding only applies in the situation of top-down interventions where actors' land use interests are mutually exclusive. In situations where actors' land use interests were compatible or where a mediator supported smallholders in land use negotiations, actors developed a collaboration or at least mutual respect despite uneven distribution of means.

2. Methods

2.1. Study Area and Case Selection

We adopted a comparative case study design, analysing and comparing actors' agency in the context of three different land use trajectories. Our study area is located in Tanintharyi Region, southern Myanmar (Figure 1). The area is a mix of forest and agricultural land, and land use has developed along various trajectories over the past 20 years. Within this area, we selected two villages for closer investigation. Village A has a predominantly Karen-Christian ethnic minority population, whereas Village B is mainly Burmese-Buddhist. The two villages are situated in different officially designated land zones. The study area contains large so-called Reserved Forest areas that were established under British colonial rule and today are administered by the central government's Department of Forestry [44] (the term "central" refers to the national-level government of Myanmar). Anyone who uses land classified as Reserved Forest without permission from the Department of Forestry is acting illegally (see Appendix A). However, local communities have been using these forests for their own purposes without official permission. Village A is located inside a Reserved Forest. Accordingly, land users here can so far not apply for a formal land use certificate. Village B is situated in a zone designated for agricultural purposes, where land users can apply for a formal land use certificate; but it is also just outside a Reserved Forest which in 2005 was even upgraded to a more strictly regulated Nature Reserve. Villages A and B have each experienced one separate and one shared land use trajectory (LUT):

(1) LUT 1, near Village A: Conversion of forest, shifting cultivation for subsistence, and some cash crop plantations to an oil palm concession managed by a military company.
(2) LUT 2, near Village B: In 2005, conversion of the inconsistently enforced Reserved Forest into a more rigorously enforced Nature Reserve (LUT 2a); 12 years later, establishment of a community forest in the buffer zone of the Nature Reserve, making the use of some forest products possible again (LUT 2b).
(3) LUT 3, in and around both villages: Expansion of private-sector commercial agriculture—predominantly cultivation of rubber and areca (betel) nut by various actors—at the expense of forest and shifting cultivation.

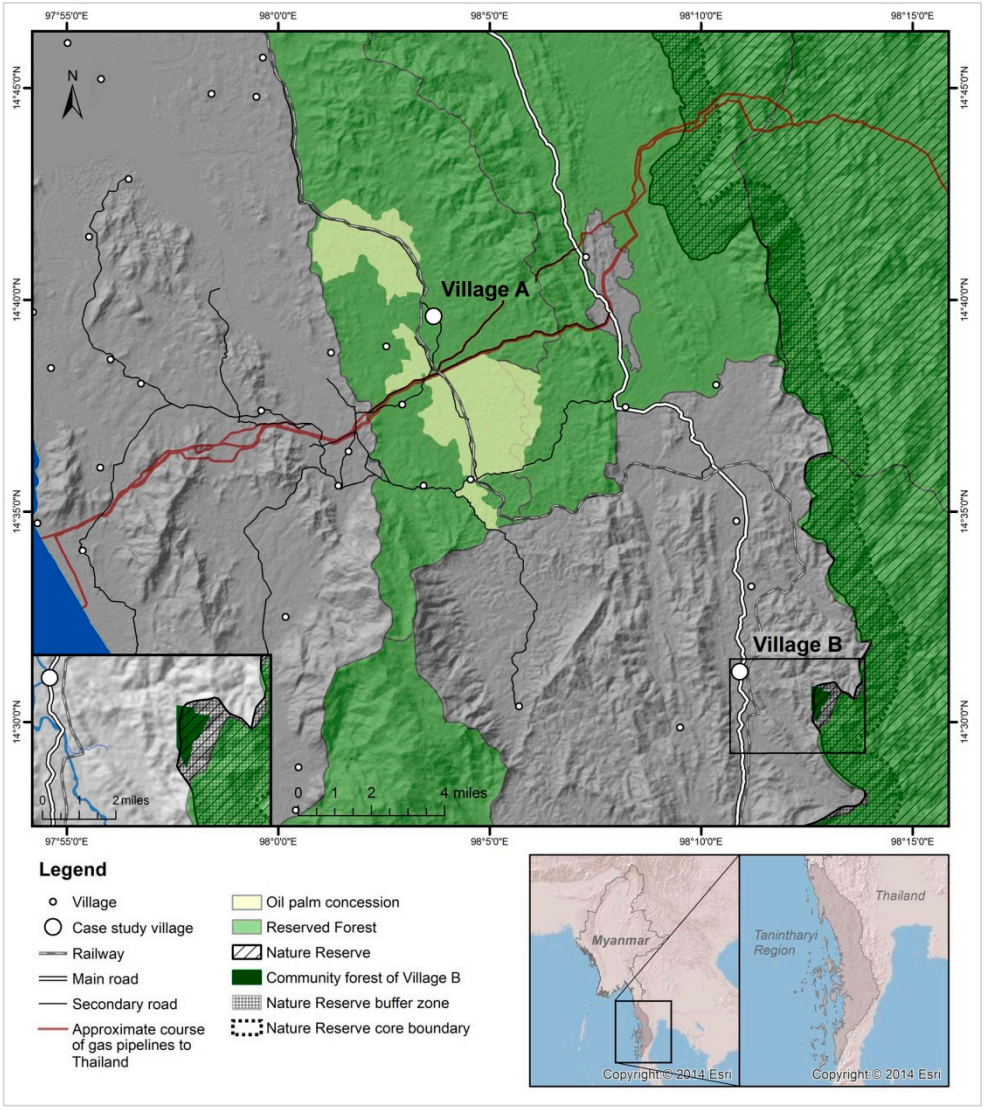

Figure 1. Map of the study area and case study villages in Tanintharyi Region, southern Myanmar, in the year 2018. Data sources: CDE 2018, MIMU 2015, ESRI 2014, NASA 2014, other anonymised sources.

This case selection is particularly suited to address our research questions, because the initial land use and land tenure situation was very similar in all cases, whereas they differ in their development over the past 20 years. In the late 1990s, the only local land users in all three cases were smallholders, who used the forested land for shifting cultivation, some permanent crop farming, and the collection of forest products. The land use and tenure system was largely customary, without any formal land use certificates for any of the land users. In all cases, external actors entered the land system and contributed to a change in land use decision-making and in land use. In all cases, these external actors had the necessary means to dominate the smallholders, but in some cases the smallholders nonetheless managed to be included in land use decision-making. Thus, the three land use trajectories comprise different actor interactions that show how actors' agency shaped the trajectories, starting from the same initial situation but achieving different outcomes of land use and land use decision-making. Comparison of the three cases enables us to draw conclusions as to why certain actors' agency had a greater influence than others', and why in some situations smallholders were included in land use decision-making even though they had fewer means than other actors.

Our cases are further influenced by another interesting aspect. Mirroring the turbulent history of civil war, both villages experienced many years of violent fighting between the ethnic political

organisation Karen National Union (KNU) and the Myanmar government's military as both parties claimed authority over the area. The KNU also formulated a land use policy in line with their own system and values (see Appendix A). Even today, the predominantly Karen population of Village A remains caught in the dilemma of which land use policies to adhere to—those of the KNU or those of the Myanmar central government.

2.2. Conceptual Framework for Analysing Actors' Actions and Reactions

To analyse actors' (re)actions in land use decision-making in LUTs and their agency shaping these (re)actions, we used a conceptual and analytical framework that draws on the human actor model of Wiesmann et al. [21], the understanding of action and agency of Eakin et al. [30] and Seto and Reenberg [35], and the concepts of capitals or means of Bennett et al. [43], Wiesmann et al. [21], and their sources. In this study, we focus on collective and organisational actors.

Figure 2 illustrates the basic features of the framework. An actor can interact with other actors, and they might mutually influence each other's actions and reactions. Actors are embedded in an institutional context, which may be the same or different for the various actors and influences their (re)actions. An actor's action or reaction is a dynamic interplay of activities and the actor's agency. Agency is comprised of two interdependent variables: The actor's goal or interests give meaning to the (re)action, whereas material and immaterial resources constitute the means that an actor has to (re)act. A (re)action comprises a number of individual activities. Based on Wiesmann et al. [21], Bennett et al. [43], and their sources, we differentiate between (1) natural means; (2) human means; (3) physical means; (4) financial means; (5) social means; and (6) institutional means. We characterised each of these means based on their distinct components (Appendix B).

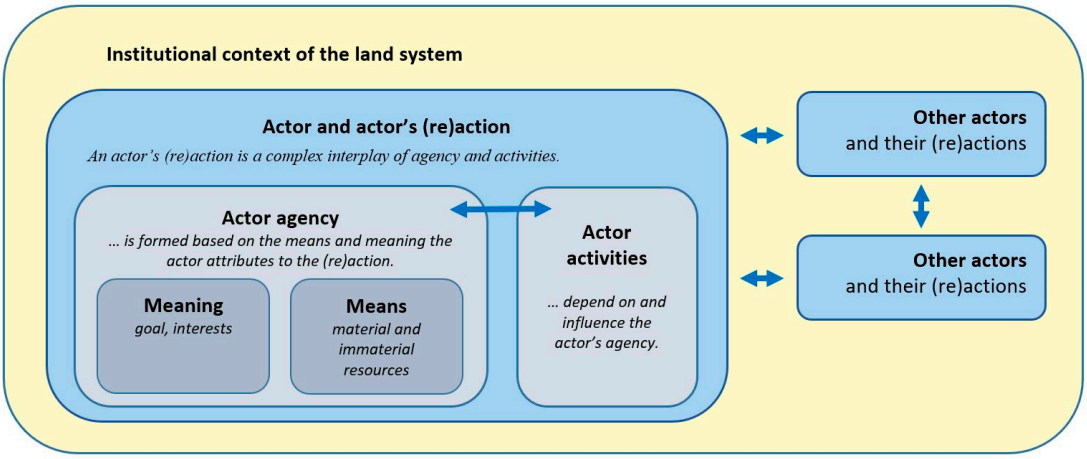

Figure 2. Actor (re)action framework: Actions and reactions of actors are understood as a complex interplay of their agency and activities. Actors' agency in turn is determined by the means and meanings they attribute to their (re)actions.

2.3. Data Collection and Analysis

Using this conceptual framework to structure the collection and analysis of qualitative data [45], we investigated all actors' actions and reactions involved in shaping the three selected land use trajectories in the study area. We started with two exploratory focus group discussions with local residents in each village (n = 11 to 28 participants) to identify key land use changes, their timelines, and actors involved. On this basis, we identified the following main collective and organisational actors, (1) smallholders previously practising shifting cultivation and now growing various crops (land < 15 ha, see Appendix C)), including village leaders; (2) regional entrepreneurs with diverse activity portfolios often including rubber plantations in various places; (3) a private agribusiness; (4) a military agro-industrial company with a concession for oil palm cultivation; (5) landless immigrants

and migrant workers; (6) the Nature Reserve Project (NRP); and (7) an international NGO that facilitates community forestry. We conducted a total of 31 semi-standardised interviews of 50 to 150 min each with representatives of these actors, collecting data on their activities, meanings, and means (see detailed agency components in Appendix B). We analysed the data from the focus group discussions and interviews using thematic coding and comparative content analysis. Where key data were missing or contradictory, we consulted further sources to enable triangulation. These included additional exploratory interviews with local actors and other experts and literature research.

Most interactions were conducted in a Myanmar language (Burmese) in teamwork by the first author of this paper and a research assistant; few were conducted in English. They were digitally recorded if participants agreed. The names of individual actors are kept anonymous to reduce the risk of repercussions. Data collection, analysis, and triangulation lasted from April 2016 to May 2018.

3. Results

3.1. Actors and Their (Re)Actions Shaping Land Use Trajectories

In this section, we present each actor's activities and agency in each land use trajectory. Table A3 in Appendix C gives an overview of the main actors involved and their agency. As mentioned earlier, smallholders were the only local actors before the examined land use trajectories unfolded. Over time, other actors entered the study area, engaged in land use decision-making, and became locally active actors as well.

3.1.1. LUT 1: Conversion to Military Oil Palm Concession in Village A

As part of its Self-Sufficiency Plan, the military government decided in the late 1990s to reduce its dependency on imports of cheap palm oil and foster domestic oil palm cultivation on a large scale in the Tanintharyi Region (see Appendix A). It granted military-owned or -related companies as well as other private companies medium- to large-scale concessions and motivated, or sometimes even requested them, to establish oil palm plantations. The concession areas were usually located in what was officially considered "unproductive wasteland" (later also referred to as vacant, fallow, or virgin land; see Appendix A) or in Reserved Forests. The government only sometimes considered the existence of villages or natural ecosystems in the designated concession areas. The KNU strongly disagreed with this development.

Actors and Their Activities

Around the year 2000, the military government granted an area of 12,140 ha to the predecessor of the company running the plantation today (see Table 1). The arriving company briefly informed the village leaders, but did not consult them. The villagers disagreed with the establishment of the concession, but they did not dare to defend their land as civil war was still ongoing and the village was already experiencing violent oppression by military forces due to other reasons. The company started planting oil palms on about 1800 ha while claiming the remaining area of over 10,000 ha of the concession contract for future expansion. In 2003, the concession was handed over to today's military agro-industrial company. Until 2010, this new company continuously expanded its plantations around Village A and other villages up to around 2750 ha (out of the originally permitted 12,140 ha) but did not relocate any villages. Various villagers lost access to parts or all of the land they had been using, as more and more land was converted into oil palm plantations. Those who had enough human and physical means cleared and cultivated other land in the vicinity of the village. After 2010, no more expansions by the military company have been observed (see Figure 1 for spatial extent). In 2011, the company signed a 30-year lease contract with the central Department of Forestry for the 2750 ha already converted and officially returned almost all of the remaining concession land (approx. 9000 ha) back to the Department of Forestry. Overall, this land use trajectory is an example of top-down interventions leading to abrupt changes in land use decision-making.

Table 1. Basic characteristics of land use trajectory (LUT) 1.

Land Zone [1]	Time	Actors Using the Land	Land Use	Spatiotemporal Dynamics	Territorial Claims and Consequences
Reserved Forest	Before the conversions, until late 1990s/2000 [2]	Smallholders in a customary land use and land tenure system [3]	Use of forest products, shifting cultivation, some cash crop plantations	Top-down abrupt change in land use decision-making, gradual change of land use due to large spatial scale	Previous and new actors both claimed the same land (company claimed larger area). Smallholders had to withdraw. Conflicts and resentments arose between the two actors.
	From approx. 2000 to today	Military company (first company approx. 2000–2002, second company 2003–today)	Large-scale oil palm concession, gradual clearing of forest and conversion of smallholders' shifting cultivation and plantations from approx. 2000 until 2010		

[1] Official land category defined by the central government. [2] Different sources provide different years; the concession was granted sometime between 1997 and 2000. [3] Administratively, the Department of Forestry would have been in charge of land use decision-making; however, smallholders were unaware of the legislation and decided on the ground how to use the land.

The company offered jobs to the surrounding villages' residents, but most villagers refused. Some villagers worked for the company on a very short-term basis, but no villager was permanently employed. The around 200 workers employed by the company were almost all migrant workers from other regions of Myanmar.

At the time of fieldwork in 2017, the company and smallholders both reported several previous conflicts, but no active ones. The company representatives stressed that they tried to avoid clashes with smallholders but had not succeeded in preventing all conflicts. The villagers in turn insisted that the land had originally belonged to the local people and that they wished for it to be returned.

Actors' Agency

The meanings behind the actors' actions and reactions diverged strongly. The goal of the military company was to produce palm oil for their own soap factory, providing affordable soap for the domestic market and military camps throughout Myanmar (see Table A3). Local smallholders, who were extraordinarily poor and affected by military forces' repression (unrelated to the company), strived to survive the civil war and produce enough food for their families by engaging in shifting cultivation for subsistence and few cash crops. They did not want to work on the military company's plantation, as they preferred to cultivate their own land and had no interest in collaborating with the company. The result was an influx of mostly poor and landless migrant workers from distant places who were eager to work for the company to improve their difficult livelihood situation.

The company and the smallholders also had very different means (see Table A3). Strong social connections gave the military company access to influential land use decision-makers in the central and regional government. This enabled the company to obtain the formal concession—its institutional means that enabled it to disregard smallholders' claims, who had no formal land use titles. Moreover, smallholders were intimidated by the company's proximity to the military, with the military forces' reputation among Karen people of being violent; this reputation of the military forces constituted an informal institutional means for the company. It explains smallholders' reactive attitude of withdrawing instead of proactively opposing the company even though the company did never make use of any military forces. The company then drew on its major financial means to implement the conversions, acquiring physical and human means and obtaining knowledge from governmental representatives as well as national and international study tours.

Smallholders, by contrast, had no formal land use titles apart from their customary system of oral agreements with witnesses. Accordingly, they had no official permit for their shifting cultivation and crop plantations outside the village centre or for their use of the forest (see Table A3). Given that the

area is a Reserved Forest, villagers' agricultural practices were formally even illegal (see Appendix A). Moreover, smallholders hardly had any access to financial means, nor did they own or have access to substantial physical or human means.

For the immigrant workers, who found the employment through their personal network, the situation offered an opportunity to generally increase their means.

3.1.2. LUT 2: Conversion to Nature Reserve and Later Community Forestry near Village B

In 1992, the first international oil and gas company entered a collaboration with Myanmar's central government to explore and produce natural gas for export to Thailand, despite disapproval of the KNU. Over the following years, several oil and gas companies settled in the study area. As environmental compensation for the pipelines to Bangkok crossing the so-called Myanmar Southern Forest Complex, three international oil and gas companies provided funding for the Nature Reserve Project (NRP), a central-level semi-governmental organisation at the Department of Forestry, tasked with establishing and maintaining a Nature Reserve. In 2005, the Nature Reserve was established on the area already designated as Reserved Forest (see Figure 1) and was entitled with the official land category of Protected Public Forest (for more background information on the Nature Reserve and Karen villages, see Appendix D).

Actors and Their Activities

Changes occurred in two phases (see Table 2). Before the establishment of the Nature Reserve, the villagers made full use of all forest products, hunted in the forest, and—due to population growth—continuously extended their shifting cultivation and plantations into what at that time was a Reserved Forest. The villagers managed and used the land and forest according to their customary system. In the first phase (LUT 2a), starting in 2005, NRP arrived as a new actor in the area and established the Nature Reserve several miles away from the settlement area of Village B. To our knowledge, there had not been any prior negotiation with local communities. However, NRP respected the already existing cultivations of smallholders. Over the first years, NRP held numerous information events and trainings for nearby villages, marked the boundaries, and set up ranger offices in villages. For villagers (and other land users), the establishment of the Nature Reserve meant that they were from that point on no longer allowed to use the forest for collecting timber and nontimber forest products or hunting, as well as to clear more forest for making forest land cultivable. Any trespassing and violating of rules could result in retribution. For security reasons, NRP rangers were not allowed to patrol in areas of active insurgency or fighting (inside the Nature Reserve), but they managed to build up law enforcement in the areas without insurgencies along the Western boundary of the Nature Reserve where Village B is located. Accordingly, people in this area increasingly refrained from forest use. This first phase of LUT 2 is thus another example of a top-down intervention leading to an abrupt change in land use decision-making.

In a later phase (LUT 2b), starting in 2015, an international NGO arrived in the Tanintharyi Region and opened an office near Village B. In collaboration with the Department of Forestry (including a memorandum of understanding) and NRP, this NGO conducted a series of information events in the area, motivating villages to apply for a community forestry (CF) certificate, which according to the law would have been possible since 1995. Like in many other regions, local villagers had not been aware of this possibility. With the intensified assistance, trainings, and funding from the NGO since 2015, Village B finally applied for a community forest in the buffer zone of the Nature Reserve (see Figure 1). NRP immediately agreed with their plans. In July 2017, the district-level Department of Forestry issued a 30-year land use certificate to the CF group. Thus this phase also led to an abrupt change in land use decision-making, but it was preceded by negotiations and consultations.

Table 2. Basic characteristics of land use trajectory (LUT) 2.

Land Zone [1]	Time	Actors Using the Land	Land Use	Spatiotemporal Dynamics	Territorial Claims and Consequences
Hills further away from main road: Reserved Forest, upgraded to Nature Reserve (legal land category: Protected Public Forest) in 2005 [2]	Before the conversions, until 2005 [1]	Smallholders in a customary land use and land tenure system [3]	Use of forest products, hunting, shifting cultivation, few cash crop plantations	Top-down abrupt change in land use decision-making, gradual change of land use due to large spatial scale	Previous and new actors both claimed the same land (NRP claimed larger area). Smallholders along the Nature Reserve boundary had to give up forest use. This led to resentments among smallholders, but no violent conflict.
	2005–2015 (LUT 2a)	The newly created Nature Reserve Project (NRP)	Nature Reserve as large-scale protected forest, use of forest products and forest encroachment no longer allowed [4]		
	Since 2015 (LUT 2b)	Community Forestry (CF) group (comprised of smallholders and other villagers), supported by an international NGO and NRP	Establishment of a medium-scale CF area in the buffer zone of the Nature Reserve for communal use of forest	Abrupt but previously negotiated change of land use decision-making and land use	The CF group claimed a specific area within the territory controlled by NRP. Collaboration developed among all actors.

[1] Official land category defined by the central government; [2] the land along the main road is in a different zone (agricultural land, vacant and fallow land). However, in this LUT we focus on the Reserved Forest and the designated Nature Reserve (official land category in the legislation is Protected Public Forest). [3] Administratively, the Department of Forestry would have been in charge of land use decision-making; however, smallholders were unaware of the legislation and decided on the ground how to use the land. [4] Any activities in the official buffer zone—the outermost mile of the Nature Reserve—must be approved by NRP. Inside the core zone of the Nature Reserve, all activity or trespassing is strictly prohibited.

Actors' Agency

In the first phase (LUT 2a), when NRP arrived, the meanings behind actors' actions differed. While NRP mainly aimed to conserve biodiversity in collaboration with local communities (see Table A3), smallholders were concerned with surviving the civil war and having enough food. Accordingly, most smallholders wanted to use the forest as a source of food, building material, and land for cultivation expansion, and some, additionally, as a source of income based on informal selling of timber. NRP was willing to collaborate with local communities, but took measures to discourage smallholders from contributing to deforestation and forest degradation.

The distribution of means between these two actors was strongly asymmetrical. The formal connections between the central Department of Forestry and the oil and gas companies enabled the foundation of semi-governmental NRP as a new actor in a public–private partnership. From the beginning, NRP found itself well embedded in a strong collaborative social network between the Department of Forestry, the oil and gas companies, and itself. In addition, NRP could rely on its institutional means, namely the official mandate to implement and maintain the formally designated Nature Reserve. Moreover, having obtained substantial financial means (see Table A3), NRP could acquire human and physical means to implement the Nature Reserve. The smallholders, having far fewer means, could not compete with this new actor for access to the forest. They had no formal institutional means to support their forest use, but rather acted according to their customary system. The arrival of NRP drastically reduced their access to natural and physical means from primary forest, and indirectly also to financial means. At the beginning they did not accept this, but then they gradually gave up the use of primary forest. Being unaware of the legal options they had under CF regulations, they did not yet consider applying for a community forest.

In the latter phase (LUT 2b), after the arrival of the international NGO in 2015, the meanings behind all involved actors' actions became compatible thanks to facilitation by the NGO. The NGO pursued the goal of empowering local people for sustainable forest management under the international REDD+

programme. Based on the formal CF Instructions under the Forest Law (see Appendix A) and with the support of the NGO, the CF group-to-be formulated its long-term interest in maintaining and using the forest's natural resources. This meaning aligned with NRP's meaning of conserving biodiversity in collaboration with local communities. Accordingly, NRP supported the endeavour of the CF group and the NGO to establish a community forest in the buffer zone of the Nature Reserve.

In this phase, too, the distribution of means among the actors was strongly asymmetrical (see Table A3). However, the actors did not use their means to compete with each other. The international NGO assisted the CF group in obtaining their ultimate institutional means: formal approval of their CF land use. The NGO did so by providing the group access to its social, human (knowledge and skills), and financial means. For instance, the NGO held several capacity building sessions with the CF group to inform them about their options and duties, assisted them with technical skills such as GPS geolocation for the CF application, supported them in communicating with the district Department of Forestry and other departments, and provided funding for purchasing tools needed for forest management.

3.1.3. LUT 3: Expansion of Private-Sector Commercial Agriculture in Both Villages

Actors and Their Activities

The private agribusiness in Village B was the first private actor to become considerably involved in commercial agriculture. The company had reacted to the government's Self-Sufficiency Plan and the 2000 to 2030 Master Plan for the Agriculture Sector (see Appendix A), which promoted the cultivation of oil palms in Tanintharyi Region. The regional government granted the company permission to cultivate so-called wasteland (later referred to as vacant, fallow, or virgin land, see Appendix A), which was mostly forested and unused by villagers. The agribusiness started in 1998 (see Table 3) with 105 ha at the outskirts of Village B, mostly growing oil palm except for 10 ha of rubber. Later, the company realised that palm oil was not a profitable business and concentrated on other crops instead. Continual expansions up to today's total area of 384 ha led to forest clearance, but not to conflict with villagers. The agribusiness and villagers have coexisted based on informal mutual consent, as the agribusiness supported the village with donations and exchanged frequently with the village leaders. With the establishment of the agribusiness, migrant workers from distant regions started to settle on the company's compound.

Table 3. Basic characteristics of land use trajectory (LUT) 3.

Land Zone [1]	Time	Actors Using the Land	Land Use	Spatiotemporal Dynamics	Territorial Claims and Consequences
Village A: Reserved Forest; Village B: Agricultural land, garden land, vacant and fallow land [2]	Before the conversions	Smallholders in a customary land use and land tenure system	Forest, use of forest products, shifting cultivation, some cash crop plantations	Gradual and patchy change of land use decision-making and land use	Previous and new actors both claimed land in the same area, but not the same plots. No major conflicts or resentments.
	From 1998 to today (in waves occurring around 1998, 2006, and 2011)	Smallholders (both villages), agribusiness (Village B), regional entrepreneurs (both villages)	Gradual and patchy expansion of private-sector commercial agriculture		

[1] Official land category defined by the central government; [2] the land on the hills towards the east was designated as Reserved Forest and since 2005 as Nature Reserve (Protected Public Forest). However, in this LUT 3 we focus on the agricultural land near the main road (see Figure 1).

In 2006, the agribusiness began to intensify rubber cultivation in response to institutional and economic incentives for rubber production created by the central government (see Appendix A). The incentives also attracted regional entrepreneurs from nearby towns, who acquired land at the

outskirts of both villages with the help of local land brokers and also began to cultivate rubber, though only on a small to medium scale. Around 2007, inspired by the agribusiness and the regional entrepreneurs, all of whom are part of the regional elite, some smallholders also began to cultivate rubber. They usually converted some of their shifting cultivation plots to rubber plantations. With this gradual development of commercial agriculture, more migrant workers settled in or near both villages, usually working for the agribusiness or regional entrepreneurs. After the devastating cyclone Nargis hit Myanmar at the latitude of Yangon in 2008, the number of landless migrants looking for a future in the south increased significantly.

The decrease in armed conflicts and the market liberalisations that took place after 2011, as well as land-related reforms carried out in 2012, triggered a third wave of expansion of commercial agriculture. Smallholders stated that rubber and the areca nut (betel nut) were the main new crops they had started to grow since 2011, alongside some old crops such as cashew nut, black pepper, or fruits. In 2014, the agribusiness also began to produce areca nuts as they fetched a more attractive return on investment and a more stable market price compared to rubber. None of the actors have so far succeeded in producing good-quality rubber. Almost all rubber producers stated that income from latex production was much lower than what they had expected when they began to grow rubber.

No major conflicts between the coexisting actors have been reported. The agribusiness as well as the regional entrepreneurs—the regional elite—respected the smallholders' customary land use system and in the predominantly Karen Village A also the KNU's land use policy. The smallholders in both villages did not really welcome the rather speculative land acquisitions by regional entrepreneurs, as they reduced the availability of unused land; but they did not oppose them either.

Actors' Agency

The meanings guiding actors' actions were compatible. All involved actors' actions and reactions were mainly driven by economic interests (see Table A3), and at the outset of this land use the trajectory of the availability of land was not yet a limiting aspect. Nonetheless, the reasons why actors developed similar meanings differed to some extent. Smallholders were unable to develop economic interests in commercial farming as long as more pressing problems such as food insecurity and civil war prevailed and markets were difficult to access. However, as the overall conditions improved, they began to strive for increased income generation in order to satisfy their basic needs and send their children to school. Regional entrepreneurs pursued economic interests not to satisfy their basic needs but to secure the livelihood improvements that their parents and they themselves had achieved (e.g., plantations, decent house, and increased financial income) and to further increase their resources to offer their children better prospects (mostly education). Some made speculative land purchases to further expand their investment. The private agribusiness, also driven by economic interests, additionally aimed at overall regional development. For instance, the main owner was also involved in regional trading associations, political consulting, health infrastructure and service development, and many more projects. Migrant workers from distant regions, also striving for more income, found a possibility to improve their basic livelihoods, similar to the smallholders. In addition, migrant workers hoped to earn enough money to eventually be able to buy their own land (some in their hometown and some in the study area).

The natural, human, physical, financial, and social means that the various actors owned or had access to increased proportionally to the migrant workers to the smallholders to the regional entrepreneurs to the agribusiness (see Table A3 in Appendix C). The distribution of institutional means, however, followed a different pattern: it depended on the village and the relevant official land zone. While all land users in Village B had reasonable formal tenure security for their plantations (see Table A3 in Appendix C), land users in Village A—including regional entrepreneurs—had never held formal land use certificates because Village A is located in a Reserved Forest where agriculture is officially illegal.

3.2. Comparative Analysis: Whose Agency Counted in Land Use Decision-Making and Why

Table 4 summarizes the results of the comparative analysis of the three land use trajectories studied. The trajectories show different patterns of agency. Looking at actor relations, the new actors were predominant in LUT 1 and LUT 2a, whereas smallholders exercised agency in a more pronounced manner in LUT 2b and LUT 3, resulting in peaceful coexistence among smallholders and new actors. Regarding territorial claims, one might expect that smallholders are excluded from decision-making when actors with more means claim the same land. This proved to be true in LUT 1 and LUT 2a. In LUT 2b, however, smallholders in the form of a CF group managed to be included in land use decision-making even though they claimed the same land as NRP, who had ample means. These and other differences can be attributed to the varying patterns of agency described in the following section.

Table 4. Comparison of actors' agency in land use trajectories (LUTs).

	LUT 1: Conversion to Oil Palm Concession	**LUT 2: Conversion of Forest Use**		**LUT 3: Expansion of Private-Sector Commercial Agriculture**
		LUT 2a: Conversion to Nature Reserve	**LUT 2b: Partial Conversion to Community Forestry (CF)**	
Actor relations in land use decision-making: Whose agency counted?	Predominance of military company, smallholders excluded	Predominance of Nature Reserve Project (NRP), smallholders excluded	Peaceful coexistence among all actors, all actors included	Peaceful coexistence among all actors, all actors included
Characteristics of land use decision-making process	Top-down intervention; actors claimed same land	Top-down intervention; actors claimed same land	Consultations and negotiations held; actors claimed same land	No interference, some consultations, actors claimed different plots of land
Meanings behind actors' (re)actions	Diverging: industrial production versus securing of livelihood	Diverging: conservation versus securing of livelihood	Compatible: community-based sustainable management of forest	Compatible: income generation, economic development
Means available for actors' (re)actions	Strong asymmetry, company used its means to establish oil palm plantations	Strong asymmetry, NRP used means to reduce smallholders' forest use	Strong asymmetry, NGO used means to facilitate increased access to means for CF group-to-be	Graded asymmetry, each actor used means without interfering with others' land
Main means that brought about the change in land use decision-making	(1) National-level formal land use permit (institutional means), achieved through social network (social means) (2) Financial means to ensure the other means (3) Intimidating reputation of military (company's institutional means)	(1) National-level formal mandate to implement the Nature Reserve (institutional means), achieved through social network (social means) (2) Financial means to ensure the other means for implementation, achieved through social means (NRP very close to oil and gas companies)	(1) District-level formal land use certificate (institutional means), achieved through social means (connection to NGO) (2) Human (knowledge) and financial means, achieved through social means (support from NGO)	(1) All means are similarly important; but access to financial means can help to ensure other necessary means

3.2.1. Role of Meaning

Among the four situations in the three LUTs (LUT 2 comprises two situations), we encountered two situations where actor interests (meanings ascribed to actions) diverged and two situations where they were compatible. In the two situations with diverging interests, we noted that smallholders had been excluded from land use decision-making. In LUT 1, the military company aimed to produce palm oil for soap manufacturing, while the smallholders' concern was to maintain their food security and survive the civil war involving various armed conflicts around their village. In this situation, the military company was using its means (see Table A3) to implement the land use changes against the smallholders' will. In LUT 2a, NRP implemented a Nature Reserve with the aim of biodiversity conservation, whereas the smallholders aimed at maintaining their food security. NRP excluded the smallholders from land use decision-making by gradually restricting their access to the forest,

making use of its vast means to successfully implement the Nature Reserve. Both situations represent a top-down intervention without prior negotiation where smallholders would have been involved.

In the two situations where actor interests were compatible, coexistence was peaceful and even constructive without any major top-down interventions. In LUT 2b, the NGO as well as the CF group-to-be both aimed at communal use of the forest. The NRP and the Department of Forestry both agreed with this, as long as the CF group complied with their rules and regulations for sustainable forest use. After approval of the community forest and the formation of a CF group, the smallholders were therefore no longer a competing actor for NRP, but rather a potential collaborator for improved forest management who pursued similar interests. Members of the CF group and the NRP forest rangers even stated that they now usually patrolled the forest together and that this was giving them increased satisfaction. In LUT 3, all actors indicated that they aimed to generate more income from their land use. As a rule, no actor interfered with any other land user. In many cases, actors even benefitted from each other: While smallholders perceived the agribusiness and regional entrepreneurs as economic innovators and important casual employers, the agribusiness and regional entrepreneurs partly relied on smallholders as casual labourers on their plantations. Even the migrant workers' interest in generating income to improve their livelihood did not conflict much with any other actor's interests, including those of the smallholders. Migrant workers usually worked permanently or at least seasonally on the plantations of the agribusiness and regional entrepreneurs. Smallholders were mostly interested in short-term casual labour on plantations, as they preferred to work on their own land (with few exceptions). When local smallholders or their children sought permanent or seasonal employment, they usually migrated to nearby Thailand, where wages were higher than in Myanmar.

3.2.2. Role of Means

The distribution of means among the actors was uneven in all four situations (see Table 4). New actors entering the land system usually had substantially more means than the local smallholders—with the exception of the migrant workers.

Comparison of all situations showed that institutional means were relevant in enabling actors to become land use decision-makers in three of them, namely in LUT 1, LUT 2a, and LUT 2b. In all three situations, the change in land use decision-making was abrupt. In LUT 1 and LUT 2a, smallholders did not own or have access to formal land titles issued by the central government, whereas the new actors held land use certificates or a mandate from the central government. In LUT 1, the military company used its concession to claim decision-making power over the land under concession, while the smallholders had no formal certificate to prove the rightfulness of their land use and tenure; what was much worse was that their activities were formally illegal according to Reserved Forest regulations, even though these regulations had never been strictly enforced (see Appendix A). In LUT 2a, NRP received a mandate from the central Department of Forestry to implement the Nature Reserve. This official mandate legitimised their appropriation of decision-making power over the designated forest, whereas in this case, too, the smallholders had no formal recognition of their use of the nearby forest to support their right to being included in decision-making. In both LUT 1 and LUT 2a, smallholders were excluded from land use decision-making because new actors brought formal institutions into a customary system—formal institutions that may have existed but until then had not been enforced in the study area. In LUT 2b, the very same smallholders who had been excluded in LUT 2a regained access to decision-making on the same forest by formally registering as a CF group and receiving a formal CF land use certificate. However, the CF group needed to comply with the national-level instructions for CF and Nature Reserve regulations. Thus, in all these situations, formal institutional means such as land titles—unlike informal, customary institutional means—where critical for actors to be included in or to dominate land use decision-making. As confirmed by several interview partners, the higher the level of the government authority issuing a land title, certificate, or mandate, the more power it gives its owner.

Strikingly, in all these situations, the actors' social means were crucial to obtaining formal land titles. In LUT 1, the military company was closely connected to the national- and regional-level committees in charge granting land concessions. In LUT 2a, NRP was closely connected to the forestry departments at all levels who decided, based on existing legislation, to implement the Nature Reserve. In LUT 2b, the CF group received access to substantial new means by collaborating closely with the NGO. Even in LUT 3, the agribusiness owner proved to be well-connected to the regional, district, and township governments, to whom he repeatedly applied for permission to cultivate "wasteland". These individuals and organisations thus seem to have used their social networks as instruments for obtaining the necessary formal land use certificates. Our findings show that access to social networks at higher administrative levels can be decisive when it comes to being included in or even dominating land use decision-making.

Further, in LUT 2b, access to knowledge (human means) was essential in enabling the CF group-to-be to apply for a community forest. One might argue that in LUT 1, LUT 2a, and LUT 3 knowledge about how to apply for a land use certificate was no less essential for actors to acquire their institutional means.

In LUT 3, where land use decision-making changed gradually in patches, all means were similarly important, and each actor acted according to the means they had and the meanings they attributed to their actions. Their peaceful coexistence may be explained by the fact that previous and new land users did not claim the same land, but rather acquired separate plots. However, it might also be connected to the circumstance that the new actors were from the same region and more familiar with and considerate of the conditions in which smallholders in the area live and work.

In all four situations, one type of means was relevant for the implementation of changes in land use, but not obviously relevant for bringing about changes in land use decision-making: financial means. Having decision-making power did not necessarily lead to an immediate change in land use. This was apparent in LUT 1 and LUT 2a, where the changes in land use happened gradually after land use decision-making had changed abruptly. Implementing land use changes required various types of means such as human (e.g., labour), physical (e.g., tools, saplings), and financial means. Financial means enabled actors to acquire the other types of means where necessary. Accordingly, access to financial capital is another particularly powerful means in land use competitions. For instance, the military company (LUT 1) was able to maintain and expand its plantations even though palm oil production was not profitable because it had access to income from other businesses and tax income. The NRP (LUT 2a) used its vast funds to hire project staff, conduct information events, and mark the Nature Reserve boundaries, for example. In LUT 3, actors with greater financial capital were able to acquire larger areas of land, hire labour, and access more or newer technologies for agricultural production and communication.

3.3. Inclusion of Smallholders' Agency in Land Use Decision-Making

Since the inclusion of smallholders in land use decision-making is important from the point of view of sustainable development, we sought to identify situations and conditions where smallholders' agency was, indeed, included in land use decision-making. The comparison of all actors' interactions revealed three circumstances that contributed to—but did not guarantee—smallholders being included in land use decision-making despite the presence of actors who had more means than the smallholders did:

First, having a formal land tenure certificate issued by the Myanmar government and being located in an agricultural land zone contributed to smallholders being able to decide about use of their own land. In Village B, which is located in an agricultural land zone, holders of either a "Form Seven" land use certificate (after 2012) or at least a crop tax receipt for the land they cultivated did not experience any dispossession by actors with more means. Some smallholders who had not paid the crop taxes (for various reasons) and therefore had no crop tax receipt were dispossessed by other land users with more means. In Village A, most land use activities of smallholders and regional

entrepreneurs are illegal because the land is in a Reserved Forest. For that reason, land users have so far never had a formal land title. Some smallholders in Village A reported that the KNU had started to issue land use certificates to Karen people to increase their land tenure security, and that smallholders greatly appreciated this. However, they also stressed that these certificates would be less legitimate before the Myanmar national law than a land use certificate issued by the Myanmar government.

Second, a mediating actor with considerable means (the NGO in LUT 2b) facilitated capacity building and constructive mediation on land use decision-making for actors with comparably few means (smallholders), who then formed a CF group (LUT 2b). This facilitating actor considerably improved the smallholders' inclusion in land use decision-making. However, this was only possible because there was a legal framework that all actors could refer to; in this case, the national Forest Law with the CF Instructions (see Appendix A).

Third, compatible land user interests (meanings ascribed to actions) facilitated collaboration (see also Section 3.2.1). Where coexisting actors had similar rather than mutually exclusive land use interests there was no conflict or exclusion. The collaboration of NRP with the CF group and the NGO (LUT 2b) and private-sector-based agricultural expansion (LUT 3) illustrate how a peaceful environment can stimulate constructive collaboration or at least mutual respect. In these two situations, the smallholders' agency had a substantial influence on land use decision-making.

4. Discussion

Myanmar has experienced profound transformations of land use systems and land governance, with different actors being included in or excluded from land use decision-making [1,2,4,6,11]. Development actors in Myanmar as well as land system scientists and sustainability scientists have broadly stressed the importance of understanding the agency of actors involved in—or excluded from—such transformations [21,22,30,32–34,37–39]: This knowledge is needed if we aim to promote the transformation of land governance towards sustainable development.

4.1. A Framework for Analysing Actors' Actions and Reactions Based on Their Agency

Overall, we perceived the applied actor (re)action framework as useful for understanding how and why actors shape land use changes in the short term and land use trajectories in the long term. The operationalisation of agency through meanings and means—with their various components (see Appendix B)—helped to capture both visible and invisible aspects of actions and reactions. As stated by Wiesmann et al. [21], we can only observe activities and, to some extent, means, but a (re)action encompasses more than just these visible aspects. Our framework's operationalisation of agency enabled us to disentangle the complexity of actions and reactions by identifying the visible aspects of activities and means while also capturing the invisible aspects of meanings and some types of means, such as institutional, social, and financial means, as well as knowledge. Insights into the subtle differences between different actors' agency improved our understanding of how and why some actors were included in land use decision-making whereas others were excluded, and hence, why some actors' agency had a greater influence on land use decision-making than others' did. These insights also enabled us to identify factors that made it possible for smallholders to be included in land use decision-making. Overall, our analysis helped us locate leverage points for sustainable development, as it captured past and current weak points in the land system, such as the formalisation of land titles or lack of social networks, knowledge, and financial capital among smallholders. However, the operationalisation of the framework also entailed some challenges for data collection. It is a time-consuming and lengthy process, especially if samples need to be large. Moreover, respondents must be willing and able to share their data, which might not always be the case in every context.

4.2. Leverage Points for Transforming Myanmar's Land Governance Towards Sustainable Development

The current Myanmar government is already undertaking many actions for transforming the land governance towards more sustainable development. As actors contribute to/steer transformations [21,37–40],

the conducted analysis of actors' agency in land use decision-making supported the identification of potential leverage points [41,42] for further supporting the transformation of this land system towards sustainable development. We have identified four leverage points. First, as experienced in LUT 2, where the interests of the competing actors (smallholders and NRP) regarding use of the same land diverged, a mediator (the NGO) facilitated constructive communication between the two parties and further actors, supported the identification of a shared interest, and improved smallholders' access to necessary means such as social networks, knowledge, financial capital, and finally formal land tenure, which they would not otherwise have been able to obtain. This finding is consistent with studies from other countries which showed how, for example in Cambodia, domestic and international NGOs supported local communities' resistance against large-scale land concessions [46] and exerted pressure on the government [47], or how, in Mozambique, NGOs collaborated with smallholders to avert land and water deals initiated by commercial investors [48]. Thus, even in conflictual large-scale land acquisitions, external actors can create advocacy support and mediators can assume the role of a facilitator [49]. In Sweden, mediators managed to support trust-building between actors, facilitate knowledge generation, and foster innovations for adaptive comanagement of wetlands [50]. Therefore, the targeted and preferably constructive involvement of such mediators—also referred to as bridging or boundary actors [50–52]—in land use decision-making and land governance negotiations could serve as a leverage point for transforming Myanmar's land governance towards greater sustainability.

Second, our results have shown that formal land tenure recognition was crucial. Those actors who owned or had access to formal land titles were able to dominate or at least be included in land use decision-making. Other studies from Myanmar have also criticised the lack of formal land tenure recognition for smallholders [11,12,18,53]. At the time of submission of this paper, the Myanmar government was undertaking various attempts to integrate traditional land use systems and the use of Reserved Forests in its laws. So far however, the institutional framework of the Myanmar government has formally recognised neither customary or communal land tenure arrangements nor the use of land in Reserved Forests—situations that are both widespread in Myanmar's ethnic regions [4,12,53,54]. This makes it impossible for many smallholders—like those in Village A—to access formal land tenure, thereby putting them at increased risk of expropriation and exclusion and limiting their access to credits and mortgages. However, some studies from Myanmar have demonstrated that the current institutional framework of formal land tenure recognition—"Form Seven" under the 2012 Farmland Law—is discriminatory against women and ethnic minorities [4,11,55]. Studies focusing on other developing countries in Southeast Asia and Africa have further highlighted that national attempts to formalize land may risk to open windows of opportunity for land speculation, elite capture, and legitimisation of state land, which in turn lead to poverty traps, as speculative or accumulative land acquisitions often happen at the expense of the more vulnerable groups [56–58]. These risks, and the importance of achieving good land tenure governance, are even greater in post-war countries, where institutional confusion still largely prevails and a variety of actors make claims on land tenure solutions as a crucial element of the peace process [57,59,60]. This is also the case in Myanmar. The formalisation of land titles including formal recognition of customary tenure system thus stand out as an important leverage point for transformation towards sustainable development. However, relevant procedures and impacts must be well-assessed, just, transparent, and monitored, and involved actors must be held accountable so as to prevent unsustainable trajectories like social exclusion or environmental degradation.

Third, we have seen in all LUTs that social networks played a crucial role in accessing the means needed to be able to participate in land use decision-making (e.g., formal land titles, knowledge, and financial capital). International conceptual and empirical studies underscore that social networks can have a strong influence on natural resource governance [61–64]. In Cambodia and Laos, for example, factors such as access to power, political networking, and connections to influential elites proved to be relevant in enabling citizens to successfully resist land grabbing [46,65]. Central or bridging actors [66,67] occupy an influential position in a social network and can become brokers for

transformations [68,69], as their networks enable them to mobilize specific actors and also a comparably large number of actors. Scholars and development practitioners likewise underline the crucial role of informal power holders (e.g., traditional or religious leaders, socially, economically, or politically influential elites, and respected experts) in transformations, as they can influence both their followers and formal power holders in one direction or another [70–73]. In Kenya, for example, a social network study managed to identify the bridging actors between coastal fishers and conservation organisations and thereby contributed to improving a socially accepted mode of conservation diffusion through more effective collaboration [74]. Based on our own results as well as similar findings from other studies, we consider targeted work with central or bridging actors in the role of brokers and with their social networks another considerable leverage point for supporting transformation of Myanmar's land governance towards sustainable development.

Finally, our results have shown that knowledge and financial capital were both useful means to access other means. Other studies provide similar findings. A study from Rwanda, for example, illustrated how financial capital was necessary for farmers to join associations that controlled fertile swamplands; this led to the exclusion of poorer households, who could not afford the membership fees [57]. In Chile, lack of access to loans prevented smallholders from entering the emerging fruit and vegetable business; as a result, most smallholders sold their land to entrepreneurs [75]. Smallholders in Vietnam and many other countries also lack knowledge of how to access land titles [76,77]. Accordingly, we argue that providing access to knowledge (e.g., land tenure options, agricultural techniques, credit options, etc.) and financial capital (e.g., microcredits) to actors who have comparably few means—such as smallholders or landless people—might serve as a further leverage point for enabling sustainable land use decision-making in Myanmar.

Nonetheless, our results also showed that LUT 1 and LUT 3 led to considerable environmental degradation (e.g., deforestation) and that LUT 1 and LUT 2a increased socioeconomic disparities (e.g., exclusion of smallholders from land use decision-making). Future land governance in Myanmar should therefore also endeavour to design sustainability-oriented regulations for land use decision-making and land use.

5. Conclusions

In this paper, we have presented an analysis of actors' actions and reactions, as well as the agency behind them, in land use decision-making along three land use trajectories in southern Myanmar. We identified whose agency—conceived as the meanings and means behind (re)actions—influenced land use decision-making at what stage of the trajectory, and why.

In situations where the previous and new actors all claimed the same or at least parts of the same area of land for their use, formal land tenure recognition was the decisive means that secured decision-making power over the relevant land. Such certificates were always obtained through social connections; knowledge was likewise needed to obtain formal land tenure recognition. Where previous and new actors claimed different land for their use and land use and land use decision-making changed gradually in patches, all means were equally important and each actor acted according to the means they had and the meanings they attributed to their actions. In all situations, financial means were useful in implementing land use changes because they enabled actors to acquire other necessary means.

In two situations, smallholders were excluded from land use decision-making as a result of a top-down intervention. This exclusion also concurred with the circumstance that the competing actors pursued mutually exclusive interests regarding use of the same land. In both these situations, those actors who had the stronger means dominated land use decision-making. In one of these situations, a mediator later facilitated the identification of compatible interests and supported the establishment of a constructive collaboration between the previously competing actors. Overall, the existence of shared interests among actors led to the development of a peaceful and constructive collaboration.

We can conclude that an uneven distribution of means among actors may indeed create a power imbalance, especially in the context of top-down interventions. However, it does not necessarily lead to

the exclusion of those with fewer means from land use decision-making or to any other disadvantages for them. Three circumstances increased the chances of smallholders with comparably weak means being included in land use decision-making: First, their access to formal land tenure recognition; second, support from a mediator in building knowledge and negotiating land use decision-making; and third, compatibility of the competing actors' interests.

In view of the global struggle for sustainability, we consider it the scientific community's responsibility to contribute to sustainable development with its research. From this study, we learnt that in order for sustainability science and land system science to be transformative, their proponents should further investigate actors' actions and agency, also in other fields than land governance, simply because actors influence transformations. Furthermore, we believe it is promising to critically analyse actors' interests (meanings attributed to action) and means, as well as the distribution of means among actors, with a special focus on social networks, power relations, sources of power, conditions of social and environmental justice, and the institutional context influencing actors. Regarding the study of land governance transformations in Myanmar, we see three priorities for further critical and transformative research. First, as shown in this study, formal land tenure recognition is vital for securing actors' access to land; but land formalisation can also have negative social and environmental impacts. It is therefore important to learn more about the implications of past and current land tenure formalisation processes and potentials for formally recognizing customary land tenure systems in Myanmar. Second, there is need for a better understanding of the social networks of near and distant actors in land governance. Knowing how actors are connected to which other actors, comprehending their agency in interactions, understanding what kinds of institutions influence them, and identifying key actors in the network would facilitate the identification and targeting of leverage points for transforming land governance towards sustainable development. In connection with the analysis of social networks, further research could focus on power relations in Myanmar's land governance. Third, if land governance transformation is to be oriented towards just and sustainable development, the transformation process itself requires further attention. Transdisciplinary approaches and concepts such as social learning might prove useful to identify enabling and hindering factors of collective (social) learning among current and potential key actors in land governance.

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Abbreviations

CF	community forestry
CSO	civil society organisation
GPS	global positioning system
KNU	Karen National Union
LUT	land use trajectory
NGO	nongovernmental organisation
NRP	Nature Reserve Project
REDD+	Reducing Emissions from Deforestation and Forest Degradation
VFV	vacant, fallow, and virgin (land)

Appendix A. Institutional Complexity in Myanmar

Land users in Myanmar are exposed to a complex conglomerate of overlapping and sometimes conflictive laws and policies [18]. This institutional complexity and opacity adds an additional layer of challenges for those who often neither understand nor benefit from legislation, such as smallholders or ethnic minorities. Table A1 summarizes some of the most relevant land-related laws and policies and their implications for land users. Some of the challenges inherent in the legal framework presented in Table A1 are discussed further below. The three land use trajectories examined in this study need to be understood against the backdrop of this dynamic institutional complexity.

Table A1. Main land-related laws and policies of Myanmar and their implications for land users.

Field	Law or Policy	Implications
Land zones	The multitude of laws and policies since 1850 generated an array of different land categorisations	There are 22 different land zones (land categories defined by the government) in Myanmar [6]. Depending on the land zone, a specific law or policy is binding and a government department is responsible for administering the land. Legal land use purposes are stated in the respective laws and policies. In some land zones, dwellers can be forcibly evicted [78].
Forest	Forest Law (1992) and Forest Policy (1995)	The law and policy define rules for governing the country's so far overexploited forests with a greater focus on conservation, sustainable use, and community participation [44]. However, the law still permits logging by specific actors to a certain degree [79].
	Community Forestry Instructions (1995, reformulated in 2016)	Local communities can apply for community forests to fulfil basic livelihood needs and reforest degraded forests [5,44].
Land acquisitions	"Wasteland Instructions" (1991) [1]	These instructions encouraged large-scale export-oriented plantations on "wasteland" [4] and provided agribusinesses with easier access it [5]. [2]
	Self-Sufficiency Plan (1990s)	The cultivation of oil palms and other food and industrial crops were strongly encouraged to reduce Myanmar's dependency on imports [2,3].
	2000–2030 Master Plan for the Agriculture Sector (2002)	The Ministry of Agriculture and Irrigation prioritised large-scale agriculture for industrial production, especially rubber, oil palm, and other strategic crops [2].
	Rubber boosting policies (2005/06)	In 2005, government quotas for rubber (45% of private harvest was reserved for government) were entirely abolished [15–17]. Moreover, with China's Opium Substitution Program in 2006, Chinese agribusinesses received financial incentives and enjoyed eased bureaucratic procedures in Northern Myanmar [5].
	Vacant, Fallow, and Virgin Land Management Law (2012)	Similar to the Wasteland Instructions (see above), this law made it possible to allocate any "vacant", "fallow", or "virgin" land to domestic or foreign investors [6]. [2]

Table A1. *Cont.*

Field	Law or Policy	Implications
Land use certificates	Farmland Law (2012)	The law created a (quasi) [3] private land use property right, providing official land use certificates to farmers [4]. However, the Farmland Law is not valid for "forest land" administered by the Department of Forestry, such as Reserved Forests.
	Forest Law (1992)	On some (but not all) "forest land" administered by the Department of Forestry, any person or company can apply for a permit to implement an economic project such as an agribusiness, but must then strictly adhere to the exact contents of the approval [80].
	Land Use Certificates of the Karen National Union (KNU)	Over the past few years, KNU's Agriculture Department has measured Karen people's agricultural land and issued land use certificates to provide more land tenure security to Karen people [81]. However, according to our interview partners, so far these certificates are not recognised by the Myanmar government.
Ethnic minority policy	KNU Land Policy (1974, amended in 2005 and 2014)	KNU's land policy of 2014 aims at promoting social progress, security, and justice in the management of land ownership. It claims to be in line with human rights standards, prioritizing the occupation and use rights of marginalised and vulnerable people and village communities. Moreover, it emphasizes the social and ecological functions of land, forests, fisheries, water, and related natural resources [81,82].

[1] Full title: Duties and Rights of the Central Committee for the Management of Cultivable Land, Fallow Land and Waste Land [4]. [2] According to Kenney-Lazar ([5], p. 6), "wastelands" were effectively defined as land without a land title, the same as "vacant, fallow and virgin lands" [6]. [3] Under certain circumstances, the government can rescind a land use certificate [4].

Even though the Forest Law of 1992 attempted at promoting sustainable development of forestland, several challenges remained. Reserved Forest land is a protected class of forestland that was primarily intended for the production of forest products, including community forestry [4]. Oberndorf [4] (p. 7) however highlighted the diverging worlds of practice in reality and theory in law: "Many areas of Reserved Forest land in the country have been converted to agricultural production by smallholder famers or village settlement without a change in the classification of the land. In many areas, land classified as Reserved Forest land on existing maps does not match current use. Rural populations that have traditionally used areas of Reserved Forest land for generations are technically in violation of the Forest Law, though local authorities have often granted permission to use these lands in the past". The Forest Law allows reclassification of forestland to accommodate actual use, but implementation is still pending [83]. Unlike Reserved Forests, Protected Public Forests are intended for conservation purposes. The mismatch between official land use regulations and actual land use is less prevalent in Protected Public Forests than in Reserved Forests, as they tend to be well demarcated [4]. However, the creation of a Protected Public Forest on land where communities have already established traditional livelihoods can be problematic [4,10].

In addition to the challenges related to forestlands, most of the laws and policies highlighted in Table A1 seem to have reduced smallholders' land tenure security and eased land acquisitions. Especially the "Wasteland Instructions" (1991) and the Vacant, Fallow, and Virgin Land Management Law (short VFV Law, 2012) weakened smallholders' land tenure. Both only recognised land as already being in use if farmers had official land use certificates, which most farmers in these land categories lacked—and still lack; accordingly, they acquired the status of "squatters" [12]. Ferguson [84] and Kelley-Lazar [5] argued that "wastelands" were a political land category used by the government to gain control over land and populations especially in ethnic minority areas and areas of insurgency. In 2012, the concept of "wastelands" was formalised in the VFV Law [4,5]. Over the past decades, "wastelands" or "vacant, fallow, and virgin lands" were preferably awarded to state-owned economic enterprises, joint ventures, corporations, or private individuals, regardless of the original landowner or customary traditions and laws [4,5]. Responding to pressures from civil society at the time of submission of this paper, the Myanmar government approved an amendment to the Vacant, Fallow, and Virgin Land Management Law of 2012 that excludes ethnic lands under customary systems from

the category of vacant, fallow, and virgin land. However, the exact interpretation and implementation of this amendment is pending.

Another challenge arose from several changes in the military government's national policies regarding oil palm and rubber concessions in the 1990s and 2000s. The Self-Sufficiency Plan and the 2000–2030 Master Plan for the Agriculture Sector aimed at turning Tanintharyi Region first into a "palm oil bowl" [2] and second into an area for rubber expansion [85]. With respect to palm oil, in the 1990s the Myanmar government needed to reduce its dependency on palm oil imports from other Southeast Asian countries [6]. Consequently, the government decided to become self-sufficient for palm oil, choosing the Tanintharyi Region as the most suitable region for oil palm cultivation due to its climatic conditions. With regard to rubber, in 1989 the government's State Law and Order Restoration Council (SLORC) allowed rubber producers to sell 55% of their latex on the private market—while the rest had to be sold to the government [16]. In 2005, these government quotas were entirely abolished [16], assumedly due to the government's intention to promote rubber as one of Myanmar's strategic cash crops [15]. In 2006, China and Myanmar agreed on China's Opium Substitution Programme, attracting many Chinese investors to northern Myanmar [2] and increasing demand for Myanmar rubber in China. Moreover, rubber prices increased throughout the 1990s and 2000s until 2011 [86]. Subsequently, companies with personal or business connections to the military were awarded large-scale land concessions for oil palm cultivation [2,3]. Additionally, over the following years the government created several financial incentives for rubber cultivation [5,15,16]. This Self-Sufficiency Plan in combination with the previously established land-acquisition-friendly legal environment prepared the ground for a series of large-scale land acquisitions in Tanintharyi Region.

Moreover, documentation of land titles has been inconsistent and unequal over the past decades. The Farmland Law (2012) introduced the "Form Seven" [18], the official land use certificate for farmers of any scale. A link between the Farmland Law and VFV Law eventually also permitted VFV lands to be reclassified as farmland [4], thus permitting VFV landholders to apply for such a land use certificate under the Farmland Law. However, land users whose plantations were officially located on Reserved Forest land were still not eligible to apply for "Form Seven" (source: personal communication, respondent anonymised). Prior to 2012, nothing like "Form Seven" had existed. Land users practised different forms of written documentation, such as tax receipts, "Form 105" (certified map), or booklets [18], or they arranged oral agreements with witnesses. Many land users still do not hold a "Form Seven" (due to pending applications or nonsuitability of land zone). For average residents like smallholders, the township-level Department of Agricultural Land Management and Statistics (DALMS)—previously called Settlement and Land Records Department (SLRD)—normally issues the "Form Seven" based on a mandate from the Committee of the Farmland Law (also called "Administrative Body of the Farmland Law") (source: personal communication, respondent anonymised).

Finally, the Karen National Union's Land Use Policy partly conflicts with the Myanmar government's land-related laws and policies. While some land users in the mixed-control area might prefer to adhere to the KNU's policy, others might prefer to follow the Myanmar government's legislation (source: personal communication, respondent anonymised). Adhering to both sides' legislations is rather challenging due to their different nature. This conflictual overlapping of different institutions adds another level of complexity to land governance.

It is also worth noting that until 2012 our case study area was called a "brown region", which was a governmental term for an area of mixed control between the Myanmar government and ethnic organisations usually involving active fighting [87]. The KNU and the military were heavily engaged in armed conflict until the first regional ceasefire agreement in 2012. During this time, law enforcement was almost impossible. On the one hand, some villagers made unrestricted use of natural resources to improve their livelihood, engaging both in legal activities and officially illegal activities like logging or mining. On the other hand, villagers often suffered human rights violations committed by new actors entering the area from outside, and these were never held accountable for their crimes. Depending

on the conflict situation, government staff sometimes did not dare to visit rural areas, including to measure cultivated land and hand out tax receipts that land users could have used to document government recognition of their land use (source: personal communication, respondent anonymised).

Appendix B. Overview of Agency Components in the Actor (Re) Action Framework

Table A2 provides an overview of how we operationalised agency components in our study.

Table A2. Overview of the definitions of agency components in this study.

Meaning	Means (Own or Have Access to Material and Immaterial Means) [1]					
	Natural Means	**Human Means**	**Physical Means**	**Financial Means**	**Social Means**	**Institutional Means**
Goals or interests actors pursue with their (re)action	Land, crops, forest, animals, etc.	Labour, knowledge, skills, etc.	Built infrastructure, machines, communication, transportation, etc.	Turnover, funding, remittances, credits, etc.	Social network, relationships, type of interaction, etc.	Land tenure (formal and informal), political status, cultural identity, etc.

[1] Means are defined according to Wiesmann, et al. [21], Bennett, et al. [43], and the sources they cite. In line with the grounded theory approach [88], we subsume political, institutional, and cultural means—different sources use different terms—under institutional means.

Appendix C. Overview of Main Actors and Their Agency

Table A3 summarizes the main actors involved in land use and land use decision-making across the three land use trajectories studied.

Table A3. Overview of the main actors and their agency across the three land use trajectories (LUTs) studied.

Actors	Meanings (Goals, Interests)	Material and Immaterial Means (That Actors Own or Have Access to)					
		Natural Means	**Human Means**	**Physical Means**	**Financial Means**	**Social Means**	**Institutional Means**
Locally involved actors **before** the studied LUTs evolved							
Smallholders before LUTs evolved	To have enough food and survive the civil war; some Karen fled to Thai refugee camps	Land for shifting cultivation of rice, sesame (for oil), and other subsistence crops, some cattle, few cash crops, very little mining, full access to forest	Help each other with cultivation, never hire labour, traditional knowledge (cultivation and other), almost no access to other knowledge	Road in bad condition, only bullock carts, no telephones, no electricity; road and vehicles improved in early 2000s	Very little income (approx. 20% of today's), no remittances, no credits; some were able to pawn gold	Social contacts outside nearby villages very limited, relationship to government officials almost inexistent	No formal land titles (only crop tax receipts at most) [1]; customary practices, almost no political representation; Karen (Village A) and Dawei-Burmese (Village B) ethnicity
Locally involved actors **during and after** the evolution of the LUTs							
Landless immigrants and migrant workers (LUT 1 and LUT 3)	To generate income for their basic livelihood, return home, and/or buy land	Usually no land apart from vegetable garden (0.2 ha), limited access to forest	Never hire labour, learn by doing, through instructions from peers or supervisors	Company employees: access to some resources via the company; Casual labourers in village: very few physical means	Income of USD 440 to 2200 per year and person [2]; no access to credits, but advance payment of salary possible; sending but no receiving of remittances	Access to employment only through social contacts (relatives and friends) at place of origin and destination, usually limited to personal network	Company employees: some have contract, some oral agreement; others: oral agreement; "outsider" status among villagers
Military agro-industrial company, production branch of military conglomerate (LUT 1)	Operational: to produce palm oil for soap manufacturing serving domestic market and military camps in Myanmar; strategic: follow objectives of conglomerate [3]	2748 ha of oil palm plantations confirmed in current contract, totally 3720 ha managed (incl. mill, roads, waterways, etc.); original concession covered 12,140 ha	13 permanent service staff, 160 plantation labourers (migrant workers) with contract, 25 casual labourers (locals); managers access cultivation knowledge via the government [4], Facebook, and other companies	Mill for raw palm oil production (10 t per hour), water pumps, machine-aided tools, electricity from 10 generators, internet via personal smartphone, relatively good transportation vehicles	Annual turnover of approx. USD 420,300, but no profit, therefore rather dissatisfied; access to funds from mother company, no need for access to credits	Top management closely connected to national and regional military elite and other influential national and regional actors	At first concession permit from central Department of Forestry, since 2011 30-year land lease contract; proximity to military, with military forces' reputation among Karen people of being intimidating and violent
Nature Reserve Project (NRP) (semi-governmental organisation) (LUT 2)	To conserve biodiversity and protect endangered species in collaboration with local communities	The Nature Reserve encompasses approx. 170,000 ha of forest (ranging from primary forest to heavily degraded forest and villages with their cropland)	Approx. 80 staff, of which 50% local project staff, 50% government staff; access to most types of knowledge when needed, receive technical support when needed	Good transportation vehicles, full communication equipment (incl. computer and internet), electricity at headquarters, access to generators for some local offices	International funding: USD 450,000 annually from three international oil and gas companies [5]	Close collaboration with departments of forestry at all levels, some collaboration with international NGOs, researchers, KNU, and local population, support from oil and gas companies	Land officially designated "Protected Public Forest" (under 1992 Forest Law), formal mandate from central Department of Forestry to implement the Nature Reserve

Table A3. *Cont.*

Actors	Meanings (Goals, Interests)	Material and Immaterial Means (That Actors Own or Have Access to)					
		Natural Means	Human Means	Physical Means	Financial Means	Social Means	Institutional Means
After 2015: International NGO (LUT 2)	To empower local people for sustainable forest landscapes in the Asia-Pacific region (under REDD+ programme)	Does not use forest; has facilitated 94 Community Forestry (CF) permissions covering a total of 20,234 ha in Myanmar (Jan 2018)	Myanmar office: 13 permanent, seven volunteer staff; Tanintharyi office: three staff; access to most types of knowledge when needed, skills of employees improved	Good transportation vehicles, full communication equipment (incl. computer and internet), electricity	International funding: USD 85,000 annually for the national CF programme; approx. USD 970,000 annually for all programmes	Close collaboration with departments of forestry at all levels, with other national and international NGOs, civil society organisations (CSOs), researchers, and local population	Nationally registered international NGO, viewed by local population as professional supporter
After 2016: Village B CF group (LUT 2)	To maintain and use natural resources over the long term	57 ha of community forest in the Nature Reserve buffer zone	25 member households; access to information and capacity development via the NGO	No physical infrastructure apart from personal resources, access to CF is difficult (no good paths)	USD 1390 seed money from NGO	Close collaboration with NGO; in exchange with Department of Forestry, NRP, and other CF groups in the region, elsewhere in Myanmar, and abroad (via NGO)	30-year CF certificate from district Department of Forestry; internal constitution (board, members, procedures etc.)
Smallholders today (LUT 3)	To generate income for their basic livelihood and children's education	Land for mostly cash crops only, some mixed cropping, approx. 50% less land accessible today than before, on average 7.4 ha (2–15 ha) [6], very limited access to forest	Some hire few labourers 2–3 times a year, some do not; cultivation knowledge from parents, peers, some training; access to market price (via traders); some training from CSOs and NGOs	Roads are reasonable, access to motorbikes and cars; telephones, but usually no use of internet; limited electricity from generators or solar panels	Annual household turnover (not profit) approx. USD 1400 from cash crops and casual labour [7], some access to informal credits with high interest rates, some people receive remittances	Contacts mostly through personal network, some loose contacts to government officials, CSOs and NGOs, traders, middle(wo)men, entrepreneurs, etc.	Village A: no change in land title situation; Village B: change in 2013 from weak land use recognition (crop tax receipts) to "Form Seven" land use certificate from township government; in both villages: increased political representation (incl. CSOs)
Regional entrepreneurs (do not live in the villages but use land there) (LUT 3)	To generate income and keep their land in order to maintain their established livelihood and offer their children a good future	Rubber plantations in different locations, small to medium scale (8–120 ha), some fallow land	Usually do not work on the plantations, hire permanent and/or casual labour; access to relevant knowledge (in Myanmar language), satisfactory (but not excellent) own and employee skills	Most have a car and motorbikes, and machines to aid cultivation; some have a water pump, internet via smartphone, and electricity at their headquarters	Annual turnover from rubber approx. USD 18,800 (USD 2600–44,300), unclear whether profitable or deficient; some have additional sources of income, all have access to credits	Well-connected among regional elite and traders, access to government officials, usually members of business-oriented rubber association, rather good relationship with local population	"Form Seven" from township government for all sites around Village B, but none around village A (Reserved Forest land); viewed by local population as innovators

Table A3. *Cont.*

Actors	Meanings (Goals, Interests)	Material and Immaterial Means (That Actors Own or Have Access to)					
		Natural Means	**Human Means**	**Physical Means**	**Financial Means**	**Social Means**	**Institutional Means**
Agribusiness (private company) (LUT 3)	Short-term: to generate income and improve produce quality; long-term: regional social and economic development	Owns over 400 ha, cultivates 384 ha (oil palm, rubber, areca palm, and others); started with 105 ha, continuously expanded; would prefer to cultivate more land to improve returns to scale	22 permanent staff, 48 seasonal or temporary staff; mostly migrant workers, some locals; access to relevant knowledge (in Myanmar language), satisfactory (but not excellent) own and employee skills	Small mill for raw palm oil production (3 t per 5 h), rubber processing (for air-dried sheets), machine-aided tools, water pumps, electricity from two generators, internet via personal smartphone, relatively good transportation vehicles	Annual turnover approx. USD 119,900; apparently not profitable, therefore dissatisfied; company owners have additional sources of income; no credits needed	Owners closely connected to regional elite and traders, high position in regional rubber association, politically active, good access to government, good relationship with local population	30-year land lease permit from regional government from the outset (applied in 1998, received in 2000); later additional land under "Form Seven"; viewed by local population as innovator and agribusiness expert

[1] However, crop tax receipts did not include shifting cultivation fallows, and farmers did not always register all cultivated plots because they could not afford to pay the taxes. [2] Household income depends on several factors, including (1) gender (women earn less); (2) how many people per household can work (including teenagers); (3) type of employment (permanent, seasonal, or casual); (4) position (supervisors earn more than other employees); (5) skills (special skills, like rubber harvesting, milling etc. are better paid); (6) other economic activities (e.g., selling of betel leaves, rubber saplings, etc. in spare time); and others; [3] The overall conglomerate's goals are (1) to guarantee the welfare of current and retired military servants and their families; (2) to create job opportunities for local people; and (3) to support regional development. [4] Usually via the Perennial Crops Division or the Perennial Crops Research and Development Centre (PCRDC) of the Ministry of Agriculture, Livestock, and Irrigation (MoALI). [5] More than three oil and gas companies run activities in the case study area; we count only those who effectively contribute to NRP. [6] We defined the maximum area farmed by smallholders to be 15 ha—rather than the internationally widespread 2 ha—because most smallholders in the two villages cultivated between 2 and 15 ha of land. We also encountered a small number of wealthier local medium-scale farmers, who cultivated 20–83 ha, as well as local entrepreneurs with a diverse portfolio of activities and diverse sources of income. However, as these two groups were not perceived as main actors by the focus group participants, we did not include them as actor categories in this study. [7] Annual turnovers reported ranged between USD 110 and USD 4150. Most smallholders nowadays also do casual labour for other plantation owners in order to increase their income.

Appendix D. The Nature Reserve and Karen Villages

As elaborated in Section 3.1.2, the Nature Reserve was established thanks to an environmental compensation for the pipelines to Bangkok crossing the so-called Myanmar Southern Forest Complex. Three international oil and gas companies provided funding for the Nature Reserve Project (NRP), a central-level semi-governmental organisation at the Department of Forestry, tasked with establishing and maintaining the Nature Reserve. Besides this environmental compensation, the international oil and gas companies also support Karen and non-Karen village development through corporate social responsibility programmes (in the area near the companies' compounds) such as infrastructure development, school construction, provision of medical teams, agricultural trainings, micro-finance programmes etc., which is greatly appreciated by the local villagers. For constructing the pipelines, most smallholders received financial compensation from the companies for the land they lost to the pipelines. However, one company has been accused of substantial human rights violations in Karen villages in connection with construction of the pipelines in the 1990s and early 2000s.

The KNU did not approve the settling of the oil and gas companies and the construction of the pipelines crossing the area for which the KNU claimed administrative authority. The Nature Reserve encompasses an area with predominantly Karen villages inside the reserve. NRP and KNU collaborate to a maximum degree to maintain peace. There are some diverging opinions between the two actors, however usually conflicts do not escalate. The Nature Reserve regulations (from being designated as Protected Public Forest under the Forest Law 1992) make the existence of villages and their land and forest use formally illegal. Several Karen villages inside the Nature Reserve do not approve the reserve and continue to practise their traditional, customary shifting cultivation and forest use. Moreover, the villagers argue that they do not need the Nature Reserve's regulations because their use of the forest is already sustainable. They call for community-based management of their natural environment instead of top-down implementation of Protected Public Forest.

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Paper III: The making of land use decisions, war, and state

Lundsgaard-Hansen et al. 2021

Land Use Science

The Making of Land Use Decisions, War, and State

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The Making of Land Use Decisions, War, and State

During a civil war and its aftermath, rival powerholders frequently engage in decision-making over land use, for example via land acquisitions or legal reforms. This paper explores how powerholders influence land use decision-making and what their engagement implies for territorial control. We analyse three cases of land use changes in Myanmar's south between 1990 and 2015, where the Myanmar state and an ethnic minority organization fought over territorial control. We gathered qualitative data with a mix of methods and visualised actor networks and institutions. Our analysis reveals that the state managed to increasingly control decision-making over local land use from a distance by employing actor alliances and institutions such as laws and incentives, whereas the ethnic organization lost influence. We conclude that engaging in land use decision-making plays a crucial role in influencing the outcomes of a civil war and that it represents a form of war- and state-making.

Keywords: Myanmar; land use decision-making; land use change; war-making; state-making; actor network

1. Introduction

Civil wars are widespread, cause tremendous suffering, impact negatively on economic development, political stability, and environment (Baumann & Kuemmerle, 2016; Sambanis, 2002). They typically involve the state and rebels as combatants competing over territorial control and sovereignty (Doyle & Sambanis, 2000). During subsequent periods of peacemaking, i.e. the transition from armed fighting to peace agreements with ceasefires (Doyle & Sambanis, 2000), powerholders such as states frequently attempt to secure further territorial control (Diepart & Dupuis, 2014; Klem, 2014). One way for rival powerholders to gain control over land and thus territory is by influencing decision-making processes over land use, land use changes (LUCs), land

access, and land tenure (Bassett & Gautier, 2014; Diepart & Dupuis, 2014; Klem, 2014) – phenomena which also constitute relevant fields of research in land system science (Global Land Programme, 2016; Verburg et al., 2013). In the present study, we refer to *land use decision-making* (LUDM) as all these collective processes in which decisions over access to and use of land are made by various interacting actors across scales and sectors. Unlike the more agent-based understanding of LUDM (emphasizing individual cognitive decision-making by land users), our governance-oriented understanding of LUDM thus focuses on issues such as the following: the role actor networks play in decision-making processes; what actors exert influence on others in these processes; what interests they pursue; and/or who is included in (or excluded from) a decision-making process. Similar to the concept of land access (Ribot & Peluso, 2003; Sikor & Lund, 2009), our governance-oriented understanding of LUDM also enables us to shed light on crucial aspects of power and authority. Social scientist Charles Tilly introduced the terms "war-making" and "state-making", both intertwined and describing processes in which powerholders try to eliminate or neutralize their rivals inside a certain territory (Castañeda et al., 2017). Compliant with Tilly's argument, state authorities have been found to delineate protected forests with the aim of controlling and weakening insurgent groups who live and operate within them (Peluso & Vandergeest, 2011). Similarly, scholars (e.g. Thein et al., 2018; Woods, 2011) have pointed out how, in recent decades, the Myanmar state used agricultural land acquisitions in the country's north to weaken its rivals. Similarly, in Indonesia and Colombia, large-scale oil palm plantations have been seen to increase the territorial power of the respective state (Schaffartzik et al., 2016; Vargas & Uribe, 2017).

Tilly does not provide a definition of the term "powerholder". In the present study, we use the term "powerholder" to refer to a political, armed organization that

holds and exerts political, economic, institutional, and social influence and control vis-à-vis other actors. Consequently, in the context of civil war, the powerholders are the state, on one side, and the opposing rebels, on the other, which represent and govern a certain segment of society. This understanding of the term powerholder makes it possible to include non-state actors and/or self-claimed governments in the analysis, setting aside the assumption that only state authorities can be the legitimate holders of power.

There are several ways in which powerholders can control and engage in LUDM to steer or determine eventual land use, access, or tenure. For instance, controlling LUDM involves territorial projects such as national parks or zones with special economic functions (Bassett & Gautier, 2014), land legalization processes, as well as violence (or threats thereof) (Peluso & Lund, 2011). Similarly, in ceasefire and post-war periods, powerholders often engage in land reforms (Samuels, 2006) and state territorialization projects including constructing strategic roads to previously isolated regions, delineating zones with changing land uses and demarcating forests (Klem, 2014; Peluso & Vandergeest, 2011).

To control LUDM via territorial projects, powerholders often rely on networks of actors that help govern local areas from a distance (Lestrelin 2011). Such "territorial alliances" composed of actors located in diverse social, institutional, and geographic locations can be decisive for territorial control (Bassett & Gautier, 2014). Territorial alliances can be driven from above, as in territorialization projects using large-scale land acquisitions granted by a state (Woods, 2011). Territorial alliances can also be locally-driven. In Senegal, for example, an alliance of farmers, NGOs, state bureaucrats, and traditional authorities managed to defend farmers' land from urban development (Bassett & Gautier, 2014). To understand the functioning of these networks of territorial

alliances and their role in LUDM, it is necessary to analyse the actors involved and their interests.

Formal and informal institutions, defined as rules governing the behaviour of actors, largely determine human–nature interactions (Biermann et al., 2009). For example, land reforms or making forests into protected areas alter how people use land and forests. In this way, institutions regulate territories and decision-making over their purpose (Sikor et al., 2013), and, thus, processes of LUDM. At the same time, powerholders can rely on, or even create, different institutions to achieve their aims.

In recent years, scholars have begun considering how state interests in civil war and ceasefire contexts influence LUCs such as commercial land acquisitions or delineation of protected areas, but there are still very few studies investigating possible links. Additionally, the existing literature rarely addresses the role of powerholder engagement in LUDM on the outcomes of civil wars. Further, there remains a lack of understanding of the actors involved in and excluded from LUDM, their interests and alliances, and the effects of institutions on land uses in times of war and ceasefire. Post-war, it is crucial for durable peace efforts to address questions of LUDM, including changes in land use, access, and tenure (Diepart & Dupuis, 2014; Unruh & Williams, 2013). To address such questions, post-war powerholders must first disentangle and understand their civil-war legacies and any reforms made in the immediate aftermath of war – the ceasefire period – before they can effectively negotiate and (re-)build a durable peace. For this, evidence of wartime, ceasefire period, and post-war LUDM is needed, including changes in land use, access, and tenure.

Against this background, the present article focuses on LUDM during wartime and the ceasefire period. Its overall goal is to explore (1) how rival powerholders make use of actor networks and institutions in order to influence LUDM; and (2) the

implications of their engagement in LUDM in terms of resulting territorial control. More specifically, our investigation focuses on Myanmar, which experienced a long civil war lasting from the 1960s until the early 2010s and then finally began a transition with various ceasefire agreements between 2011 and 2015 – accompanied by critical land reforms (see section 2). In a study of a typical conflict-ridden borderland, we analyse three cases of changing LUDM between 1990 and 2015 (covering wartime and the ceasefire period[1]). The study is guided by the following research questions: (A) *What were the main LUCs between 1990 and 2015?* (B) *What were the changes in LUDM leading to these main LUCs?* The latter research question will shed light on (i) which actors were involved in the changing LUDM by being part of the actor network that ultimately fostered the LUC; (ii) what overall agenda and interests these actors had when engaging in LUDM; (iii) who was eliminated from the changing LUDM; (iv) what institutions influenced the changing LUDM; and (v) who did or did not share and adhere to these institutions. In part one (section 4.1), we analyse each LUDM case individually. In part two (section 4.2), we compare the three cases of LUDM to capture implications of the powerholders' engagement in LUDM for their territorial control.

[1] This study both focuses on land issues and was carried out before the military coup of 1 February 2021. Hence, implications of this military coup on land use decision-making are not part of the analysis. However, in our discussion section, we reflect on possible interpretations of the results in light of the current unfolding crisis.

2. Context and case study

2.1. Historical background of the civil war and land governance in Myanmar

Lasting from the 1960s into the 2010s, Myanmar's civil war was one of the world's longest-running such conflicts (Brenner & Schulman, 2019). In 1962, General Ne Win seized power in a coup d'etat. He expanded the military by recruiting mainly Bamar males. This and later military regimes became markedly ethno-nationalist in their character, envisioning a unified Myanmar based on Bamar Buddhist identity (Jolliffe, 2016). The central state removed local governments of previously federal, ethnic states, and developed a deep military state. Shan, Kachin, Karen, and other ethnic armed movements rose in power and armed conflicts escalated dramatically across the country (Jolliffe, 2016). Likely, the civil war was rooted in the precolonial divide between the country's centre and its borderlands, according to which the ethnic majority of Bamar have lived and ruled in the centre of today's Myanmar and other ethnic groups have long governed themselves in the more mountainous regions of today's borderlands (Brenner & Schulman, 2019). British and later Japanese rule and occupation deepened this divide in various ways. Decided to be united in one multi-ethnic country following independence in 1948, the ethnic minorities in the mountainous borderlands grieved over their lack of influence in political decision-making, absence of development in their areas, and repression of their cultural and religious freedom, compared to the ethnic majority of the Bamar in the country's centre (Kramer, 2015). In contrast, the authoritarian Bamar-led regime developed a self-image of being the guardians of the Myanmar state, with the central military considered the main actor responsible for unifying all ethnic groups in one Myanmar (Brenner & Schulman, 2019; Jones, 2014). At the same time, the inequitable distribution of resources between the Burman centre and the resource-rich ethnic borderlands is believed to be the key driver of ethnic

conflict in Myanmar (Kramer, 2015). The military-led central state increasingly conducted so-called development projects in the borderlands such as agribusiness, resource extraction ventures (minerals, precious stones, natural gas etc.), and hydropower facilities (Buchanan et al., 2013). These projects typically exported the resources to provide revenue to the state as well as income to local-level commanders from the Myanmar military and rebel groups' splinter groups (Jolliffe, 2016). Several scholars and civil society representatives argue that the Myanmar military-led state used these development projects during civil war and ceasefires as a means to expand the state's influence into government-non-controlled areas of the borderlands (Barbesgaard, 2019; Buchanan et al., 2013; Ferguson, 2014; Gum Ja Htung, 2018; Kenney-Lazar, 2016; Thein et al., 2018; Woods, 2011a; Woods, 2019).

Following pro forma elections in November 2010, a quasi-civilian government ruled between 2011 and 2015, still under the strong influence of the military. It negotiated various regional ceasefire agreements after 2011 and oversaw a nationwide ceasefire agreement in 2015 (Lundsgaard-Hansen et al., 2018; Schneider et al., 2020). Once these ceasefire agreements were finally reached, conflicts declined between the Myanmar military and many (but not all) ethnic armed organizations (rebel groups), and internally displaced people and refugees returned to their homes in some areas. However, many still remain in provisional camps due to loss of land to land grabs during their absence, environmental damage of their natural resource base as a cause of war, fears of violence, eroded infrastructure or social institutions (Displacement Solutions, 2013; KHRG, 2019; Transnational Institute, 2017). The quasi-civilian government also issued several land-related reforms (Lundsgaard-Hansen et al., 2018; Schneider et al., 2020), which ushered in new land-related policies, laws, and committees aimed at managing land use and tenure centrally and formally (instead of

customarily). However, pre-ceasefire problematic laws, power structures, and institutions from the past were not dissolved (Conservation Alliance of Tanawthari, 2018; Franco et al., 2015; Kenney-Lazar, 2016; Mark, 2016; Oberndorf, 2012).

From 2016 to early 2021, Myanmar was led by a democratically elected civilian government, tasked with resolving manifold legacies from the civil war and ceasefire period, while still under the strong but largely hidden influence of the military. Centralization of state authority continued (Stokke & Aung, 2020) and land uses and changes implemented during war remained, including agricultural concessions and top-down conservation zones in the borderlands. Myanmar found itself mired in countless unresolved land disputes and a situation of legal pluralism and ambiguity (Mark, 2016); a common state of affairs among post-conflict societies (Unruh & Williams, 2013).

Since the most recent military coup on 1 February 2021, the country is again in turmoil, appearing on the brink of another civil war.

2.2. Civil war and land governance in the case study area

Our case study area is located in Yebyu Township, northern Tanintharyi Region, in Myanmar's south (see Figure 1). It is situated in one of the country's borderlands where armed conflict prevailed until 2011, in particular between two parties: the Myanmar state and the rebel group Karen National Union (KNU; an ethnic minority political organization) (Jolliffe, 2016). After independence, the Karen people's request to form their own state to obtain territorial sovereignty was ignored by the Burmese and British leaders, resulting in a Karen rebellion led by the KNU (Brouwer & van Wijk, 2013). The military coup in 1962 worsened the tensions. For decades, the two rivals fought for territorial control, first in various areas of Myanmar, and later mainly in the southeast of

Myanmar[2]. In the 1990s, the Myanmar military set up a main base in the case study area for several years, during which time Karen ethnic people suffered serious human rights violations by (Bamar) soldiers, including rape of women, torture, killing, and denying access to cultivated plots, markets, and food.[3] Moreover, in both case study villages (Bamar and Karen), residents were forced to provide food to troops on both sides, and were forced to work as porters or construction labourers for the Myanmar military.

The transformation to a quasi-civilian government in 2011/2012 led to the signing of a durable regional ceasefire agreement between the Myanmar state and the KNU – followed by a national agreement in 2015. At some point, the KNU altered its request and communicated in its strategic mission that there should be a Karen state with a just and fair territory and self-determination within the Federal Union of Myanmar (Karen National Union, 2018).

To date, northern Tanintharyi Region remains a mixed control area, meaning that both the Myanmar state as well as the KNU claim sovereignty over the territory[4]. The territory requested by the KNU is about three times the size of what the Myanmar state defines as the "Karen State", and includes Tanintharyi Region in Myanmar's south (for maps, see KHRG, 2018). Both factions have their own – in part rival – land

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[2] There are multiple armed Karen groups under the KNU. The composition and arrangements of these armed groups are highly complex. For more information on the KNU's history, internal problems, and arrangements with armed Karen groups see (Brouwer & van Wijk, 2013; Jolliffe, 2016).

[3] To our knowledge, the KNU never perpetrated such crimes on Bamar villages in this case study area.

[4] In some parts, there is even a third actor who claims sovereignty: the New Mon State party (NMSP).

governance systems. In our study area, ethnic Bamar villages usually follow the governance system of the Myanmar state, while Karen villages try to follow both systems.

2.3. Case study villages

In order to avoid exposing them to possible political repercussions or other consequences, we refer to our case study villages as Village A and Village B and do not share their exact location. Village A has a predominantly Karen-Christian population, whereas Village B is mainly Bamar-Buddhist. Village A lies in the immediate vicinity of an oil palm concession and in a zone considered ineligible for land use certificates (use rights) by the Myanmar state[5], having been previously officially declared a "Reserved Forest" area (a legacy from colonial times) without allowance for agricultural cultivation of land (see Figure 1). By contrast, residents of Village B can apply for formal land use certificates issued by the Myanmar state for agricultural use (since 2012), as it is situated in a zone where agriculture is legally permitted. Further, Village B is situated at the edge of a nature reserve.

[5] In recent years, the KNU has started offering land use certificates to farmers in Village A.

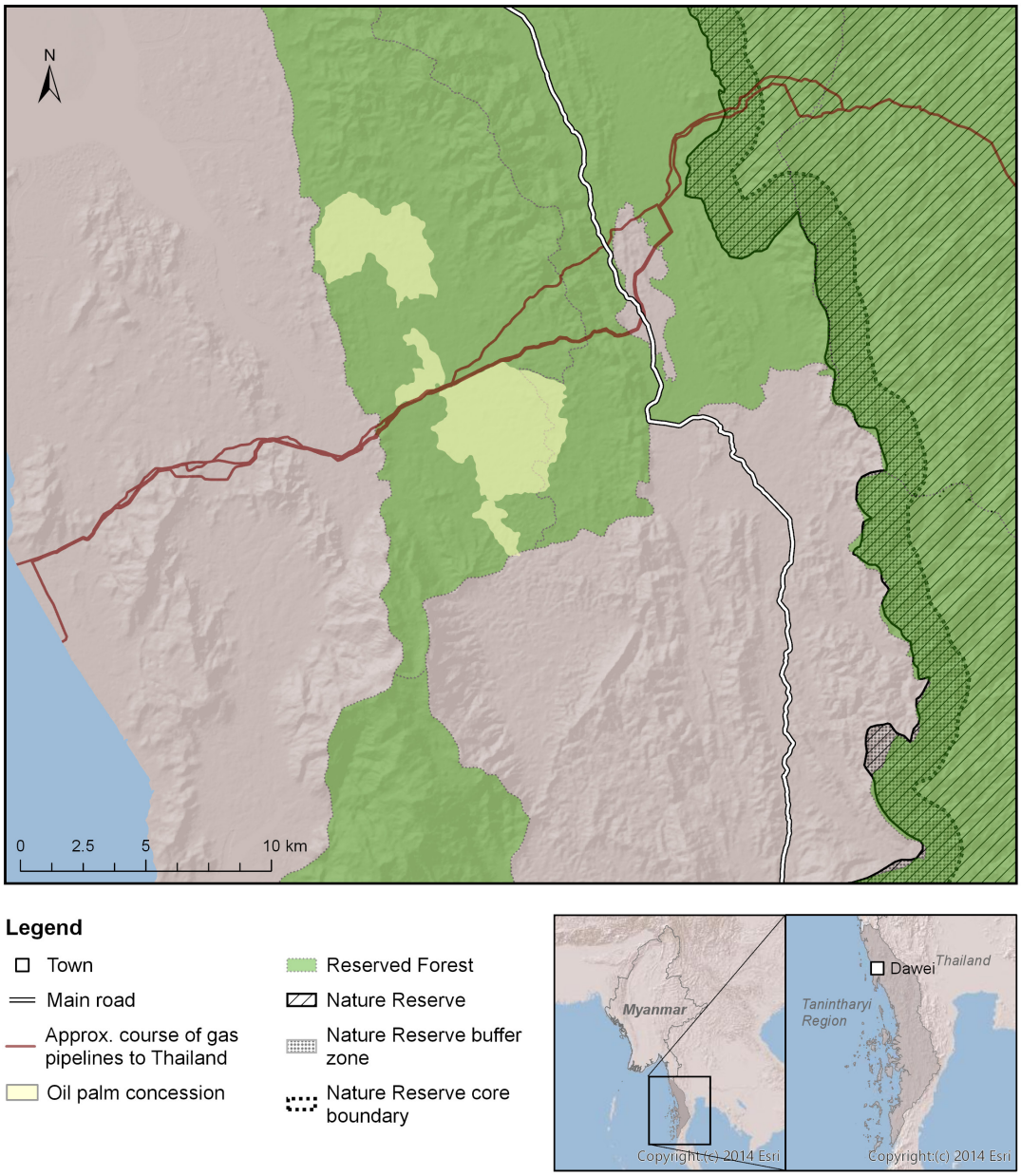

Figure 1: Map of case study area

3. Methodology

3.1. Conceptual framework

In the present study, we employ a governance-oriented understanding of LUDM. In so doing, we use the term LUDM to refer to all the collective processes, in which decisions over land use, LUCs, land access, and land tenure are made by various actors across scales and sectors. In this study, we conceive of land users as belonging to a dynamic

system in which various actors interact across scales and sectors while articulating claims to land. We argue that these actors pursue their own agenda when interacting with each other and that they adhere to a certain set of (formal and/or informal) institutions. Figure 2 illustrates how we conceptualize LUDM. In our conception, LUDM encompasses *inputs* to the decision-making process as well as the *process* of decision-making itself, in which various actors interact. The *output* of LUDM is a particular land use or a change thereof (an LUC), possibly including a change in land tenure or access, and thus control over land.

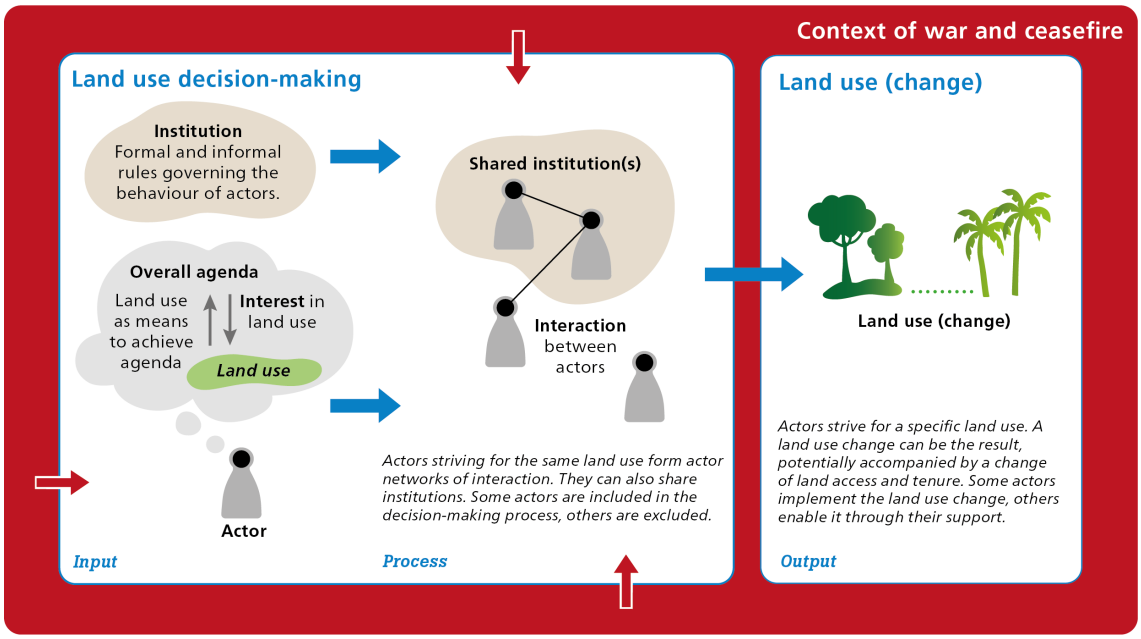

Figure 2: Conceptual framework of how land use decision-making leads to a particular land use or land use change, potentially including a change in land access and tenure (bolded terms form the major elements in the data analysis)

As *inputs* to LUDM (Figure 2, left side), two components are crucial: First, institutions can be formal such as written policies, laws, or land tenure rules; or they can be informal, such as traditional or customary rights (Biermann et al., 2009). Second,

actors are guided by their own stakes when engaging in LUDM (Lundsgaard-Hansen et al., 2018; Wiesmann et al., 2011). We differentiate between an actor's overall agenda (broader goal in the context of war and/or the ceasefire period, e.g. survival), on the one hand, and the actor's specific interest in a particular land use (e.g. subsistence food production), on the other, which helps to achieve his or her overall agenda (see Figure 2). Each actor generally has one overall agenda, but several narrower interests in various land uses.

During the *process* of decision-making (see Figure 2), actors can form networks of interactions (Borgatti et al., 2013; Fischer et al., 2017), which we refer to as "actor networks" (see 3.3.). In particular, the actors may form alliances (Bassett & Gautier, 2014) and collaborate towards implementation of common LUC when they have a shared interest in the same potential land use. At the same time, actors may jointly adhere to one or more shared institutions. Conversely, actors may be excluded from the decision-making process by not interacting (or by being prevented from interacting) in particular actor networks, or by not sharing certain institutions. The actors relevant to LUDM, and thus potentially included in such networks, range from local farmers to international organizations; the relevant institutions range from informal customary systems to national statuary laws. Notably, the temporal and spatial occurrence of decision-making processes varies widely. Key processes may occur to large extent in a single meeting, or they may slowly evolve over several years.

The *output* of LUDM (Figure 2, right side) is the realization of the envisaged land use and potential LUC, which can include changes in land tenure or land access, and thus in control over land.

In addition, the *context* such as war or ceasefire usually influences LUDM at any stage and time (Figure 2, red arrows) (Wiesmann et al., 2011).

3.2. Data collection

Data collection lasted from April 2016 to May 2018 and followed four steps. In the first step, we facilitated eight participatory focus group discussions in 2016–2017 in our two selected villages, including between 11 and 28 participants in each discussion (for selection of villages see Appendix A.1). The focus group participants were local residents (experienced farmers, elderly villagers, village heads, plantation workers), men and women alike, who represented particular land uses. In the discussions, we first identified the main LUCs (*outputs* of LUDM) in and around the villages from the perspective of participants (see Appendix A.3. for criteria of "main" LUCs). The spatial boundary was not precisely predetermined (e.g. administrative village boundary), but rather explicitly left open to enable local residents to interpret what they perceived as their village's surrounding[6]. We then collected data – during the focus group discussions – on the *process* of LUDM preceding each LUC by facilitating and recording a narrative dialogue about past events and by drawing causal loop diagrams. We did not predetermine the temporal starting point of analysis. Instead, the open narrative dialogue exercise revealed that all the main LUCs began occurring in the late 1990s. Only afterwards did we define the time points for the analysis (see section 3.3.). This procedure of narrative dialogue served (a) to establish a timeline of events for each case from its beginning; (b) to identify the new dominant actors (see definition below); and (c) to identify the initial land users before the changes occurred. Identification of the new dominant actors in LUDM and the initial pre-change land users gave us a starting set with which we could disentangle the wider network of actors involved in

[6] Administrative village boundaries are not precisely known by local residents in the case study area.

LUDM. Given the high importance of organizations in LUDM – particularly in terms of potential influence – we chose to focus our analysis on collective and organizational actors (Fischer et al., 2017) rather than on individual people.

In the second step, we conducted an actor survey to collect further data on the LUCs (the *outputs* of LUDM) and to investigate the *inputs* and *processes* of LUDM that led to the LUCs. The starting set were the dominant actors in LUDM as well as the initial land users as identified in the focus groups. From there, we applied a snowball sampling technique (Reed et al., 2009) to identify subsequent sets of actors from the first set of actors. We developed the survey in English and then translated it into Burmese. The survey included, among other aspects, questions on additional facts of the LUCs, the overall agenda of actors, their interest in certain land uses, their interactions with other actors (operationalized as exchanges of goods, financial capital, information, or human capital (based on Bennett et al., 2012; Wiesmann et al., 2011), as well as the formal and informal institutions to which they adhered (see survey structure in Appendix A.2.). The face-to-face survey sessions with respondents lasted 50–150 minutes. They were mainly conducted in Burmese and a few in English. Interviewees' responses about interactions and shared institutions were used to identify the next set of actors/respondents. We then repeated the snowball procedure with the newly identified actors, ultimately conducting a total of 68 actor surveys. Two aspects served to delimit the scope of the actor network and thus define the spatio-temporal boundaries of the system under study: Firstly, we applied relevancy criteria to data collection, as we explicitly chose not to predefine the boundaries of the actor network. In general, interactions (with the next actor) and institutions had to be directly or indirectly linked to and consequential for the LUCs under focus to qualify for inclusion (see Appendix A.3. for relevancy criteria). Secondly, practical considerations such as finite

time and money for travelling abroad placed limits on data collection, as did the lack of accessible data or respondents with respect to certain network actors (see Appendix A.4.).

Our third step involved filling in missing data on actors that were identified by the snowball procedure, but who did not respond to the survey, or did so only in part, as a result of lack of knowledge, refusal, or unavailability. Out of 78 actors in total contacted for the survey, 10 did not respond and 12 only partially responded (see Appendix A.5.). In order to fill gaps in our data and address uncertainties and contradictions, we conducted qualitative semi-structured expert interviews (44 face-to-face, 7 by phone) with third parties[7] (see Appendix A.5.) in addition to consulting scientific and grey literature. For example, the surveyed rubber smallholders and traders were unable to name and explain the Myanmar state's influential economic and institutional incentives for rubber production. Thus, we conducted interviews with several rubber experts in Myanmar to obtain data on these relevant institutions. See Appendix A.4. for more detailed information on procedures and actors related to data gaps.

Finally, in the fourth step – and as an added means of setting the spatio-temporal system boundary – we narrowed down for further analysis a selection of only those actors representing one of the following roles in the LUDM process or the resulting LUC:

[7] "Expert" refers to individuals with extended knowledge of the core topics, for example, based on having lived in the area for a long time (e.g. elderly villagers) or having conducted relevant research or policy advising over several years (e.g. university professor).

- *Powerholders* and their *armed forces*: In the present study, the term "powerholder" (Castañeda et al., 2017)[8] refers to the Myanmar state or the KNU, who competed over territory in southern Myanmar and continue to hold different forms of power over the territory and people. The Myanmar state, the KNU, and their respective armed forces are represented in the actor networks, regardless of whether they occupy a specific role vis-à-vis the LUDM or not. This is necessary to explore the powerholders' engagement in LUDM.
- *Initial land users* before any changes occurred: Smallholders in 1990 who mainly practiced shifting cultivation.
- *Dominant actors* in LUDM: (a) New land users and, thus, *implementers* of LUC: Those actors, who invested their resources to implement LUC, administered LUC, and claimed tenure of corresponding land. (b) *Key enablers*: Those actors without whose involvement in LUDM the LUC would not have been possible, for example by creating a decisive institution, providing critical funds.

Note that the initial land users, powerholders, and their armed forces can also be implementers and key enablers. For limitations of the study stemming from data collection, see section 5.2.

3.3. Data analysis

For the analysis, we also proceeded in four steps: First, we sought to identify the actors involved in and excluded from LUDM leading to the main LUCs. This analysis revealed how the rival powerholders made use of actor networks, which actors took

[8] "Rival" refers to the respective opponent of given actors: From the perspective of the Myanmar state, the KNU is/was the rival, and vice versa.

over decision-making from whom, and who was eliminated from decision-making. Second, we analysed the overall agenda and interests of those actors who newly dominated LUDM. Third, we scrutinized what formal and informal institutions the powerholders and other actors created or used when influencing decision-making. Fourth, we compared the three cases of LUDM.

Network diagrams

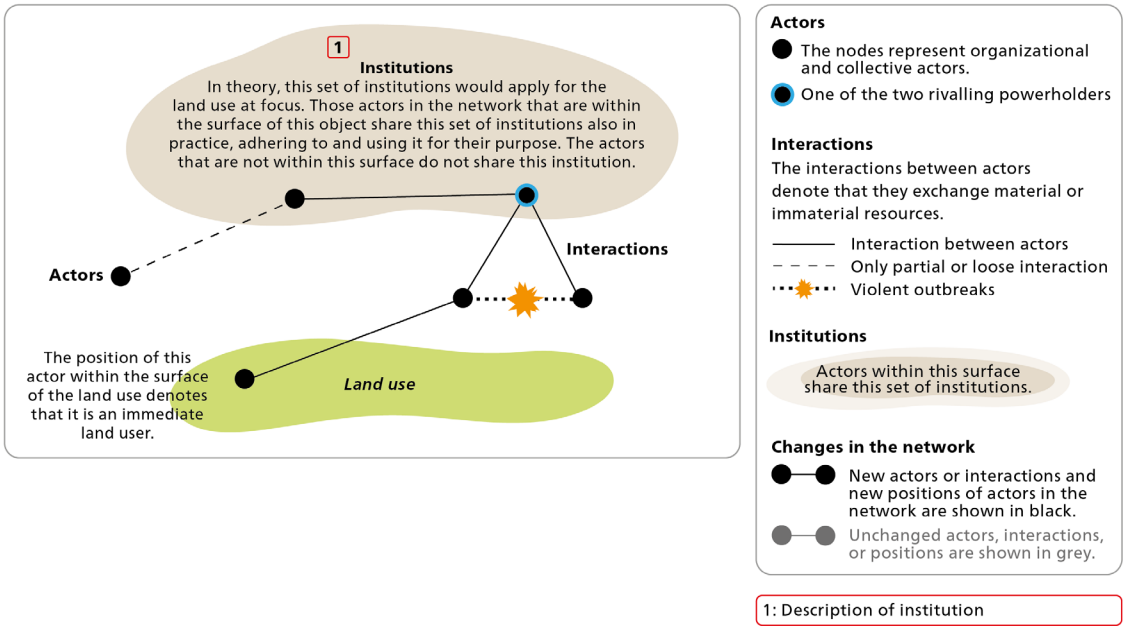

Figure 3: How to read the network diagrams visualizing actor networks and institutions in the land use decision-making process

Based on our conceptual framework, we visualized the *process* of LUDM in the form of a complemented actor network as shown in Figure 3. The following elements are integrated in the complemented actor network diagrams of LUDM (short: "network diagrams"): (i) The green "surface" beneath the actor network represents the land use resulting from the LUDM (output). (ii) The nodes represent the actors. The two powerholders are explicitly highlighted. (iii) The ties between actors represent interactions encompassing the exchange of goods, financial capital, information, and/or

human capital. (iv) The shades behind actors represent formal as well as informal institutions representing rules that in theory would apply to the land use under focus. Actors covered by a given shade adhere to and share that institution also in practice. Actors outside a given shade do not adhere to and share the institution in practice.

We analysed the LUDM at different time points (t) in order to see how the three cases of LUDM evolved over time. Based on the narrative dialogue exercise (see section 3.2.), we refer to the year 1990 as the "initial situation" of LUDM in the case study area, the years 1998–2010 as the "wartime" era when major changes began, and the years 2011–2015 as the "ceasefire period", as the warring parties in the case study area ceased to engage in armed conflict. Accordingly, the first time point (t_{is}) represents the initial situation of LUDM in 1990 (initial situation = $LUDM_{is}$). This baseline initial situation is identical in all three cases, as changes only occurred afterwards. Then, for each case of changing LUDM (oil palm = $LUDM_{op}$; nature reserve = $LUDM_{nr}$; commercial agriculture = $LUDM_{ca}$), the beginning is captured in 1998–2010 (wartime; t_{op1}, t_{nr1}, t_{ca1}). The later time points represent the situation of each LUDM case in 2011–2015 (ceasefire period; t_{op2}, t_{nr2}, t_{ca2}).

4. Results

Presented in a narrative style, the following subsections describe the *inputs* and the *process* of LUDM leading to the main LUCs. The narratives do so by highlighting the main actors in LUDM one after the other, as well as their overall agenda, their interest in particular land uses, and their interactions and shared institutions with other actors. In this way, the following subsections explain how the powerholders engaged in LUDM and how they eliminated or neutralized their respective rival. For a more detailed overview of the *inputs* to LUDM in each case, see Appendix B.

4.1. The three cases of changing land use decision-making

The *initial land users* in 1990 (smallholders) practiced mainly shifting cultivation and used some forest products. They were the only land users and thus the *dominant actors* in LUDM. They shared their communities' customary systems, practised by Karen ethnic people (Village A) in accordance with the customary system of the KNU[9] (t_{is}, Figure 4). The smallholders pursued the same overall agenda and interest in the initial land use across villages, namely that of surviving the civil war and having enough food.

Initial situation in both villages

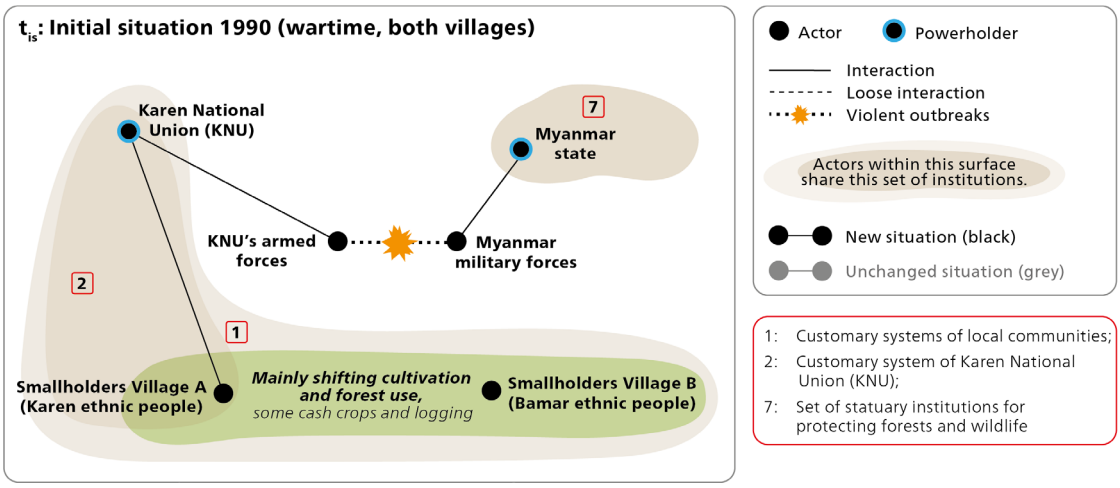

Figure 4: Initial situation of land use decision-making in both villages

In the initial situation around 1990 ($LUDM_{is}$), both powerholders (Myanmar state and KNU) claimed territorial control in the case study area. The KNU followed its overall agenda of a democratic, Federal Union of Myanmar guaranteeing the equality

[9] In addition to the customary system, the KNU had a formal land use policy. However, smallholders in the case study village did not refer to it.

and self-determination[10] of all ethnic nationalities, including the Karen people. Moreover, it aimed at a Karen state with a just and fair territory, independent within a hoped-for decentralized federation (Jolliffe, 2016; Karen National Union, 2015, 2018). Meanwhile, the Myanmar state pursued its overall agenda of building a united, disciplined, multi-ethnic nation, with the military (a synonym for the Myanmar state at that time) being perceived as the main actor for building this union (Brenner & Schulman, 2019; Jones, 2014). However, the Myanmar state was physically further away from the case study area than the KNU. Generally, smallholders in both villages had virtually no interaction with Myanmar state representatives. In Village A, smallholders interacted with KNU representatives.

In Village A, the KNU was a relevant actor at that time since it governed not only questions of land (thus influencing $LUDM_{is}$), but also those of social and cultural life (Jolliffe, 2016). Interpreting from literature, the main interest of the KNU in land use circa 1990 was most likely that of enabling all Karen and other ethnic people to use their land consistent with principles of self-determination and equality (Jolliffe, 2016; Karen National Union, 2018; Karen National Union, 2015).

In the early 1990s, the physical presence of armed troops sharply increased among both powerholders, partly connected to the LUCs that followed. Between the

[10] The KNU does not provide a description of what "self-determination" means in this context. Besides political independence of a Karen state within a federation, "self-determination" most likely also refers to land governance including the "recognition, restitution, protection, and support of the socially legitimate tenure rights of all Karen peoples and longstanding resident village communities […]" (Jolliffe, 2016, p. 77).

late 1990s and 2011, the KNU withdrew continuously towards the Thai border, operating with diminished links to its ethnic people in Village A.

In the focus groups, we identified three main LUCs. The changes in LUDM leading to these LUCs started in the 1990s and can be summarized as follows:

(1) $LUDM_{op}$ (only in Village A): A military company received a land concession and converted forest, shifting cultivation areas, and some smallholder cash crop plantations into a large-scale *oil palm* monoculture. Local smallholders lost access to land.

(2) $LUDM_{nr}$ (only in Village B): International oil and gas companies sponsored the implementation of a 170,000 hectare (ha) nature reserve (affording stricter protection status than the prior "Reserved Forest"). Conservation enforcement was low during the war but increased during the ceasefire period. A semi-state-owned conservation organization was in charge of implementing and monitoring the nature reserve. Smallholders gradually lost access to the forest.

(3) $LUDM_{ca}$ (in both villages): A regional private agribusiness, many regional land speculators, and local smallholders contributed to the expansion of private sector *commercial agriculture* – predominantly small- or medium-scale cultivation of rubber and betel nut – at the expense of forest and shifting cultivation.

4.1.1. Oil palm

Actors included in $LUDM_{op}$ and relevant institutions:

The *implementer* of the LUC and thus a *dominant actor* in $LUDM_{op}$ was a military company (see Figure 5) who had received a large-scale land concession from the Myanmar state in the late 1990s (and a more formal land lease contract in 2011). The military company was interested in producing palm oil for use in its own soap factory.

The company belonged to a military-owned conglomerate, which pursued the overall agenda of guaranteeing the welfare of military personnel and their families, in addition to creating jobs and supporting regional development.

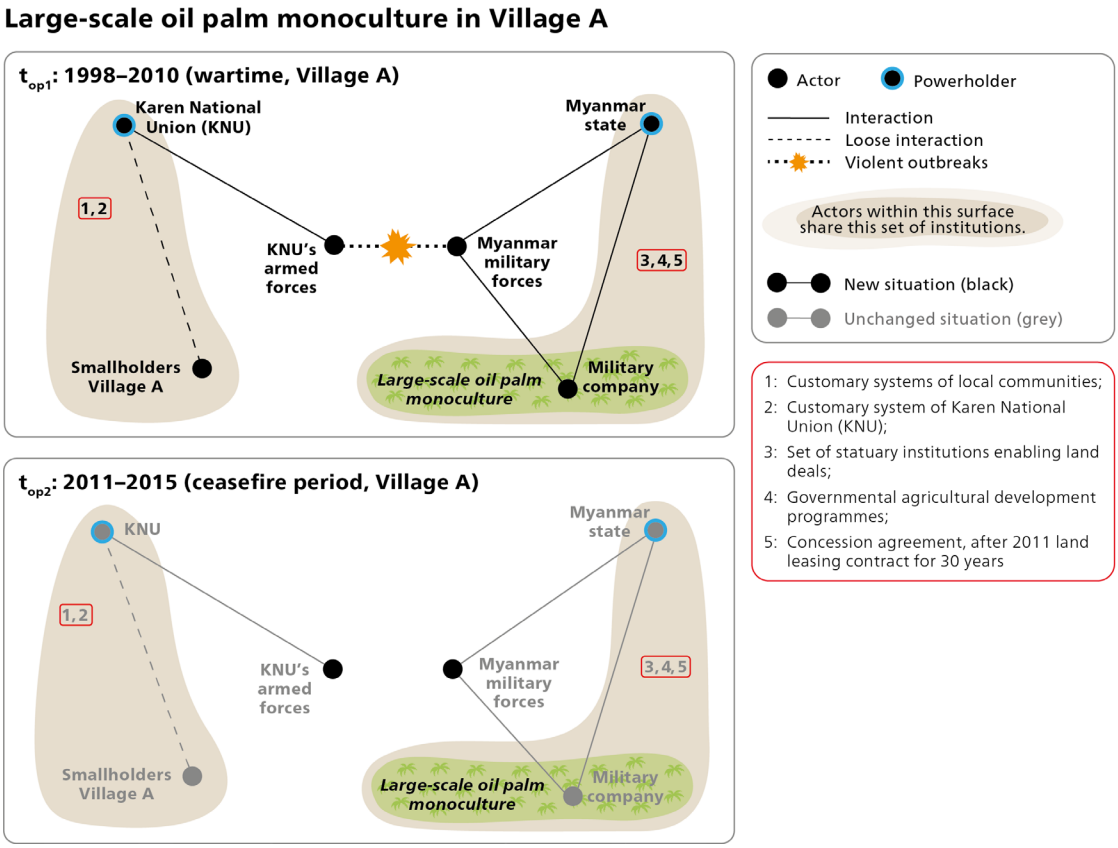

Figure 5: Land use decision-making over the large-scale oil palm monoculture around Village A (see also Appendix C.2. for more details on institutions)

The biggest *key enabler* and thus a *dominant actor* in $LUDM_{op}$ was the Myanmar state. Besides providing the land concession and lease contract to the company, the Myanmar state furnished other necessary institutions for this and other military-friendly companies to invest in oil palm cultivation in Tanintharyi Region (illustrated as shades in t_{op1}, Figure 5): A legal basis was facilitated with introduction of several land-related laws and state development programmes, paving the way for large-

scale, industrial investments in agriculture. The Myanmar state incentivized companies to invest in oil palm cultivation (e.g. privileges in accessing mills). Respondents also stated that the Myanmar state required companies to exploit a land acquisition in Tanintharyi Region in return for permissions for business activities elsewhere.

The Myanmar state pursued particular interests when issuing oil palm concessions in Tanintharyi Region: First, as officially communicated by authorities, the state aimed at reducing its dependency on palm oil imports from abroad, in line with a national self-sufficiency plan (Lundsgaard-Hansen et al., 2018). The state expected to strengthen domestic production for the domestic market. Second, as explained in expert interviews, the state planned to open up the government-non-controlled area with tree plantations, in order to build physical infrastructure (e.g. roads), improve access to the contested area, and thereby improve territorial control – as well as generating development and helping to pacify the region. Consequently, vast areas of Tanintharyi Region were conceded for oil palm cultivation, forest was cleared, and villages were resettled.

Myanmar's military forces were another *dominant actor* in LUDM. They provided security to the military company while it converted the land use, making the armed forces a *key enabler* of the LUC. Their interests in the oil palm monoculture in Village A are unclear, but the overall agenda of the Myanmar military in the case study area appears to be related to its "four cuts" strategy of cutting off the KNU from food, funds, information, and potential local recruits (Brenner & Schulman, 2019; Jolliffe, 2016; Woods, 2019).

Actors and institutions excluded from $LUDM_{op}$:

The *initial land users* (smallholders) did not agree with the LUC, but could not prevent it, as they were unable to tap into the military-dominated actor network of LUDM. They

did not need to relocate, since the oil palm monoculture spared the main settlement area. Those directly affected by the LUC either began cultivating other land further away or began working as causal labourers, but not for the military company (the smallholders refused offers of labour from the military company for ideological as well as financial reasons). Some also fled to Thai refugee camps due to almost simultaneous outbreaks of armed fighting and repression of Karen residents. Figure 5 illustrates their lost access to the previously used land (node sits outside the green surface) and to LUDM for this specific land use (node is not connected to the decision-making actor network).

The KNU also opposed the LUC but could not stop it either. The KNU was excluded from $LUDM_{op}$ as well (not connected to the actor network, Figure 5). The customary systems (informal institutions), which were omnipresent in the initial situation, were ignored in $LUDM_{op}$ (see Figure 5).

Summary $LUDM_{op}$:

Overall, $LUDM_{op}$ differs greatly from $LUDM_{is}$. The Myanmar state dominated $LUDM_{op}$, while the KNU was excluded. Further, the state managed to establish the physical presence of allies (military armed forces and military company) in the case study area via the LUC. In this way, the state increased its territorial control with $LUDM_{op}$, while the KNU lost some of its control over the same territory.

4.1.2. Nature reserve

Actors included in $LUDM_{nr}$ and relevant institutions:

In 1996, the Myanmar state decided to establish the nature reserve, but they could not formally found it until security and financial concerns were settled in 2005 (Schneider et al., 2020). Tasked by the Myanmar state, the *implementer* of the nature reserve and thus a *dominant actor* in $LUDM_{nr}$ was a semi-state-owned conservation organization

(see Figure 6). Based on its overall agenda of conserving biodiversity and protecting endangered species in collaboration with local communities, the conservation organization was genuinely interested in protecting the forest. During the war, implementation of the nature reserve was hampered by poor safety for staff. Following the regional ceasefire in 2012, however, the organization increasingly managed to implement the reserve, at least along most of the Western border of the reserve[11], where Village B is located.

A *key enabler* of the LUC and thus a *dominant actor* in $LUDM_{nr}$ were international oil and gas companies who made the nature reserve possible by substantially funding the conservation organization. Formally, this funding was part of a larger corporate social and environmental responsibility programme agreed with the Myanmar state, which explains the interest of the companies in the reserve. The environmental compensation was arranged in return for allowing company pipelines to cut through the biodiverse forest in order to deliver natural gas to Thailand (Schneider et al., 2020) – their overall agenda – as well as, to some extent, as a form of compensation for major human-rights violations in the early 1990s in connection with the pipeline construction (Barbesgaard, 2019; Lundsgaard-Hansen et al., 2018; Woods, 2019).

In the 1990s, Myanmar's military forces accompanied the companies as security, making it an indirect but *key enabler* of the LUC. The interests of Myanmar's

[11] Inside the nature reserve – a KNU stronghold – Karen villages continue their agricultural practices and forest use as they did before the conservation status was issued. However, given the new nature reserve regulations, the existence of the villages and their land and forest use are now formally illegal.

military forces in the nature reserve per se are unclear. However, the troops actively fought the KNU's armed forces, who posed a threat to the companies. The presence of Myanmar's military troops also strongly intimidated local communities. Karen civilians reported numerous human rights violations by soldiers.

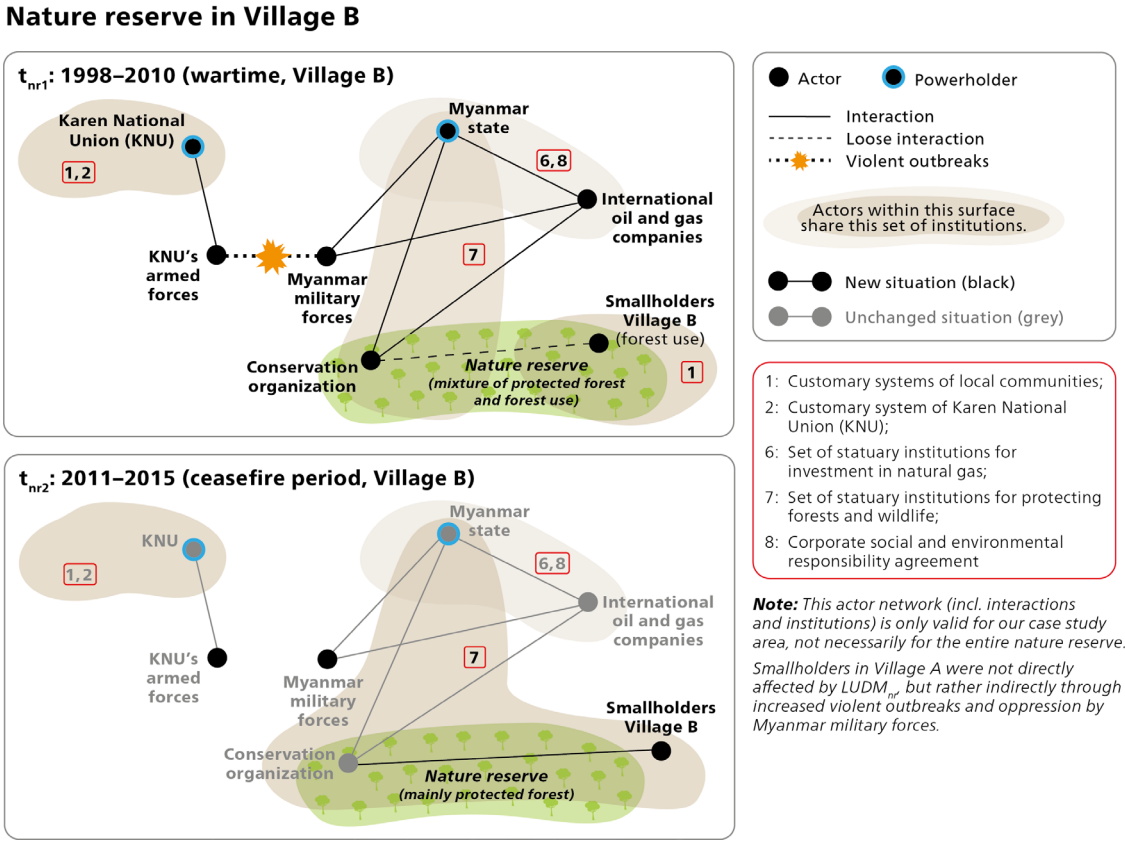

Figure 6: Land use decision-making for the nature reserve near Village B (see also Appendix C.2. for more details on institutions)

Again, the Myanmar state was a *key enabler* of the LUC and thus a *dominant actor* in $LUDM_{nr}$. The corporate responsibility programme agreed upon by companies and the state (and created by the latter) represented a relevant formal institution for $LUDM_{nr}$. Further, the Myanmar state provided the legal framework – including new forest-related laws – for creation of the nature reserve (see list of institutions in Figure 6). Overall, the Myanmar state had a vital interest in selling natural gas as a

crucial source of state income, as did some military generals who pocketed considerable sums (Barbesgaard, 2019). At the same time, surveyed state department staff confirmed the state's interest in better controlling and conserving forest resources due to high rates of deforestation in Myanmar. Notably, the forests designated for official protection were situated in the area where Karen ethnic people lived and the KNU operated. Whether the Myanmar state purposefully sought to classify the KNU stronghold as a conservation zone and therewith make existing Karen villages illegal was not openly expressed by any of our respondents. Nevertheless, other authors argue that "green territoriality" was one strategy used by the Myanmar state to weaken the KNU (Woods, 2019).

Actors and institutions excluded from $LUDM_{nr}$:

During civil war, the *initial land users* (smallholders) in Village B did not obey the restrictions on forest use inside the new nature reserve (node is still inside the green surface, t_{nr1}, Figure 6). Only with the increased presence of the conservation organization after 2012 (due to heightened security), did the smallholders increasingly draw back from forest use inside the reserve, for fear of punishment. Accordingly, smallholders lost access to the forest inside the reserve (node lies outside the green surface, t_{nr2}, Figure 6). However, they did not need to relocate further, as their village had already been forcefully moved (per order of the Myanmar state) from the inner forest to the main road in the course of civil war before 1990.

There was no prior informed consent with the KNU and the KNU disagreed with the forest protection status, since many Karen villages were located inside the demarcated zone. However, they could not prevent it from being issued.

Summary $LUDM_{nr}$:

Overall, $LUDM_{nr}$ differs greatly from $LUDM_{is}$. As in $LUDM_{op}$, the Myanmar state dominated in $LUDM_{nr}$, while the KNU was excluded. Once more, the Myanmar state increased the physical presence of its allies in the case study area via LUC. In this way, the state increased its territorial control. Notably, the situation might be different in villages located inside the nature reserve, the KNU stronghold area (see section 5.1.).

4.1.3. Commercial agriculture

Actors included in $LUDM_{ca}$ and relevant institutions:

Over the course of nearly 20 years, a variety of actors became *implementers* of the LUC from shifting cultivation/forest to commercial agriculture. Beginning in the late 1990s and in the 2000s (t_{ca1}, Figure 7), in particular a private sector agribusiness and countless regional land speculators (drawing especially urban elites) became *implementers* of the LUC. They all became pioneering *dominant actors* in $LUDM_{ca}$. According to their statements, they responded to state-made incentives (see shades of institutions 3, 4 and 9 in t_{ca1}, Figure 7) regarding land possession, commercial agriculture (such as abolishing rubber quotas; Lundsgaard-Hansen et al., 2018), or the announcement of the Special Economic Zone nearby (causing land prices to skyrocket). Moreover, they responded to the perceived promise of "white gold", that is, rubber. While respecting the local communities' customary system of land tenure, the agribusiness and speculators converted forest to cash crop monocultures, usually on the outskirts of the villages. While the agribusiness was rather interested in generating wealth through a commercial business, the land speculators' interests were in acquiring land as a promising long-term investment, in addition to earning money by selling rubber liquid in the medium-term. When asked about their overall agenda, they all cited wanting to ensure a prosperous future for their children. Some smallholders also joined the LUC as

well at this stage, but they were few in number (illustrated by their node just at the edge of the green surface, t_{ca1}, Figure 7).

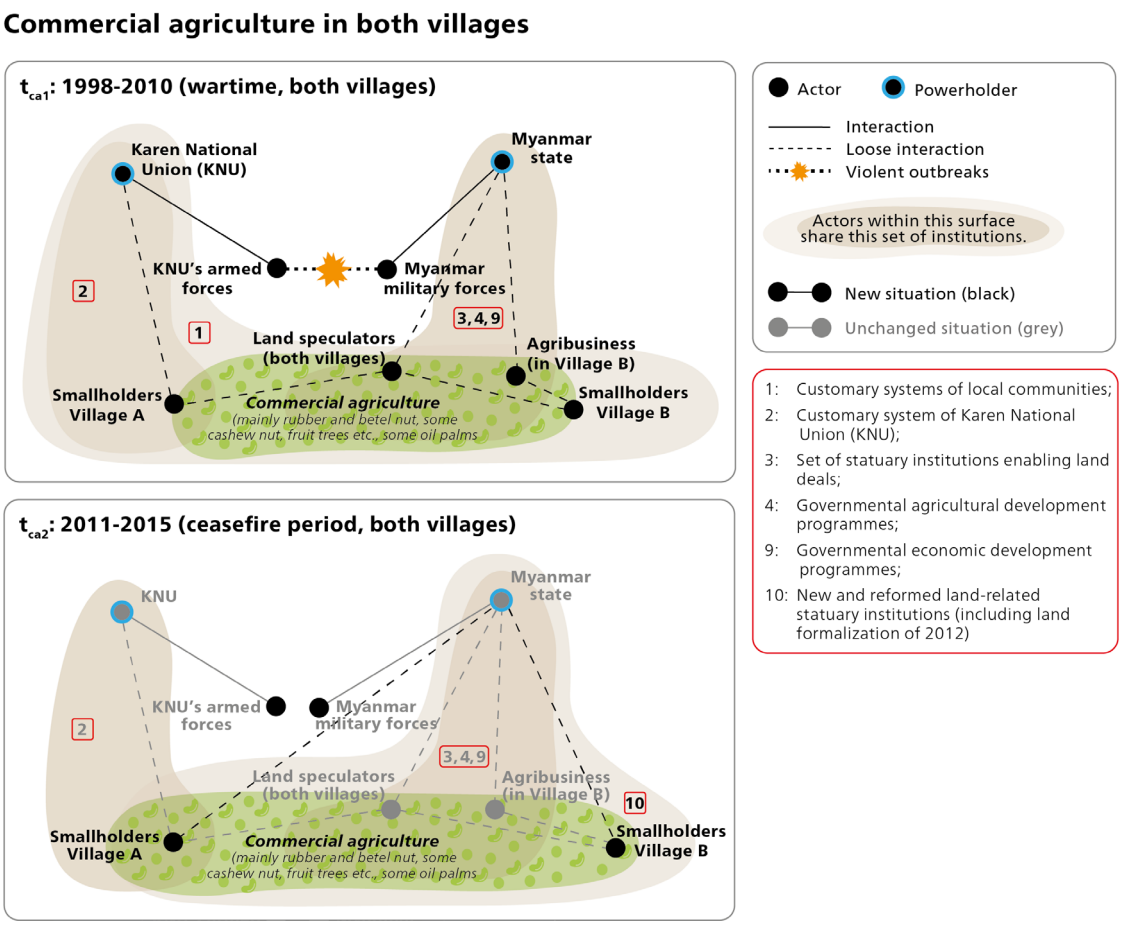

Figure 7: Land use decision-making for private sector commercial agriculture in both villages (see also Appendix C.2. for more details on institutions)

Moving forward in time, following the regional ceasefire in 2012 (t_{ca2}, Figure 7), additional land speculators and the majority of smallholders (including the *initial land users*) became LUC *implementers*, in particular, in response to two conditions: First, the end of armed fighting enabled market access for the sale of agricultural goods. Second, land reforms/formalization measures of 2012 belonging to the state's envisaged transition to peace offered land use certificates to land users who cultivated their plots permanently (therewith delegitimizing shifting cultivation as fallow land was not

eligible for land use certificates) (see shade of institution n°10 in t_{ca2}, Figure 7). Guided by their overall agenda of improving their livelihoods and supporting their children's education, smallholders' interest in holding on to their land by obtaining a land use certificate and in earning income led them to contribute substantially to local conversions to and spatial expansion of commercial agriculture. Even though the land formalization law technically only applied to Village B (Village A lies in another land zone subject to other laws), smallholders in Village A also planted permanent crops, fearing they would lose their land otherwise and hoping to earn income (to improve their livelihoods and to ensure their children's education). In this way, during the ceasefire period, smallholders in both villages became *dominant actors* in $LUDM_{ca}$ in their own right, alongside the earlier agribusiness and land speculators. Further, many smallholders interacted with the agribusiness and land speculators, the latter offering them casual work opportunities.

Overall, the Myanmar state was a *key enabler* of this extensive LUC in its position as *powerholder*. With the creation of economic and institutional incentives (institutions) for commercial agriculture, the state actively fostered the LUC and became a *dominant actor* in $LUDM_{ca,}$ both during the war and ceasefire. Following the first ceasefire agreement, the state increased its physical presence in the case study area via state department staff who administered land use certificates, taxes etc., such that the Myanmar state became better connected to the local land users (see ties in t_{ca2}, Figure 7). In $LUDM_{ca}$, we identified the state's interests as that of fostering rural development via commercial agriculture driven by domestic and foreign investors, with priority given to large-scale industrial agricultural production (Schneider et al., 2020).

Actors and institutions excluded from $LUDM_{ca}$:

The KNU was able to improve its interactions with their ethnic people in Village A during the ceasefire. However, none of our respondents stated that the KNU had a direct influence on $LUDM_{ca}$. Thus, in t_{ca2} (Figure 7), the connecting tie to the smallholders remains dotted only.

Summary $LUDM_{ca}$:

Overall, more actors were involved in $LUDM_{ca}$ compared to the initial situation, in particular because this LUC was highly incentivized by the Myanmar state such that several types of actors joined $LUDM_{ca}$, including the initial land users (smallholders). In this case, the state did not use the LUC to establish the physical presence of allies in the case study area, but rather led actors to interact and act on the state's terms while neglecting the KNU's terms. Thus, the KNU was neutralized in $LUDM_{ca}$. Through $LUDM_{ca}$, the state successfully increased its territorial control[12].

4.2. Comparison

In all three cases of LUDM, we identified a shift of the *powerholders'* engagement. While the Myanmar state increased its dominance, the KNU was gradually eliminated or neutralized in LUDM. Relatedly, the state managed to increase the physical presence of its allies and its own staff in the case study area. This leads us to assume that the Myanmar state was able to strengthen its territorial control in contrast to the KNU, who lost some of its ability to exert territorial control.

[12] The KNU still holds an important role for Karen people in the case study area, but it is not influential regarding land uses in the case study villages (at the time of data collection in 2016–2018).

However, the three cases of LUDM differ in how the Myanmar state succeeded in removing the KNU from making decisions over land uses. In $LUDM_{op}$ and $LUDM_{nr}$, the state explicitly and intentionally fostered or even requested the LUCs, directly mobilizing allies and useful institutions to implement the respective LUCs. In this way, $LUDM_{op}$ and $LUDM_{nr}$ represent top-down modes of decision-making. Moreover, in both cases we found evidence suggesting that the Myanmar state sought to weaken the KNU by altering the land uses: In $LUDM_{op}$, the state was interested in opening up the entire region to state control and pacifying the region via oil palm concessions. In $LUDM_{nr}$, the state might have applied a strategy of "green territoriality" when delineating the nature reserve (Woods, 2019). Notably, the interests of the *dominant actors* in $LUDM_{op}$ and $LUDM_{nr}$ were very diverse (detailed overview in Table B.1, Appendix B). Even the interests of the state differed depending on the land use. Overall, the state and its allies did not share the same interests when joining the LUDM, but the jointly driven LUCs enabled each of the actors to achieve their respective overall agenda, facilitating collaboration.

In $LUDM_{ca}$, the mode of decision-making was mainly guided by incentives created by the Myanmar state, allowing for a bottom-up participation of various private sector actors. In this case, the state did not need to create or rely on allies in the actor network of LUDM to implement the LUC, but rather created economic and institutional incentives to promote actions and interactions of other actors, while ignoring the KNU's institutions.

Taken together, all cases of LUDM have two results in common. First, in all cases, the Myanmar state managed to establish interactions with the immediate land users, compared to not having any connection in the initial situation. Second, for each

case, the Myanmar state succeeded in facilitating institutions, which the new land users would adhere to and which would foster a LUC.

5. Discussion

5.1. Powerholders' engagement in land use decision-making in civil war and the ceasefire period

One way for rival powerholders to gain control over land and thus territory is by influencing decision-making processes over land use, land use changes, land access, and land tenure (Bassett & Gautier, 2014; Diepart & Dupuis, 2014; Klem, 2014). In the present study, we conceive of *land use decision-making* (LUDM) as comprising all these collective processes, in which decisions over access to and use of land are made by various interacting actors across scales and sectors. In this way, we apply a governance-oriented understanding of LUDM. Based on our case study in southern Myanmar, the present article explored (1) how rival powerholders make use of actor networks and institutions to influence LUDM; and (2) the implications of rival powerholders' engagement in LUDM for their territorial control. Our analysis revealed that, firstly, the ultimate powerholder – the Myanmar state – influenced LUDM by proactively making use of actor networks and institutions from a distance. Secondly, we find that the dominance of the Myanmar state in all three cases of LUDM (relative to the KNU) resulted in increased state-based territorial control in the case study area.

More specifically, in the case of large-scale oil palm monoculture, we found that the Myanmar state intentionally mobilized allies on the ground – the military company and Myanmar's military forces – and facilitated necessary formal institutions by authorizing oil palm concessions in Tanintharyi Region from top-down. These concessions paved the way for improved state-based territorial control, because

companies constructed business-related infrastructure through which the Myanmar military – and thus the Myanmar state – in turn gained better access to the contested area. Other studies from Myanmar and elsewhere present similar findings. BadeiDha Moe civil society organization (2020) empirically investigated countless land grabs of the Myanmar military and its allies in the ethnic borderlands of Myanmar's north and east during civil war. Woods (2011) described the Myanmar state's actions in the ceasefire period as "ceasefire capitalism", according to which the Myanmar regime allocated land concessions in ceasefire zones as a deliberate post-conflict military strategy to govern land and populations in a regulated, militarized territory. Building on Woods, Thein et al. (2018) point to "crony capitalism" as a common Myanmar state practice during wartime and the ceasefire period, emphasizing that (ex-)military leaders and their family members frequently occupy important decision-making positions in powerful companies, benefit from special privileges, and control the economic sector in Myanmar. Further, studies from other countries show how construction of basic infrastructure, especially roads, can be part of an effective war or state-building strategy to access and fight an insurgent group and open up a previously isolated region to external influence (Klem, 2014). In this, we also see parallels to our Myanmar case and the processes of war- and state-making described by Castañeda et al. (2017), according to which "war-making" and "state-making", both intertwined, are described as processes in which powerholders try to eliminate or neutralize their rivals inside a certain territory.

We observe similar processes of top-down LUDM in our nature reserve case. The Myanmar state gained local allies by entering new collaboration with oil and gas companies and creating a semi-state-owned conservation organization, and provided institutions to create a nature reserve. Both institutions and the actor network increased

the Myanmar state's territorial control from a distance and eroded that of the KNU. Scholars argue that states sometimes delineate protected forests in order to weaken insurgent groups (Bassett & Gautier, 2014; Peluso & Vandergeest, 2011). We cannot determine with certainty whether the Myanmar state issued the protected-area status with the aim of weakening the KNU. Nevertheless, the nature reserve contributed to the KNU being pushed back from territorial control along some parts of the western border. In this way, the *de facto* outcome of LUDM for the nature reserve demonstrated parallels to the processes of war- and state-making, whether or not it was done intentionally by the Myanmar state. Hence, while both cases of large-scale oil palm monoculture and nature reserve can be viewed as an integral part of development projects, they also bear characteristics of state-led territorialization projects (Klem, 2014; Lestrelin, 2011), in which territorial alliances (Bassett & Gautier, 2014; Lestrelin, 2011) and institutions proved decisive.

A slightly different picture emerges from our third case, where the Myanmar state fostered private sector commercial agriculture, but in a less top down fashion. Here, the Myanmar state managed to exert control over local sites from a distance without territorial alliances to single actors but by incentivizing a variety of local actors (agribusiness, land speculators, smallholders) to collaborate with the Myanmar state. This example underlines the power of institutions, which can – even from a significant distance – serve to steer LUDM and thus LUCs. The Myanmar state pushed for land formalization in the ceasefire period, thereby defining land resources as a market good. The land formalization rush that followed enabled the state to expand the reach of its statuary institutions into Myanmar's south. This is what Sikor and Lund might call a legitimization of power and authority by regulating access to and property rights over land (2009). Meanwhile, the land formalization reforms weakened the tenure of (usually

Karen) people living on land classified as "Reserved Forest" (ineligible for smallholders' land formalization) and home to KNU adherents. Such land reforms, similar to what we observed in Myanmar during its ceasefire period, have been identified beyond Myanmar as harming the welfare of ethnic minorities (such as the Karen people in Village A) while benefitting territorialisation purposes of powerholders (Lestrelin, 2011; Peluso & Lund, 2011). One could argue that for our case, the Myanmar state's engagement in LUDM for commercial agriculture shows parallels to the processes of war- and state-making, whether intentional or not.

Taken together, in all cases the "winning" powerholder (Myanmar state) used actor networks and institutions to influence and control LUDM at local level. With the increased presence of state-friendly actors and institutions, the Myanmar state also managed to significantly increase its territorial control in the case study area. At the same time, the KNU did not seem to use – or be able to use – actor networks or institutions to shape local LUDM. Possible explanations (based on Brouwer & van Wijk, 2013) for this might be that, firstly, the KNU leadership was perceived as being mainly interested in securing individual vested economic interests of the older generation's leaders, rather than engaging at the frontlines. To our knowledge, the KNU leaders did not have any personal economic interests near the case study villages. Secondly, the KNU was said to be absorbed with internal political problems between the older, more hierarchical and change-resistant leadership generation and the younger, more moderate leadership generation. Thirdly, in the 1990s and 2000s, the KNU was often operating from the border with Thailand or from Thai territory, and the business- and military-friendly Thai president at the time preferred cooperating with the Myanmar military rather than supporting the KNU. Thailand only tolerated the KNU as long as it assumed a low profile, such that the KNU might have had difficulties winning allies.

All these reasons might have hindered or stopped the KNU from proactively engaging in local LUDM through actor networks and institutions. In this way, based on the increased territorial presence and obvious engagement of the Myanmar state in local LUDM, in contrast to the KNU's non-engagement and decreased territorial presence, we conclude that powerholders' engagement in LUDM via actor networks and institutions is decisive for their territorial control.

5.2. Limitations of the study

Notwithstanding these results, some shortcomings of the study should be noted. Results of our study were clearly strongly determined by our selection of villages. We chose villages in the mixed control area. The LUCs and the LUDM preceding them would likely look different in areas controlled by a single powerholder. For example, had we chosen a village inside the nature reserve – not on the edge of the nature reserve (Village B) – the KNU would have been the major powerholder, not the Myanmar state. The core zone of the nature reserve was and is a KNU stronghold area, in which the distant institutions of the Myanmar state exist in theory, but are largely ineffective in practice for a variety of reasons (Lundsgaard-Hansen et al., 2018; Schneider et al., 2020).

In addition, as the present research topic is politically sensitive, we experienced refusal or partial refusal to participate in the survey as well as constrained access to potential respondents, especially regarding *powerholders* and other *dominant actors* in LUDM. Further, the two powerholders were difficult to reach for surveys and interviews due to lengthy bureaucratic procedures. We tried to compensate these data limitations in the surveys by acquiring in-depth case knowledge by means of expert interviews (with third parties) and by consulting the literature (see section 3.2 and Appendix A.4. and A.5.).

Finally, we acknowledge that the actor networks and institutions under study have been simplified for the sake of comprehensibility. On the one hand, some actors were grouped together. For example, the Myanmar state was and is by no means a homogenous actor. Within the Myanmar state apparatus, the overall agenda of the top leadership can differ greatly from the overall agenda of a particular state department. By "Myanmar state", we have meant the core power entities within the state apparatus, usually the top leaders. On the other hand, by applying the spatio-temporal boundaries of the actor networks and institutions under study quite strictly, there was no room for reflection on other, possibly less obvious external influences on the main actors, such as involvement of top military personnel in the extraction of natural resources or the (il)legal border trade, as well as behind-closed-doors political and economic agreements with neighbouring states such as China.

5.3. Legacies of war- and state-making for Myanmar's future

Following civil wars, it is critical to tackle questions of land tenure, management of natural resources, and land use in order to foster a durable peace (Baird & Le Billon, 2012; Diepart & Dupuis, 2014; Unruh & Williams, 2013) and accommodate groups who were excluded from decision-making and suffered repercussions. Myanmar's national and local land use decision-making under the civilian government (2016 to early 2021) was still characterized by challenging, long-lasting legacies of civil war, including dispossessed smallholders who sought to reclaim "their" land and refugees who returned to find their villages deemed officially illegal. Moreover, similar to other (temporary) post-war societies (Unruh & Williams, 2013), Myanmar under the civilian government faced a variety of other challenges such as legal pluralism and ambiguity, unclear rights, and elite control of the economy and politics. In our study, we witnessed how the Myanmar state's formal institutions, introduced into the local context by

implementers of land use changes, gradually dominated informal institutions (i.e. customary system) and local land users. To make matters worse, the current unfolding crisis in Myanmar might bring about further changes in land use decision-making (including land use, access, tenure) from the local to the national level, initiated by rival powerholders. If and when Myanmar ideally resumes a path towards peace, it will be of utmost importance that the ceasefire and post-war powerholders recognize the relevance of prompt and fair land conflict resolutions To build a durable peace in Myanmar's centre and borderlands, current and future powerholders would need to become more determined to integrate the informal institutions of local and ethnic communities – e.g. customary systems or the KNU's land use policy – into the centralized statuary institutions. Moreover, given the likely threat of re-escalating conflict, the state's centrally-steered decision-making over land (use) would benefit from being more inclusive and respectful of ethnic minorities' interests in the borderlands as well as just and inclusive legal reform, combatting legal pluralism and ambiguity, unclear rights, elite control, and unsustainable natural resource exploitation. Addressing war legacies such as large-scale land acquisitions by military-friendly actors (S. Thein et al., 2018), but also rebel group actors, is a challenging task for any post-war powerholders. To achieve a durable peace, however, they would need to break with particular land-related war- and state-making practices associated with other (former) powerholders' regimes – and break with war legacies like land acquisitions. Under the civilian government of the past five years, this was hindered by the still-limited civilian control of the military and continued centralization of state authority (Stokke & Aung, 2020). The civilian government could not easily (or might not have desired to) revert land uses, remove allies of the military from powerful roles in land use, or change laws. It also did not

manage to accommodate ethnic groups in political decision-making to a (for them) satisfactory extent.

The current anti-military statements issued by various ethnic organizations demonstrate an unequivocal demand for a united Myanmar, in which the involvement of all ethnic groups in political decision-making is called for. If the war legacies elaborated above continue to exist in the future (during a new ceasefire and a resumed peace process), and subsequent Myanmar state authorities fail to accommodate ethnic communities and organizations such as the KNU, the prospects for durable peace will be limited.

6. Conclusions

This present article sought to illuminate how, and to what end, rival powerholders in Myanmar engaged in land use decision-making, resulting in changes of land use, access to and control over land during civil war and the ceasefire period. In a case study of a conflict-ridden borderland in Myanmar, we analysed the land use decision-making that led to three main land use changes between 1990 and 2015. We analysed how two rival powerholders – the Myanmar state and the ethnic political organization KNU – made use of actor networks and institutions to influence land use decision-making. Moreover, we investigated the implications of the powerholders' engagement in land use decision-making for their territorial control. Our analysis revealed that in all three cases, the Myanmar state strongly engaged in the decision-making, successfully increasing its control of local land use from a distance. Meanwhile, the KNU was gradually excluded from influencing land use decision-making. In two cases of territorial projects – an oil palm monoculture and a nature reserve – the Myanmar state achieved this by fostering top-down mechanisms, building actor alliances to help it control the territory, and using institutions that provided a basis for land use decision-making. The KNU was unable to

influence land use decision-making in these two cases. In the third case – that of private sector commercial agriculture – the Myanmar state did not rely on alliances, but rather created strong economic and institutional incentives that encouraged private actors to pursue land uses that benefitted the state's territorial control.

We conclude that engagement in land use decision-making can play a crucial role in influencing the outcomes of a civil war between rival powerholders, since controlling land use decision-making can imply controlling the land and territory. In our case, the Myanmar state managed to eliminate (or at least neutralize) its rival powerholder in Myanmar's south, the KNU, from land use decision-making, thereby enabling the state to exert increasing territorial control. This can be understood as a form of war- and state-making, whether the ultimate powerholder pursues such a strategy intentionally or not. That said, it remains to be explored whether such powerholders engage in land use decision-making, and therewith push for particular land use changes, as an explicit means of war- and state-making. In the case of Myanmar, the current unfolding crisis (and likely re-outbreak of civil war) could, quite sadly, shed additional light on the explicit use of land use changes for war-making and/or state-making. Using actor networks (including an actor-agency model) as a conceptual tool in combination with spatial data could be helpful to systematically investigate such knowledge gaps.

Our findings show that land system science can provide useful insights into the role of land use decision-making and land use changes in civil wars and ceasefire periods. In particular, to (re-)build durable peace, post-war powerholders must address questions of land use, access, and tenure. To tackle such questions, post-war powerholders must first disentangle and understand the legacies of (civil) war and reforms made in the immediate aftermath of conflict. Only then can they effectively

negotiate and (re-)build durable peace. For this, it is important to understand what actors were involved in or excluded from land use decision-making, their interests and alliances, and the effects of institutions on land use decision-making and land use changes during war and its aftermath. So far, this field still remains largely under-researched in land system science, despite its high relevance. We thus encourage land system scientists and others to engage in such research and related science–policy interaction, on behalf of lasting peace.

With regard to the case of Myanmar in particular, we quite sadly expect that the rival powerholders will again engage in land use decision-making and foster certain land use changes in order to increase their territorial control. If the unfolding crisis cannot be halted, we at least recommend that scientists and practitioners strive to monitor and document all upcoming major (and possibly minor) changes of land use, access, and tenure. Unfortunately, Myanmar's civilian government (2016 to early 2021) did not have much documentation of land use, access, and tenure changes of the wartime and ceasefire period accessible (e.g. land grabs, abandonment, deforestation). As a result, land conflict resolution – a central element for durable peace – was hindered by slow and challenging attempts to gather such data first. Once peace will hopefully have returned to Myanmar, the post-crisis state authorities, ethnic organizations, civil society organizations, and other peace process supporters will ideally have immediate access to much-needed data on past, present, and future changes of land use, access, and tenure (rather than first needing to spend years gathering and documenting such data). In this way, land conflict resolutions could commence much sooner, be accomplished more rapidly, and have a much greater chance of being just, which in turn would increase the likelihood of durable peace. Further, such data could provide a valuable resource in the event that parties to war are brought before a court.

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Declaration of interest

The authors declare no conflict of interest.

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Appendix A: Data collection

A.1. Exploratory field visit and choice of villages

During a first exploratory field visit in 2016, we interviewed 42 residents in four villages on behalf of a preliminary assessment of the predominant LUCs in the case study area. We then selected two villages that fulfilled the following criteria:

- accessible (incl. governmental research permits) for the project staff;
- Bamar and Karen ethnicity (one village each);
- LUCs occurring in the war period and post-war period;
- different LUCs in either village (not identical).

We opted to use letters to refer to the two selected villages (A and B) in order to avoid exposing them to potential political or other repercussions.

A.2. Survey structure

The survey had the following structure:

(4) General information about the actor: name; contact details; type of organization
(5) Main activities of the actor
(6) Strategy of the actor: goal; development priorities; ecosystem service priorities
(7) Resources of the actor: natural, human, physical, financial, and knowledge
(8) Interactions with other actors: exchanges of goods, financial capital, human capital, or information; sharing of institutions; regular events

A.3. Criteria of relevance

The boundaries of the networks under study were not predefined. In a snowball sampling procedure, we applied relevance criteria in order to identify the pertinent network. We collected data exclusively regarding ties of interaction that could be linked to a main LUC, had a direct or indirect impact on LUC, and were identified by focus group and survey respondents as relevant to their own direct/indirect involvement in (or exclusion from) respective LUDM. Similarly, we investigated only those institutions exhibiting links to, and impacts on, a main LUC.

Table A.1: Criteria of relevance for network data collection and network boundary

Element	**Criteria of relevance**
Land use change (LUC)	The LUC must be "major and relevant" from the perspective of local residents. - "major": Spatial or temporal extent of the LUC. A major LUC must either encompass a relatively large surface (also possible as a considerable sum of small surfaces) or cover a relatively long time span of (re)occurrence. - "relevant": Intensity of consequences (positive or negative) of this LUC for the local population and environment.
Interactions and institutions	When conducting the survey using the snowball sampling technique, we only followed the path to the next actor when the following criteria were fulfilled: - The respective interaction or institution was linked to a participatorily defined major/relevant LUC in at least one of the case study villages. - The respective interaction or institution had direct or indirect impacts on the LUC and therefore had relevant impacts on the local population and environment (from their perspective). - Interaction: If one of the linked actors (surprisingly) rated a given interaction as particularly influential in a survey or workshop, the researchers/interviewers were obliged to have a close look at it and decide whether the criteria described above were met.

A.4. Dealing with limited data availability

As the research topic was/is sensitive, the researchers encountered refusal to participate and inaccessibility of potential respondents – especially among the main actors. Further,

given time and resource constraints, international actors not physically present/represented in Myanmar could not be reached. To fill this gap, extensive literature research was done (references used are indicated in the main text and Appendix A) and interviews were carried out with knowledgeable third parties (all anonymous; conducted 2016–2018 by the first author and a Myanmar-based research assistant; see Table B.3). Relevant actors for which there was a lack of primary data or willingness/ability to respond in person – necessitating use of secondary data – were the following:

- An initial military-proximate oil palm company in $LUDM_{op}$: This company no longer existed at the time of data collection. Retrospective expert interviews were conducted instead. Literature was not available. However, the military company that took over the concession was available for data collection.
- International oil and gas companies in $LUDM_{nr}$: No responses were received despite repeated requests. Expert interviews were used instead as well as literature.
- KNU: Promising contact was established with the KNU regarding the research permit. However, initially no response was received regarding responding to the survey; afterwards, the KNU contact person was unavailable due to a car accident. Instead, expert interviews were used as well as literature.
- Myanmar state authorities during wartime and the transition to peace: Attempts were made to survey one specific contact person from Tanintharyi Region, but the individual ultimately declined to participate. We did not try to contact other representatives due to their general inaccessibility to the public and due to the sensitivity of the topic (to ensure the safety of local staff). Instead, expert interviews were conducted and literature was consulted.

- Myanmar military forces: We did not try to contact any representatives due to their general inaccessibility to the public and due to the sensitivity of the topic (to ensure the safety of local staff). Expert interviews were conducted and literature was consulted.

A.5. Overview of surveys and interviews

Tables A.2 and A.3 give an overview of all surveys and interviews conducted. Note that sometimes during the surveys, exploratory-qualitative discussions emerged, which were also serving as data sources, but were not registered separately. They are included in the survey database.

In order to avoid exposing them to possible political repercussions or other consequences, the respondents remain anonymous.

Table A.2: Overview of surveys during in-depth fieldwork (2017-2018)

Year	n	Completion	Mode	Administrative level and sector of respondents
2017-2018	56	Complete	All face-to-face	36 local: 24 villagers*, 7 business**, 2 community organizations, 3 other; 2 township: 2 government; 19 regional: 11 business, 7 government, 1 other; 5 national: 3 business, 2 CSO/NGO; 4 international: 1 business, 3 CSO/NGO; 2 border area: 2 business
	12	Partially complete	All face-to-face	
	6	Refusals or no response		1 local: 1 villager; 5 international: 5 business
	4	Willing but unavailable		1 township: 1 KNU 2 regional: 2 CSO/NGO; 1 international: 1 CSO/NGO

* Villagers were mostly farmers, casual labourers, and village authorities. ** Business representatives (all levels) were mostly traders, companies, investors and business or trade associations.

Table A.3: Overview of interviews from exploratory fieldwork (2016) and in-depth fieldwork (2017-2018) for data triangulation and filling data gaps

Year	n	Completion	Mode	Administrative level and sector of respondents
2016	46	Complete	All face-to-face	42 local: 38 villagers, 4 business; 4 regional: 4 business
2017-2018	45	Complete	38 face-to-face; 7 over phone	13 local: 12 villagers, 1 business; 4 township: 4 government; 6 regional: 6 business; 4 national: 2 CSO/NGO, 1 academia, 1 business; 4 international: 4 CSO/NGO; 19 border area: 19 business; 1 other: 1 business
	6	Partially complete	6 face-to-face	
	3	Refusals		2 regional; 2 government; 1 township: 1 government

Appendix B: Inputs to land use decision-making

B.1. Actors, their overall agenda and interest in land use

Table B.4: Overview of actors' inclusion in land use decision-making (LUDM), their overall agenda, and their interest(s) in the respective land use(s) (is = initial situation; op = oil palm; nr = nature reserve; ca = commercial agriculture)

Actor	Inclusion in LUDM				Overall agenda	Interest(s) in land use(s)
	is	op	nr	ca		
Karen National Union (KNU)	✓				A democratic, federal Union of Myanmar that guarantees the equality of all citizens and provides Karen people with self-determination; a Karen state with a just and fair territory and self-determination	**is:** Self-determination and equality of the Karen people and others regarding land use and tenure
Myanmar state (military-led)		✓	✓	✓	Building a united, disciplined, multi-ethnic nation, with the military as the main actor for building this union	**op:** Independence from palm oil imports; open up the government non-controlled area with plantations, to generate development and help pacify the region **nr:** Forest protection; income generation; possibly also "green territoriality" **ca:** Livelihood improvement of local population, peaceful communities under the rule of law, agricultural productivity increase
Smallholders (both villages)	✓			✓	Surviving civil war (wartime), improving livelihoods and providing education to their children (transition to peace)	**is:** Have enough food **ca:** Prove land tenure and generate income
Military company		✓			Guaranteeing the welfare of current and retired military servants and their families; creating job opportunities for local people; supporting regional development	**op:** Produce palm oil for soap manufacturing serving military camps in Myanmar
Myanmar military forces		✓	✓		"Four cuts" strategy of cutting off the KNU from food, funds, information, and local recruits from the populace	**op:** No specific interest identified **nr:** No specific interest identified
Oil and gas companies			✓		Satisfying the energy needs of customers and doing profitable business	**nr:** Corporate social and environmental responsibility programme in accordance with the Myanmar state's requests; in return for exploring, producing and transporting natural gas for Thailand (greater share) and Myanmar

Conservation organization			✓		Conserving biodiversity and protecting endangered species in collaboration with local communities	**nr:** Conserve this biodiversity hotspot with a lot of endangered and endemic flora and fauna; human disturbance is a major issue
Agribusiness				✓	Ensuring a prosperous future to children (of owner), contributing to regional development	**ca:** Generate income
Land speculators (urban elites)				✓	Improving livelihoods and providing education for children	**ca:** Generate income in the present and future, secure land titles

B.2. Details on institutions

Figures 4 to 7 visualise the institutions in place for the different cases of land use decision-making. The following list provides more details for these institutions (numbers are identical to those in Figures 4 to 7):

1. Customary systems of local communities;
2. Customary system of KNU;
3. Set of statuary institutions enabling land deals, such as Land Acquisition Act 1894, Wasteland Instructions 1991, Forest Act 1902, Forest Law 1992 and Forest Policy 1995;
4. Governmental agricultural development programmes: Self-Sufficiency Plan of the 1990s and 2000–2030 Master Plan for the Agriculture Sector;
5. Concession agreement, after 2011 land leasing contract for 30 years for military company;
6. Set of statuary institutions for investment in natural gas;
7. Set of statuary institutions for protecting forests and wildlife, such as Forest Act 1902, Forest Law 1992, Forest Policy 1995, Protection of Wildlife and Protected Areas Law 1994;
8. Corporate social and environmental responsibility agreement between Myanmar state and oil and gas companies;

9. Governmental economic development programmes: Dawei Special Economic Zone (SEZ) development plan of 2008 and rubber boosting policies of 2006;
10. New and reformed land-related statuary institutions such as the Farmland Law 2012 and the Vacant, Fallow and Virgin Land Management Law 2012 (including land formalization)

Paper IV: Sustainable development under competing claims on land

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SPECIAL ISSUE ARTICLE

Sustainable Development Under Competing Claims on Land: Three Pathways Between Land-Use Changes, Ecosystem Services and Human Well-Being

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Abstract

Competition over land is at the core of many sustainable development challenges in Myanmar: villagers, companies, governments, ethnic minority groups, civil society organisations and non-governmental organisations from local to the international level claim access to and decision-making power over the use of land. Therefore, this article investigates the actor interactions influencing land-use changes and their impacts on the supply of ecosystem services and human well-being. We utilise a transdisciplinary mixed-methods approach and the analytical lens of the social-ecological systems framework. Results reveal that the links between land-use changes, ecosystem services and human well-being are multifaceted; For example ecosystem services can decline, while human well-being increases. We explain this finding through three different pathways to impact (changes in the resource systems, the governance systems or the broader social, economic and political context). We conclude with implications of these results for future sustainable land governance.

Keywords Claims on land · Sustainability · Ecosystem services · Human well-being · Myanmar

Résumé

La lutte pour la terre est au centre de plusieurs défis de développement durable au Myanmar : les villageois, les compagnies, le gouvernement, les groupes ethniques minoritaires, les organisations de la société civile et non-gouvernementales – du niveau locale au niveau internationale – réclament l'accès à la terre, et le pouvoir de prendre des décisions sur son utilisation. Cette étude enquête les interactions parmi

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les acteurs qui influencent les changements d'utilisation de la terre, et leur impact sur le bien-être humain et la provision de services d'écosystème. On utilise une approche transdisciplinaire aux méthodes mixtes, et le cadre analytique des systèmes socio-écologiques. Les résultats montrent que les liens entre les changements dans l'utilisation des terres, les services d'écosystème, et le bien-être humain sont polyvalents. Par exemple, les services d'écosystème peuvent baisser et le bien-être humain monter. Nous expliquons cela a travers de trois différentes voies d'impact (changements dans les systèmes des ressources, les systèmes de gouvernance, ou le contexte sociale, économique et politique plus large). On conclut avec les implications de ces résultats pour la future gouvernance durable des terres.

Introduction

In 2015, the same year that the Myanmar people elected a new civilian government after nearly 60 years of military dictatorship, Myanmar representatives also endorsed the global UN 2030 Agenda for Sustainable Development. The 2030 Agenda constitutes a development vision negotiated by the global community, which is aligned around '5 Ps' (people, planet, prosperity, peace and partnership) and 17 sustainable development goals (SDGs) embracing social, environmental and economic dimensions (United Nations 2015). In 2018, sustainability goals and strategies were further specified by the Myanmar government in the Sustainable Development Plan (GoM 2018). However, implementation of these sustainability visions is not an easy task because there are not only synergies but also fundamental trade-offs between different goals such as conservation of biodiversity (SDG 15) and food security (SDG 2). Different actors usually have quite distinct visions of how these trade-offs should be resolved (Zaehringer et al. 2019).

As the use of land is key for many of these goals, competing claims on land are at the core of many related development disputes (Sachs 2018; Smith 2018; Zaehringer et al. 2019). Villagers, companies, governments, ethnic minority groups, civil society organisations (CSOs) and non-governmental organisations (NGOs) from local to international level compete for access to and decision-making power over the use of land based on different arguments such as livelihoods security, place of belonging, economic assets, habitat for flora and fauna and territorial sovereignty (Franco et al. 2015; Li 2014; Meyfroidt et al. 2018). The fundamental changes in land use and governance occurring in recent years in Myanmar can be seen as the materialisation of the power relationships among the actors involved. Resulting land-use changes include deforestation, establishment of large commercial monoculture plantations (oil palm, rubber, maize), special economic zones and increasing presence of NGOs concerned with the conservation of Myanmar's forests, which belong to the global hot spots of biodiversity (De Alban et al. 2019; Mark 2016; Scurrah et al. 2015; Tarkapaw et al. 2016; Woods 2015).

Hence, whether Myanmar can successfully advance towards the 2030 Agenda will strongly depend on how the multiple and competing claims on land are governed in the future.

The overall goal of this article is to investigate the links between recent land-use changes and sustainable development outcomes to identify leverage points and priority areas of concern for a more sustainable land governance in Myanmar. In particular, we aim to investigate how actor interactions shape land-use changes and how these changes impact on the supply of ecosystem services and human well-being. Investigation of the transformation from forest and shifting cultivation to protected areas and oil palm and rubber/mixed-crop plantations in Northern Tanintharyi highlights three pathways to impact shaped by the varying involvement of characteristics of the resource systems, the governance systems and the broader social, economic and political context.

Myanmar under Competing Claims on Land and Development Visions

During the military regime, the Myanmar government followed different socialist, communist and capitalist development visions in succession. It established a highly centralised, regulated and authoritarian state to govern the land. Instruments included agricultural master plans such as the Self-Sufficiency Plans of the 1990s. Granting of large-scale land concessions to protected companies ('cronies') was an important means to boost economic development (Fujita and Okamoto 2006; Gum Ja Htung 2014; Thein et al. 2018; Woods 2011, 2015). Moreover, land concessions were also granted for protected areas to conserve precious forests. However, as many of these government-initiated agricultural and conservation concessions were implemented in ethnic minority areas, they might also have served to extend control over these territories (Gum Ja Htung 2014; Woods 2011, 2019).

The transition to a semi-civilian government after 2011 brought a new focus on peacebuilding and economic development according to liberal principles. This changed development vision resulted in various law and policy reforms, including reformulation of the Farmland Law and the Vacant, Fallow and Virgin Land Management Law in 2012 that introduced land-use rights to attract domestic and international investments in land. As a consequence, a further wave of large-scale land acquisitions for oil palm, rubber and other commercial crops began (Fairhead et al. 2012; Woods 2015).

The land development vision of the former military regime was often in conflict with the interests and visions of ethnic minority groups and local communities. As shown by Franco et al. (2015), local communities—besides economic progress—often stress the importance of personal and community well-being based on subsistence agriculture, maintenance of identities as farmers and connections to ancestors and spirits. Under the military regime, many small-holder farmers lost access to their lands cultivated under customary land-use systems due to the land acquisitions implemented as a consequence of the military's development strategies.

Many of these developments also continued after the transition to the civilian government under the National League for Democracy (NLD) that was elected 2015 (Thein et al. 2018).

Current debates on development in Myanmar are shaped by three competing perspectives of what land-related development visions should be (Franco et al. 2015):

first, the perspective that prioritises capital-intensive large-scale monoculture agriculture and industry projects based on (neo-)liberal values (Woods 2015); second, the view that labour-intensive and small-scale traditional farming, grazing and forestry practices should be recognised, protected and promoted (LIOH 2015); and third, the perspective that calls for protection and conservation of the rich natural environment including forests, waters and biodiversity (FFI 2019).

The Myanmar Sustainable Development Plan (GoM 2018) tries to address all three perspectives, and unlike previous strategies, it considers collaboration between public entities, the private sector and the civil society as crucial. It includes a section entitled 'Improve land governance and sustainable management of resource-based industries ensuring our natural resources dividend benefits all our people'. In this section, historical mismanagement and opacity of land management are explicitly recognised and considered as widespread causes of Myanmar's underdevelopment and degradation of ecosystems such as forests and mountain areas. The plan also expresses the objective to implement 'a more effective and transparent management regime, which must include continued engagement with affected communities' and seeks to strengthen 'rural households' land tenure, property rights and related enforcement capacities'. However, the overall orientation of the Myanmar Sustainable Development Plan heavily focusses on rapid growth, economic stability and private sector integration. Effective governance and sustainable management of natural resources are introduced primarily as essential means to sustain economic growth—people's well-being is only mentioned later.

Land Systems, Ecosystem Services and Human Well-Being

Land system science is at the forefront of research aiming to generate much-needed knowledge that can help to find land-related pathways towards sustainable development (Zaehringer et al. 2019). Land system science considers land as a social-ecological system encompassing dynamics and activities related to the human use, as well as its drivers and consequences (Reenberg 2009; Turner et al. 2007; Verburg et al. 2013). To analyse the consequences for sustainable development, land system scientists operationalise sustainability from a perspective of inter- and intra-generational justice and stress the importance of integrating various actor perspectives (in particular of local communities) (Zaehringer et al. 2019). From this perspective, sustainable development of land systems requires that people living today and in the future can lead a good life, while protecting the environment.

The concepts of ecosystem services (ES) and human well-being support this operationalisation. The concept of ES captures the benefits people receive from the environment (Costanza et al. 1997; Daily 1997), including provisioning (e.g. crops and wild plants), regulating and maintenance (e.g. microclimate) and cultural services (e.g. educational values) (Haines-Young and Potschin 2018). Land-use change is often regarded as the main driver for changing ES supply. Human well-being is a multidimensional concept, and various approaches have been suggested for its conceptualisation and analysis. In recent years, a shift occurred from focussing on human well-being in terms of basic needs to a broader conception of well-being in

terms of capabilities (Alkire 2002; Robeyns 2005). Accordingly, human well-being can be defined as the freedom people have to live a life they value (Abunge et al. 2013).

To capture the link between land-use changes, ES and human well-being, the 'cascade-model' proposed by Haines-Young and Potschin (2010) has become very popular. It conceptualises the link between these elements as a chain of causality from biophysical structures and processes, functions, services, benefits and values. While the model has been substantially adapted in recent years, e.g. by differentiating the causal relations and involving various feedback loops (e.g. Daw et al. 2016), it still strongly assumes a sequential causal relation between the elements mentioned. However, there is increasing evidence indicating that these links between land-use changes, ES and human well-being are more complex and multifaceted (Horcea-Milcu et al. 2016) and that ES cannot simply be equated with people's claims on land. Consequently, land system scientists have increasingly called for more nuanced understandings and for highlighting questions of land governance (Verburg et al. 2015; Zaehringer et al. 2019). Land governance relates to the norms and rules of interaction between different actors involved in land use and the resulting power relationships (Biermann et al. 2009; Graham et al. 2003; Rist et al. 2007). It encompasses land tenure, access to land, land-use decision-making, customary practices and formal and informal policies and laws. The analysis of the actors' agency is seen as particularly important as it can yield insights into who has the power to shape the future of land use (Eakin et al. 2014; Lundsgaard-Hansen et al. 2018; Westley et al. 2013).

However, although land system scientists have started to stress the need for better integration of actors' perspectives, agency and governance questions into research on land systems, there are hardly any frameworks that provide guidance for this endeavour. Indeed, studies investigating the above-mentioned aspects usually focus on individual components of the land system; for example research on land-use changes often fails to consider the actors' agency and power relationships, and studies on land governance generally neglect questions about the ecological potential that certain land uses have to provide ES. This finding also applies to land research in Myanmar. Most studies focus on individual components of the land systems such as oil palm concessions (Nomura et al. 2019), rubber sustainability (Kenney-Lazar et al. 2018), agricultural expansion (Woods 2015), ocean and land grabbing (Barbesgaard 2019), land cover shifts (De Alban et al. 2019), deforestation (Lim et al. 2017), ecosystem services (Feurer et al. 2019), human well-being (Nydegger 2018), land-use decision-making (Lundsgaard-Hansen et al. 2018) and land-use reforms (Mark 2016), but there are very few studies that link these elements.

In this article, we argue that an integrative perspective is needed to better understand how land-use changes and sustainability outcomes in terms of ES and human well-being are linked. This requires systematic integration of knowledge on land-use system dynamics and actors' agency.

To tackle this knowledge gap, we adopt the social-ecological systems framework (SESF) (Ostrom 2009). The SESF is a template for diagnosing sustainability challenges by investigating explanatory relationships between resource and governance systems linked through focal action situations. The framework has been designed

to build generalisable statements for theory and policy, while recognising contextual differences between cases (McGinnis and Ostrom 2014). The SESF is one of the most widely adopted approaches to study social-ecological systems. It has been applied to understand social and ecological performance in specific land uses such as forestry and pasture land, but to date it has not been systematically applied to study land-use changes (Partelow 2018). We consider the SESF as a suitable framework for our study as it allows us to combine the systems perspective popular in land system sciences with an actor perspective highlighting actors' agencies and governance. This further enables the integration of insights from various disciplines (Marshall 2015).

To investigate the links between land-use changes, ES and human well-being, we ask two main research questions:

(a) How do actor interactions shape land-use changes?
(b) What is the role of these land-use changes for ES supply and human well-being?

Method

Conceptual Framework

As stated above, to address our research questions, we adopted the SESF introduced by Elinor Ostrom and colleagues (Ostrom 2009). At the heart of the SESF are the focal action situations in which actors make decisions and interact with each other and the concerned governance and resource systems. The governance systems define and set rules for the actors, which interact in the action situations. The resource systems involve resource units, which give inputs to the interactions. Sustainability outcomes are regarded as the result of these actor interactions. The focal action situations are embedded in the broader social, economic and political context and related ecosystems (McGinnis and Ostrom 2014; Partelow 2016).

Figure 1 shows how we operationalised the SESF for the study of sustainability outcomes related to land-use changes: Land uses such as forestry, shifting cultivation or commercial plantations are our focal resource systems. The land-use changes represent changes in the resource systems over time. The sustainability outcomes of concern in this study are ES and human well-being. These are seen as characteristics of the resource units and the actors, respectively. ES categories were identified through adapting the Common International Classification of Ecosystem Services (Haines-Young and Potschin 2018) and involve subsistence crops, commercial crops, livestock, wild plants, fuelwood, water flow, biodiversity, microclimate, educational values and cultural identity. Human well-being was understood from the perspective of Nussbaum's capability approach (Nussbaum 2011), covering the dimensions of life expectancy, bodily health, bodily integrity (e.g. free movement, security), senses, imagination and thought (e.g. education), emotions (e.g. family relations), practical reason (e.g. liberty of conscience), affiliation (e.g. non-discrimination, free speech), other species, play and control over one's environment (e.g. property rights, participation in decision-making).

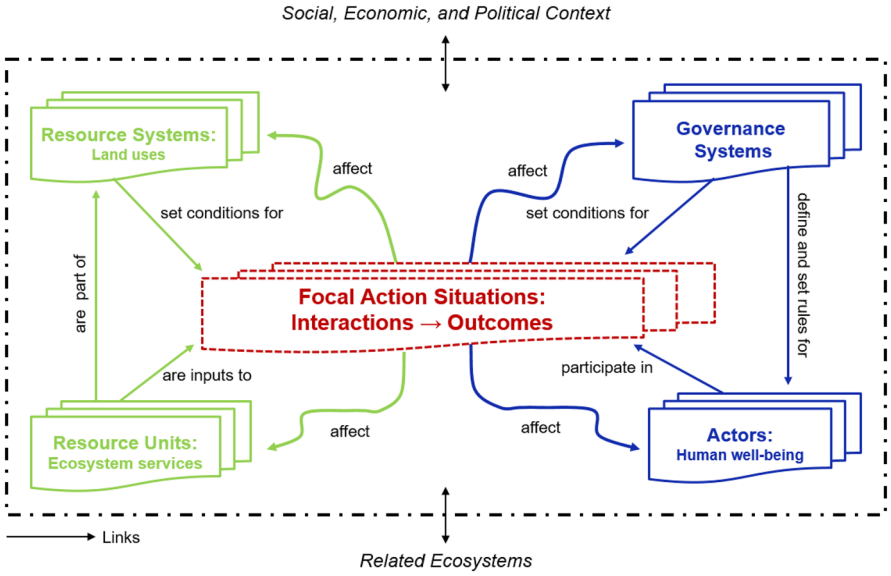

Fig. 1 Revised social-ecological systems framework adapted for the analysis of land-use changes (adapted from McGinnis and Ostrom 2014)

The links between land-use changes and sustainability outcomes in terms of ecosystem services and human well-being are mediated by the actor interactions taking place in the focal action situations. These, in turn, are shaped by the resource and governance systems and the broader context. To consider the temporal dynamics of land-use changes, we trace the actor interactions and their outcomes over the whole time period of the observed changes. By doing so, we distinguish two key phases of different context conditions: the time of the military government and the time after the transition to the new (semi-)civilian government starting in 2011/12 (Cole et al. 2019).[1]

Case Study Region

The research was conducted in northern Tanintharyi Region, southern Myanmar, in villages located in the surroundings of Tanintharyi Nature Reserve (TNR), the planned Dawei special economic zone (SEZ), the Yadana and Yetagun gas pipelines and the oil palm concessions (Fig. 2). The region was selected as it is a site where multiple actors from local to international level compete for access to land (villagers, companies, governments, ethnic minority groups, CSOs and NGOs).

Both the Myanmar government and the Karen National Union (KNU), the main local ethnic political group, claim sovereignty over parts of these areas and were

[1] As we use the framework for the synthesis of a transdisciplinary project, we use the first tier components, but not the second and third tier components defined by the SESF.

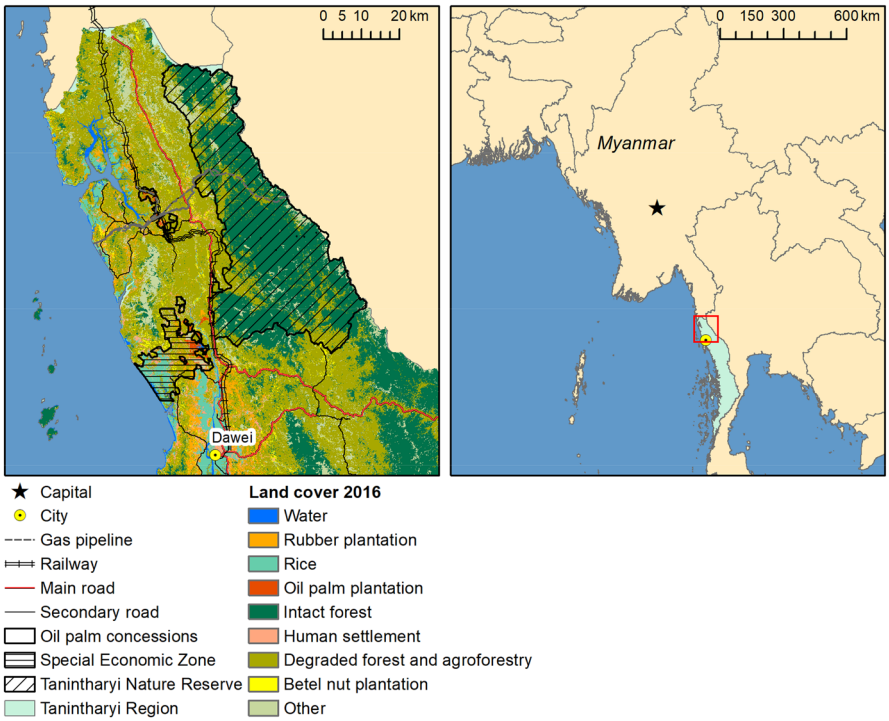

Fig. 2 Overview of study area, northern Tanintharyi Region, Myanmar. Data sources: (Schmid 2018)

involved in armed conflicts until the recent past. Many villages are located in the so-called mixed control area, and almost all villagers were in some way (involuntarily) involved in the civil war. Active fighting was most intense in the 1990s and early 2000s and came to an end with the cease-fire agreement of 2012.

Villagers are mostly farmers, but some also operate smaller businesses. They belong to the Bama, Karen or Mon ethnic groups. Due to the long-lasting civil war and the poor infrastructure, the region became quite isolated and without easy access to markets. Consequently, many villagers migrated to Thailand, although the region also experienced considerable influx of landless immigrants from other regions of Myanmar. At the time of writing, foreigners still need a special permit to visit the villages.

The specific social-ecological system constellation might be unique, considering the great diversity of Myanmar, but the multi-level multi-actor situation is also widespread in many other regions of Myanmar.

Methods

This research is the result of a synthesis effort of the project Managing Telecoupled Landscapes. The project investigated sustainable landscape management from

a transdisciplinary perspective (Pohl and Hirsch Hadorn 2007); i.e. researchers from natural and social sciences worked together with societal actors involved in the issue to jointly co-produce new knowledge relevant for more sustainable development. The overall project began with a 1-year inception phase, where we established the Switzerland–Myanmar partnership and jointly framed the key features of the study. It was followed by a 3-year empirical research phase, during which researchers from different disciplines (geography, biology, environmental sciences, economics, agriculture and forestry management) implemented their methods and finally engaged in synthesis activities. The research team involved three senior researchers, two post-docs, three graduate students and four research assistants. The Myanmar senior researcher led the overall project implementation. The Swiss senior researchers and post-docs supervised the different empirical studies and the synthesis endeavour. The post-docs, students and assistants (four of them from Myanmar) designed and implemented the studies. The fieldwork was conducted in tandem by Swiss and Myanmar researchers who worked together closely. Swiss students were partly located in Myanmar (from 3 months to 3 years).

The original research that we synthesised for this article was based on a mixed-methods approach and involved interviews, surveys, focus group discussions, participatory mapping and document review conducted in a series of joint field missions. A first 2-week field mission served to select suitable case study villages, to start collaboration with villagers and to gain an initial understanding of the local situation. In this mission, we also identified the most important land-use changes from the perspectives of the villagers, which were the basis of the following research.

The later missions lasting between 1 week and 3 months were dedicated to the following research themes: land-use changes, ecosystem services, human well-being, actors and agency. Land-use changes were further investigated through a combination of high-resolution satellite imagery with participatory mapping workshops and extensive field walks with villagers knowledgeable about the past changes (Zaehringer et al. 2020). Changes in regard to ES and human well-being were analysed through 16 focus groups and 27 expert interviews on ES supply (Feurer et al. 2019), and 6 focus groups and 52 standardised interviews for human well-being (Nydegger 2018). In both cases, the assessment included elements the local villagers considered as important, how they rated the current status/development of these elements and what has influenced change over time. Issues of actor interactions, including governance arrangements, were addressed by all these methods, but in addition, specialised focus groups (9 in total), interviews with local villagers, companies, CSOs, NGOs and government representatives (92 in total) and a literature review (grey literature, policies, reports) were conducted (Lundsgaard-Hansen et al. 2018). More details on the methods used for data collection and analysis can be found in the research publications mentioned above.

To integrate the empirical knowledge generated by the different study teams, we used a dialogue method approach. Dialogue methods help structure group conversation processes that aim to 'jointly create meaning and shared understanding about real-world problems by bringing together knowledge from relevant disciplines' (McDonald et al. 2009, p. 5). They highlight conversation criteria such as active listening, equal participation and mutual probing of assumptions (Franco 2006;

McDonald et al. 2009). Furthermore, the empirical research products were used to substantiate the insights generated.

Hence, a key part of the actual synthesis was elaborated in a 4-day workshop by all researchers involved in the project (except two assistants). First, the researchers presented their key findings using predefined guiding questions related to the SESF components. Second, the three most dominant land-use changes (in terms of area and impact perceived by villagers) were selected based on the results of participatory mapping and focus group discussions and explored in depth. Sub-groups of researchers discussed how the actor interactions and other factors of the resource and governance systems affected the land-use changes, which actors could enforce their claims on land, what outcomes were observed and how they related to each other. The insights were visualised on flip-charts through causal loop diagrams and written down in short texts. The diagrams were then presented to and refined by the whole group. By doing so, knowledge of different participants could be collected and integrated.

After the workshop, the first author further prepared the insights generated according to the SESF and systematically reviewed all existing project outputs (including informal field reports) regarding additional insights that might have been overlooked during the workshop. This analysis was based on procedures of qualitative content analysis (Flick 2005). For each land-use change, she scrutinised the workshop documents and project publications regarding information specifying the SESF key components and their interrelations. To answer the first research question (How do actor interactions shape land-use changes?), she systematised the documented actor interactions, including the actors involved, their claims on land as well as the relevant elements of the governance and resource systems. To answer the second research question (What is the role of these land-use changes for ES supply and human well-being?), she compared the findings from the ES and well-being studies that report on the SESF outcome components resource units and actors. Based on this overview, she identified the key pathways to impact and the roles land-use changes play for ES and well-being. The findings were verified by the whole research team through several feedback rounds.

Results

This section is structured using the two research questions. Insights from the literature review are cited; all other information is based on our own empirical work.

How Actors' Interactions Shape Land-Use Changes

In the following, we investigate the action situations related to the three most important land-use changes in terms of impact and spatial extension: (1) implementation of the protected public forest TNR, (2) conversion to oil palm and (3) conversion to rubber and mixed-crop plantations.

Implementation of the Protected Public Forest TNR

Implementation of the protected public forest TNR was a contested project, mainly shaped by actor interactions involving the government's forest department, oil and gas companies, the military and the KNU—all campaigning with different claims on land. Villagers and NGOs became involved only in the later stages.

In 1996, the forest department officially recognised the TNR to conserve a recognised biodiversity hotspot based on the 1992 Forest Law and the 1995 Forest Policy, but they could not formally establish it until security and financial concerns were settled. At the time, the wider area was largely controlled by an ethnic political organisation, the KNU, which claimed sovereignty over the area and disapproved the establishment of the TNR. Forest department staff could only start to implement the protected area once the military gained control and created a 'safe' environment in the conflict area.

However, it is most likely that the military's activities were not primarily aimed at biodiversity conservation, but at control of the land in the region for economic activities and territorial sovereignty (Barbesgaard 2019; Woods 2019). In particular, they protected oil and gas companies (Total, PTT-EP, Petronas), which started to take up business in the region in the 1990s to explore and extract off-shore natural gas for export to Thailand.

Oil and gas company activity was also critical for solving the financial issues. To compensate the Myanmar government for the construction of pipelines crossing the biodiversity-rich forests (right of passage) and to tackle reputational risks—the companies have been accused of collusion in human rights abuse—they agreed to finance the TNR through a public–private partnership based on a voluntary contract (Pollard et al. 2014). According to our interviews, villagers were not involved in the decision to establish the TNR. They were only informed later in the course of the TNR implementation.

The government transition and the cease-fire agreement of 2011/12 influenced the TNR-related focal action situation in two ways. First, the improved security situation allowed the forest department to further implement the TNR rules at the western park boundaries, thereby strengthening the claim for conserving biodiversity. For patrolling the deeper forest, however, the TNR rangers need to coordinate their patrols with the KNU as a matter of respecting the cease-fire agreements, because at the present time, the KNU still holds sole control over large parts of the TNR area including several Karen villages that lie within the protected area. Having their own perspectives on sustainable land management (2015 Land Use Policy), the KNU does not accept the TNR rules defined by the Myanmar government and continues to allow the use of the area for subsistence and commercial crop production. Second, community rights, already formally established in the 1995 Forest Policy, became more widely known and implemented. In 2013, an international NGO aiming to empower local people for community-based sustainable forest management started to support the villagers in applying for community forestry certificates. These certificates allow for communal uses for 30 years, and since a law revision in 2016, also for minor commercial uses.

Conversion to Oil Palm Plantations

The conversion from forest, shifting cultivation and perennial plantations of cashew and other crops to oil palm monoculture was mainly driven by the former military government's self-sufficiency policy and palm oil companies' business interests (crony companies and smaller regional companies). It was highly disapproved by other actors such as local villagers and the KNU. Further actors such as the regional government, CSOs and foreign aid providers became relevant in recent years.

The self-sufficiency plan was intended to reduce the country's dependency on imported products and to satisfy the increasing demand of the domestic population for cheap edible oil (Woods 2015). To implement this plan, the government granted oil palm concessions to crony companies. Our research shows that, in most cases, villagers were not involved in the oil palm development and had resentments against the companies. Being extraordinarily poor and heavily affected by still ongoing military oppression, villagers often did not dare to oppose the companies because they were afraid of their relationship with the military. The KNU also strongly disagreed with the oil palm expansion, but they could not stop the development either due to the military's superior power. In some other cases, smaller regional companies or entrepreneurs applied for small- to medium-scale land-use permits to establish an oil palm business of their own accord. In these cases, the companies and local villagers usually respected each other's activities.

The government transition of 2011 brought one new development to the oil-palm-related action situation. In 2016, the Regional Chief Minister created multi-stakeholder platforms (MSP) that aimed to review the oil palm concessions and to redistribute uncultivated land. The MSP is facilitated by the foreign aid and central government supported OneMap project. The MSP has—for the first time since the outbreak of civil war many decades ago—brought actors from different societal factions to one table: government representatives of various departments, palm oil companies, CSOs, village representatives and the KNU. While concessions have been revoked in a few cases, the multi-stakeholder process is highly challenging due to the multiple claims of the actors involved and currently seems to be blocked. This might also be an indication that the former power relationships still largely persist (for more information see Bächtold et al. in this special issue).

Conversion to Rubber and Mixed-Crop Plantations

The Myanmar government also played an important role in the conversion to rubber monoculture and mixed-crop plantations (mainly cashew and betel nut but also other crops such as lime or cacao), but in contrast to the other two land-use changes, villagers and smaller regional companies and entrepreneurs from nearby towns also played a key role in and welcomed the conversion.

Once the most severe phases of the civil war with food insecurity, lack of transport and market access, as well as widespread violence had subsided, local communities started to complement their subsistence-oriented farming activities with commercial activities to increase their income and satisfy their livelihoods. But it was only in around 2005/2006 when the Myanmar government pushed the rubber market

in the context of their 2000–2030 Master Plan for the Agriculture Sector and abolished the government quotas that increasing numbers of villagers and entrepreneurs from nearby towns engaged in the business—until then, 45% of private harvest was reserved for the government (Woods 2015). Entrepreneurs were attracted due to the great promise of the crop (it was perceived as 'white gold', even though it did not turn out as such later) and the easy access to land. Unlike oil palm, rubber was not regulated through concessions but through different mostly customary land rights and the KNU land policy. Entrepreneurs generally accepted these rights and policies. Some villagers acted as land brokers and unofficially organised the land deals. As a consequence, within only a few years, land turned into a pricey and scarce resource.

The government transition of 2011 fostered a veritable production boom, through which shifting cultivation was mostly abandoned (at least in the government-controlled areas). This was for two reasons: first, the decrease in armed conflicts enabled the villagers to regain mobility as they could access their plots and the market places again due to better security; second, the legal reforms replacing the customary-dominated land tenure system with formal land certificates created a legal land market (Kenney-Lazar et al. 2018; Woods 2015). Land users can obtain land use certificates (e.g. Form 7) if they can prove that they cultivate crops on their land. This encouraged many villagers to convert shifting cultivation systems into permanently cultivated cropland. Moreover, it is likely that entrepreneurs from nearby towns were motivated by rubber not only as a valuable commodity, but also as a land-claiming strategy in the context of land speculation against the background of the announced Dawei special economic zone strongly promoted by the governments of Myanmar and neighbouring countries. Indeed, only a few rubber plantations are professionally managed and none of the actors interviewed had succeeded in producing good-quality rubber or achieved a satisfactory income from rubber.

The Role of Land-Use Changes for ES and Human Well-Being

ES Supply and Use

The analysis of local actors' perspectives showed that, compared with the 1990s, when the landscape in northern Tanintharyi was dominated by forest and shifting cultivation, today, the supply of many ES have declined while a few have increased (mainly commercial crops such as rubber, cashew, betel nut and lime). The general decline in the supply of regulating ES such as biodiversity, water flow and regulation of microclimate, as well as a decline in the provisioning of wild plants, fuelwoods and livestock can be explained by an overall loss of intact forest landscapes. Hence, it is directly attributable to the changing resource systems. But in other cases, new rules and regulations have narrowed villagers' access to and use of ES in the remaining forests and also in company-owned oil palm plantations. Thus, the decline in ES supply is not only the consequence of the changing resource systems, but of the changing governance systems too.

The three land-use changes played different roles for ES supply and use. In the case of the TNR implementation, many regulating ES could be maintained through protecting the forest and vulnerable ecosystems. Forest cover is clearly higher within the TNR than outside, but satellite images also show various signs of logging and crop production activities inside the protected area, pointing to the fact that deforestation could not be stopped completely (Pollard et al. 2014). Provisioning ES related to subsistence use are also often still available, but due to the TNR regulations, they cannot be readily accessed any more by the local communities along the western boundary—with the exception of some community forest areas.

ES trade-offs caused by land-use changes are most pronounced for the conversion of forests to oil palm plantations, as their chemical-intensive management has particularly negative consequences for many regulating ES, such as water flow and biodiversity. Additionally, access to provisioning ES from oil palm plantations, such as firewood and livestock, are socially differentiated. While many villagers do not have access to them due to company regulations, company-related actors such as (mostly migrant) plantation workers do. The only ES that increased is commercial crop production for the companies. But, ironically, despite Tanintharyi Region being the most suitable region for oil palm cultivation within Myanmar, the climate and environmental conditions are not appropriate enough for effective oil palm production and yield. Thus, palm oil companies cannot compete with those in Malaysia and Indonesia. Consequently, the established oil palm plantations are not very profitable and the actually planted areas are often much smaller than the granted concessions.

The conversion from forest to rubber and mixed-crop plantations decreased the overall supply of ES, but it substantially increased the provisioning services of commercial and subsistence crop production. The cultural services also shifted. Having strong connections with nature, local communities attribute many cultural ES to forest ecosystems. But also shifting cultivation is deeply embedded in their culture, and more recently, they started to assign cultural values to rubber and mixed-crop plantations (e.g. betel nut) as they allow them to generate income and acquire a different way of life. Consequently, considering the conversion of forests/shifting cultivation into rubber or mixed-crop plantations, trade-offs between different ES seem almost balanced in the perspectives of local communities. Villagers can obtain more income from commercial crops as a solid and diversified subsistence base (except for rice). Nevertheless, while interviewees generally accepted a slight decrease in biodiversity, climate regulation and cultural services, limited water supply, which is affecting agricultural production and human well-being most directly, was considered at risk if forests in important water catchment areas are cut down.

Human Well-Being

According to the perspective of the villagers, the human well-being situation has generally improved since the land-use conversions started in the 1990s—but not necessarily to satisfactory levels and not for all people. Elements that improved included, in particular, life expectancy, bodily health including nutrition, bodily integrity including housing and security, options for education, free speech and living together as a family, as well as the capability to control their environment

through access to land and income opportunities. However, many people still live under adverse conditions and struggle with basic livelihood issues. They also deplored lost access to land, water and forest resources.

The changes in human well-being can partly be explained through the changes in the land-use-related resource systems and ES. For example, deforestation reduced the water flows, which negatively affected crop production and drinking-water quality, which again negatively affected well-being related to human health and nutrition.

In many other cases, however, human well-being dimensions were improved or worsened through changes in the land-use-related governance systems (e.g. new use regulations) or the broader social, economic and political context. In particular, interviewees often highlighted the significance of the ending of the civil war. During the war, where the military and the KNU were fighting for sovereignty over the region to implement their claims on land, people heavily suffered and were deprived of many basic capabilities needed to lead a good life. They regularly had to hide in the forest, plantations were destroyed, public services such as clinics and schools were scarce, and free movement was impossible due to fighting, movement control, lack of infrastructure such as roads and few motorbikes and cars. Human rights violations were also reported. It was particularly challenging for the Karen villages, which suffered heavily from the military's counter-insurgency activities. Hence, once the immediate violence threatening people's lives and bodily integrity stopped, they could take up again basic activities such as accessing and cultivating their fields, visiting relatives and friends and the construction of infrastructure, such as roads, transport and electricity.

Investigation of how well-being was affected by the three land-use changes revealed diverse outcomes. The TNR implementation affected, in particular, villagers at the western park boundaries, as they were officially prohibited to use various forest-based ES. While villagers benefiting from commercial crops could compensate this loss more easily, people not owning land were affected more strongly. When the community forestry rights became more widely known and implemented through the help of an NGO and the TNR management itself, the situation started to improve again (but the community forestry products are still not ready to be harvested).

Conversion to oil palm plantations heavily affected the well-being of the people using these lands. While most concessions of crony companies were granted on land that official records classified as so called 'waste land' or reserved forest land, i.e. land that is officially not used for agricultural activities, interviews revealed that these lands were in fact often claimed by villagers for subsistence and commercial crop production, grazing or collection of wild plants or firewood. Hence, as a consequence of the oil palm concessions, villagers lost their lands and thereby their capability to achieve various land-based well-being dimensions such as nutrition, participation in the community life and control over their environment. Moreover, human rights violations have been reported.

Conversion to rubber and mixed-crop plantations, which were co-driven by the local communities' struggle to generate income opportunities, led to an overall increase in human well-being, despite an overall decrease in ES. While most ES decreased, commercial crop production increased and thereby the villagers' financial

resources. As a consequence, people could substitute benefits they formerly received from the environment with other products. For example, while forest products such as fuelwood, timber, wild food and medicine became scarcer, people started to use concrete and metal to build their houses, and they were able to buy medicine and food on the market. This might also be the reason why we could not observe extensive negative effects from giving up subsistence rice production: villagers usually obtain enough money from the sale of their commercial crops and have a secured access to markets to buy rice.

Moreover, the increasing rush on land due to all three land-use changes has intensified land scarcity. Consequently, there is a widespread fear among villagers of losing their land or not being able to extend their agricultural fields for new family members due to the general land-rights insecurity. As work and income opportunities of local communities are still strongly based on agricultural activities, not owning land is a major challenge and affects many well-being dimensions.

Discussion and Conclusion

Our research aims to explore the link between recent land-use changes and sustainable development in Myanmar through an interdisciplinary synthesis effort. In particular, we investigated how actors' interactions shaped land-use changes and the role of these land-use changes in ES supply and human well-being in northern Tanintharyi. The generated results contribute to ongoing wider developments of middle-range theories in land system science (Meyfroidt et al. 2018), as well as to identify pathways for more sustainable development in Myanmar.

Contributions to Middle-Range Theories Linking Land-Use Changes, ES and Human Well-Being

Adopting the SESF as an analytic lens to study how land-use changes translate into ES and human well-being, we found that, until the 1990s, the action situations around land in northern Tanintharyi were shaped by local villagers and their ethnic organisations, who claimed the forested land for subsistence use and maintenance of their livelihoods and identities, mostly in shifting cultivation systems. Since then, increasing numbers of other actors from regional to international level have entered the action situations (different entities of the central and regional government, companies, NGOs and CSOs), leading to three main land-use changes: (1) implementation of the protected public forest TNR, (2) conversion to oil palm, and (3) conversion to rubber and mixed-crop plantations. Shifting cultivation for subsistence rice production has been widely abandoned, and larger areas of intact forest can only be found in the TNR and along the border with Thailand. These results confirm findings of other recent land-use-change studies in Myanmar (De Alban et al. 2019; Lim et al. 2017; Woods 2015).

The land-use changes investigated were driven by different actor constellations. Their claims on land were shaped by heterogeneous commercial, conservation and political interests. Depending on the actors' agencies and prevailing power relations, some actors were more successful than others in implementing their claims. While local communities played an active role in the conversion to rubber and mixed-crop plantations, decisions on the two other changes—implementation of the protected area TNR and conversion to oil palm plantations—were mainly taken by powerful actors at places and scales beyond the local systems (in particular, national and international companies and the former military government), making it difficult for villagers to realise their own development aspirations.

But consequences for ES and their link to human well-being are complex and multifaceted. While the three land-use changes resulted in a decline of many ES, in particular regulating services such as biodiversity and water flow, overall, human well-being improved for many people—though not for all.

Hence, our empirical research challenges models that relate land-use changes, ES and human well-being in a linear way, in particular, the widespread belief that deforestation will lead to a decline in the well-being of people due to a decline in ES supply (Raudsepp-Hearne et al. 2010). In contrast, we found that multiple ways exist to explain the relation between land-use changes, ES and human well-being.

Referring to the SESF, they can be divided into three different pathways to impact. The interactions between specific actors are key in all of them, but depending on the action situation, the characteristics of the resource systems, the governance systems or the broader social, economic and political context are decisive for their outcomes. For example, deforestation leading to a decrease in ES supply of wild plants and livestock, which in turn decreases human well-being of dependent villagers, can be understood as a change in the resource system leading to a change in the resource units (ES) involved, which in turn negatively effects the well-being of certain actors.

However, whether this change effectively translates into negative well-being impacts depends on the agency of the actors involved and the ruling governance system. In general, we observed that positive well-being effects were more likely in cases where villagers could co-drive the land-use change and thereby enforce their own claims on land. For example, deforestation for mixed-crop plantations often decreased overall ES supply but increased commercial crops. As a consequence, villagers having use rights for these lands can substitute benefits they formerly received from the forest with other products. This decoupling of ES and human well-being is a trend that has often been observed in countries of the Global North (Horcea-Milcu et al. 2016), but also seems to be relevant for countries of the Global South (Urech et al. 2015). People tend to adjust valuations of some services over time. Valuations of ES are changing with the peoples' changing needs, expectations and interactions with nature. Thus, future research on the link between land-use changes, ES and human well-being must reflect on a more constructivist and less positivist logic (Raudsepp-Hearne et al. 2010; Urech et al. 2015).

Moreover, in many cases, it is not the land-use changes and related ES that influence human well-being, but the broader socio-political processes involved in the land-use competition. Indeed, the termination of the active fighting between

the Myanmar military and the KNU and the activities of the oil and gas companies might be the main reasons for the increased well-being of the local communities. The peace agreement ended more than six decades of civil war that undermined human well-being, and it created favourable conditions for local communities to engage in agriculture or other economic development. The complex ways armed conflicts can influence land-use changes and human well-being have also been raised by Baumann and Kuemmerle (2016), but despite the significance of the topic, it represents an underexplored topic in land system science.

Implications for Sustainable Development

Since the government transition starting in 2011/12, several windows of opportunities emerged in northern Tanintharyi Region, in particular allowing people to re-engage in economic and political activities, lead a life in peace and furthermore increase their well-being. However, current social, economic and political developments dominated by market liberalisation and the opaque power situations in place including the unclear role of the military today, also raise questions regarding future sustainable development. It currently seems that economic claims on land and interests of national and international investors are clearly valued more highly than local villagers' interests and customary rights on land (Franco et al. 2015; KHRG 2018; Mark 2016). This is reflected in the recent 2018 revision of the controversial Vacant, Fallow and Virgin Land Management Law, where the opportunity to strengthen community land rights was overlooked in favour of an strengthened process of market liberalisation (41 INGOs and CSOs 2018), and in the stagnating palm oil concession redistribution process (Bächtold et al. same special issue).

Moreover, considering the projected continued deforestation rates and the related decline in ES, it is unclear whether and to what level human well-being can continue to improve in the future, in particular as regulating services such as water flows and biodiversity are much less likely to be substituted (Raudsepp-Hearne et al. 2010). This is relevant in particular because land is becoming increasingly scarce.

Fostering land-use management that is favourable for the well-being of local communities and maintenance of ES in the long term—a precondition for implementing the 2030 Agenda as well as the Myanmar Sustainable Development Plan—is a truly challenging task. Our findings related to the three pathways to impact point to four priority areas of concern:

- Considering the key role the armed conflict between the Myanmar government and the KNU played in land-use changes, sustained peace might be the single most important factor enabling local communities to enhance human well-being. Moreover, to protect ES in the whole region—inside and outside of the TNR—enhanced peace dialogues between the Myanmar government and the KNU must include land-use issues. But sustained peace in itself might not stop ongoing deforestation processes.
- Therefore, strong land-governance arrangements need to be negotiated, simultaneously strengthening ES proliferation and human well-being. These can include

measures that foster ES and human well-being in the same areas, e.g. community forestry or sustainable mixed-crop plantations, but might also include measures that fully protect intact forests in certain areas, while fostering profitable commercial crop production in others, e.g. professionalisation of rubber production. Moreover, to reduce livelihood dependency on land, the creation of alternative, not-land related or exploiting income opportunities must be developed.
- But today, peoples' livelihoods still strongly depend on land, so securing local communities' access to land is key. Land insecurity also increases the risk of deforestation (Robinson et al. 2014). However, land titling is no panacea. It might also cement existing or produce new inequalities, rendering the villagers even more vulnerable, because—in times of crisis—they might sell their land for short-term money, having less land afterwards (Dwyer 2015).
- However, negotiation and implementation of more promising land-governance arrangements also require broader transformations, namely regarding government accountability and know-how, hidden power relationships between dominant actors from businesses, government and other powerful actors such as the military, as well as widespread societal phenomena related to established fear, mistrust and prejudices towards other actors and ethnic groups.

In short, taking into account the three pathways to impact between land-use changes, ES and human well-being, we argue that future research should deepen the understanding of actors' agencies and power relationships related to land-use changes, including the role of the armed conflict (Woods 2019). Moreover, more emphasis should be placed on what practices and leverage points might effectively foster fundamental transformations of the current social-ecological systems towards more sustainable development.

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Compliance with Ethical Standards

Conflict of Interest All authors declare that they have no competing interests.

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Paper V: Assembling drones, activists and oil palms

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SPECIAL ISSUE ARTICLE

Assembling Drones, Activists and Oil Palms: Implications of a Multi-stakeholder Land Platform for State Formation in Myanmar

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Abstract

Amid Myanmar's political transition and despite its new government's discourse of inclusion and dialogue, land conflicts have increased across the country's ethnic-minority areas. We argue that land plays a central role in the complex interplay of state formation, armed conflict and international development in Myanmar's contested borderlands and that land conflicts can provide an entry point to make sense of these dynamics. We use ethnographic data and a framework combining Deleuze and Guattari's concept of assemblages with Foucault's conception of power to provide a detailed analysis of a multi-stakeholder platform (MSP) addressing land disputes in Myanmar's south-east. Analysing the platform's discourses, practices and technologies, we argue that, despite its emphasis on inclusion, participation and dialogue, it is the operation of power that upholds this inherently conflictive assemblage. The platform opens spaces for agency for less-influential actors, but it equally produces de-politicising and exclusive effects. While scholars have typically used assemblage thinking to analyse how state authority is disassembled by the growing role of non-state actors, we aim to further post-structural reflections on state formation and international development by arguing that the central state in Myanmar actually expands its reach into the borderlands through assemblages such as the MSP. This happens at the expense of the authority of quasi-state formations of ethnic armed organisations. Thus, this process is reminiscent of how the Burmese state expanded its reach through assemblages of land and resource extraction during the 'ceasefire capitalism' before the transition.

Keywords Myanmar · Burma · Development · State-building · Land · Assemblage · Multi-stakeholder platform

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Résumé
Alors que le Myanmar est en pleine transition politique, et malgré le discours d'inclusion et dialogue du nouvel gouvernement, les conflits autour de la terre ont augmenté dans les zones des minorités ethniques du pays. Dans cet article, nous soutenions que la terre joue un rôle central dans le cadre complexe des interactions surgies de la formation de l'état, du conflit armé, et du développement international, dans les zones près des frontières contestés du pays ; et que les conflits fonciers peuvent nous fournir un point d'accès à la compréhension de ces dynamiques. On utilise des données ethnographiques et un cadre théorétique - combinant le concept d'agencement de Deleuze et Guttari avec la conception de pouvoir chez Foucault - pour analyser en détail une plateforme multipartite qui règle les disputes foncières dans le sud-est du Myanmar. On analyse les discours, les pratiques et les technologies de cette plateforme, et on plaide que – malgré son accent sur l'inclusivité, la participation et le dialogue - c'est l'opération du pouvoir qui stabilise cet agencement intrinsèquement conflictuel. La plateforme ouvre des espaces d'action aux acteurs moins influents, mais également elle produit des effets exclusivistes et dépolitisants. Typiquement, les chercheurs ont utilisé le concept d'agencement pour analyser comment l'autorité de l'état est déterritorialisée par le rôle croissant d'acteurs non-étatiques. Ici, notre but est de contribuer aux réflexions post-structurelles sur la formation des états et le développement international, soutenant que l'état central en Myanmar étend sa portée dans les terres frontalières à travers d'agencements tels que la plateforme multipartite. Cela arrive au détriment de l'autorité des formations quasi-étatiques, qui sont les organisations armées ethniques. Ce processus évoque comment l'état Birman a pu étendre sa portée, à travers l'agencement de terres et l'extraction de ressources, pendant la période du 'capitalisme cessez-le-feu' avant la transition.

Introduction

Amid Myanmar's transition to democracy and peace that was announced by the quasi-civilian government in 2011, land conflicts have increased. This is particularly the case in Myanmar's ethnic-minority areas (Mark 2016b) and seems at odds with the new emphasis on inclusion and dialogue that has dominated the government's discourse since the beginning of the transition. Land conflicts seem a constant across a range of diverging situations in Myanmar's borderlands: in the country's south-east, where a peace process pacified armed conflict; in the north-east, where fighting continues (e.g. Keenan 2016); and in western Rakhine State, where the international criminal court is currently investigating accusations of genocide (Bowcott 2019; Prasse-Freeman 2017). How can we analytically make sense of the apparent constant of land conflicts and their role in this complex interplay of state formation, armed conflict and international development in Myanmar's contested borderlands?

In this article, we use the empirical ethnographic analysis of a multi-stakeholder platform (MSP) addressing land conflicts in the country's south-east as an entry point. We critically dissect its discourses, practices and technologies to show how power operates within such a platform with international involvement and to reflect on the MSP's broader effects on state formation.

To do so, we follow the post-structural scholarship on state formation and de-centre the state as a category in our analysis (Sassen and Ong 2013) by using Deleuze and Guattari's (1980) assemblages, coupled with Foucault's (1976) conception of power as de-centred and dispersed. Rather than as a unitary entity, we think of the state as the effect (Mitchell 1999; Painter 2006) of assemblages of various actors (military, foreign investors, international NGOs, local governments, militias etc.) who are involved in how government happens in an area (Sassen 2006; Sassen and Ong 2013). We argue that assemblages of land and resource extraction have been crucial to expand the formation of Myanmar's central state's 'reach' into people's everyday lives (Allen and Cochrane 2010) in the borderlands before *and* during the transition. What changed with the transition, however, is the increased involvement of international development in this dynamic—which is giving rise to novel assemblages such as the MSP we are analysing here.

Building on Li's (2007) framework of analysis, we focus on practices, technologies and discourses that came with international development and that have altered the way power operates in these novel assemblages of land and resources. But despite the MSP's emphasis on including more stakeholders, participation and dialogue, it realises power effects in its operation: Alignment among actors is forged and forced through the discourse of development; the use of specific technologies like drones; and specific participatory practices to uphold this inherently precarious assemblage over a certain time. In this sense, the MSP opened new spaces for resistance and agency for less-influential actors but equally produced de-politicising, exclusive effects and contributed to the expansion of the reach and authority of the formation of the state at the expense of other actors.

What emerges from our analysis is thus a cautionary tale against seeing MSPs as a 'silver bullet' for more 'inclusive' development in the contested environments of armed conflict. They constitute messy complex processes deeply entangled with the power structures of their environment and are far from constituting a 'technocratic fix' that can cut through politics (Frewer and Chan 2014). At the same time, our analysis is a caveat against understanding complex processes of state formation as something that can be 'managed' or 'built' with the pre-dominant influence of international actors.

The remainder of this manuscript is organised as follows: Against the outline of dominant conceptions of 'state-building' and their critics, we introduce our use of the concept of assemblage and methodological considerations on our own positionality as involved in the very assemblage we analyse. We then proceed with the historical context of state formation and land conflicts in Myanmar, before we analyse the empirical case of an MSP in Myanmar's south-east. We conclude with a reflection on the broader implications of this analysis.

Myanmar and 'State-Building'

Since the advent of Myanmar's transition process in 2011, optimistic tones of an opening society, democratisation and inclusive development started crowding out international actors' former focus on human rights abuses and sanctions.[1] Following international intervention frameworks for post-conflict situations such as the New Deal for engagement in fragile states (OECD 2011),[2] international non-governmental organisations (NGOs), local civil society organisations (CSOs) and bilateral donors started programming for the strengthening of 'legitimate institutions' and 'economic foundations' for peace in Myanmar. These prescriptions have also been enshrined in the plans for international engagement to support Myanmar's transition agreed with the government (Government of the Republic of the Union of Myanmar 2013).

Underpinning these efforts is the institutionalist paradigm of international state-building intervention that understands state-building primarily as the strengthening of state institutions (Lemay-Hébert 2009). If state institutions' capacities for delivering services and 'development' to its citizen can be 'improved'—as this logic goes—their legitimacy will increase and conflict will abate (Paris 2010; Rocha Menocal 2011). The most relevant question remaining, then, is that of which institutional design to 'build' (Wolff 2011). In this paradigm, the state remains largely unquestioned as a category. It is posited as an ahistorical entity that can be 'built' in a political vacuum only constrained by its geographical borders, its monopoly of the legitimate use of physical coercion (Weber 1956 [1922]) unrivalled and uncontested.

But while this prism of state-building is dominant in the development and peace-building communities' discourse (Lemay-Hébert and Mathieu 2014), a plethora of criticisms has been levelled at this conceptualisation of state formation in the academic debate. Interventions aiming to 'build states' have been criticised for their universalist pretentions of their (Western) normative underpinnings (e.g. Lemay-Hébert 2009), for falsely assuming that all states will converge towards the model of liberal democracy (Hagmann and Péclard 2011), for neglecting institutions in states' peripheries (Mampilly 2011), for their neo-imperialist (e.g. Chandler 2006) or neo-colonialist (e.g. Jabri 2013; Sabaratnam 2017) tendencies, for their disinterest in their local context (Mac Ginty & Richmond 2013), their poor geographic and strategic targeting (Bastide 2016), for their emphasis on order, stability and thus their inherent conservatism (Heathershaw 2008) or for being a manifestation of biopolitics separating a 'developed West' from the 'under-developed' Global South and East (Duffield 2007).

[1] On this point, see Bächtold (2015, 2016), and the article of Wells and Décobert in this special issue.

[2] For example the New deal (OECD 2011) or the principles for good engagement in fragile situations (OECD, 2007)

Many post-structural scholars have thus turned their attention away from institutions and towards the study of the everyday of international intervention and the hybrid orders they create (Mac Ginty and Richmond 2013), the role of expert knowledge production (Bliesemann de Guevara and Kostić 2017; Bueger and Bethke 2013; Sending 2015) and the material aspects of intervention (Mac Ginty 2017).

Our paper contributes to this post-structural line of critical analysis and particularly adopts the interest in the complex array of actors, knowledge and objects exercising authority in the context of armed conflict found in the analyses of Mac Ginty (2017), Bliesemann de Guevara and Kostić (2017) or Bueger and Bethke (2013). As proposed by Mitchell (1999) or Sassen and Ong (2013), we thus de-centre the state as a (unitary) category in our analysis. When applied to our empirical case, namely an MSP in Myanmar's south-east, this prism allows us to draw a more nuanced picture of both how authority is produced in the contested environment of Myanmar and how international development fits into the power struggles of Myanmar's transition processes.

Assemblages and the Formation of the 'State'

Two elements are crucial for the analytical task to 'de-centre' the state in our analysis: Firstly, we use Deleuze and Guattari's (1980) concept of 'assemblages': Rather than as a unitary entity, we think of the state as made of heterogeneous formations of institutions, actors, practices and material objects that reach into people's everyday lives (Allen and Cochrane 2010) and realise state effects (Mitchell 1999; Painter 2006). Secondly, we follow Li (2007) and 'lodge' the assemblage concept within Foucault's (1976, 1977b) conception of power as de-centred and dispersed.

In abstract terms, Deleuze and Guattari (1980) describe assemblages as heterogeneous and disparate elements that are convoked into a formation. Elements brought together can thus include institutions, actors and practices but also material objects, which are understood as developing a certain agency through their connection with other parts of the formation. Important for our analysis is that assemblages are productive: they produce new behaviours and actors and establish new territorial organisations as they emerge (re-territorialisation) but can also transform and break up (de-territorialisation) in an ongoing dynamic (Abrahamsen and Williams 2009; Müller 2015). Drawing on Foucault (1977b), we understand these formations as imbued with power: Alignments among the elements in an assemblage have to be forged or forced, ruptures and contradictions have to be glossed over with specific practices and they realise power effects in people's everyday lives (Li 2007).

In our analysis, we think of the state not as a unitary entity producing authority but as a formation made of assemblages (Allen and Cochrane 2010) that realise (or sometimes fail to realise) state effects (Painter 2006). As Gupta (1995) reminds us, states exist because people imagine them according to their interactions with the 'state' and for which areas they imagine the state as being in charge to find solutions.

Hence, people or institutions practice or perform the state and thus make it thinkable (Ciro Martínez and Eng 2017).What comes into view are thus practices through which the formation of the 'state' is 'reaching' into (Allen and Cochrane 2010) or 'invading' local arenas (Lund 2006). This opens the possibility to analyse the role of diverse elements (private companies, expert knowledge, militias, practices, technologies etc.) and how their struggles for legitimacy form part of how government happens in a specific area; or put differently, how the formation of the state realises its effects (Mitchell 1999) via specific (ethnographically observable, concrete) practices.

So far, scholars using assemblage thinking focussed predominantly on the disassembling of the state or national territory (Sassen 2013): They used it to make sense of private actors in the provision of security (Abrahamsen and Williams 2009; Doucet 2015), of (international) land acquisitions (Sassen 2013) or, more broadly, of globalisation and the nation state (Ong and Collier 2005).

The opposite is the case for our analysis: We use assemblage thinking to understand how the legitimacy of the formation of the central state in Myanmar is reassembled to extend its reach and realise its state effects in the country's borderlands. As we will argue below in a historical overview and our empirical analysis, this process took the form of assemblages of militarised resource extraction in the past. These allowed the formation of the central state to extend its reach into the borderlands and to weaken the reach of formations of competing quasi-states, namely ethnic armed organisations' own state formations with their administrative systems. With the beginning of the transition, this process has increasingly involved assemblages of international development.

Thus, assemblages offer the possibility to analyse the role of international development in the production of authority by analysing its specific practices. The Foucauldian lens helps us to uncover the operation of power in these processes: While international development discourse relies on notions and practices of inclusion, empowerment and participation, its formations are still imbued with power and realise power effects with their broader implications (Ferguson 1990); For example seemingly apolitical (Leuenberger 2019) practices like map-making are important elements in how ministries make societies legible (Legg 2006; Mitchell 2002; Scott 1998) and hence governable (Foucault 2004). Accordingly, 'rendering technical' and thus de-politicising highly political questions is a specific way in which power operates in international development (Mosse 2004).

With the growing popularity of assemblage thinking, different uses of the term emerged. Although some authors like Sassen (2006) have described assemblages as an 'analytic tactic' (Sassen and Ong 2013) or a new frame for their inquiry (Ong and Collier 2005), others have attempted to develop assemblage thinking into a fully fledged theory (De Landa 2006).

For the purpose of this paper, as it becomes clear from our considerations above, we are more interested in the operation of power and practices that stabilise assemblages—even if only temporarily and precariously so. Hence, we found it beneficial to couch assemblage thinking in a broader theory rather than using it as a theory itself (Collier 2013; Müller 2015). In that sense, we found in Li's (2014, 2007) operationalisation of assemblages a helpful starting point, as she is leaning her use of

assemblages closely on Foucault's (1977b) conception of power (Legg 2011; Müller and Schurr 2016). We went beyond Li's (2007) practice-focussed operationalisation of assemblages, however, to more explicitly include the role of discourses. We thus analyse assemblages via three areas of observation: discourses, practices and technologies.

Its emphasis of multiplicity and of change through ruptures[3] makes assemblage thinking coupled with Foucault's conception of power particularly suited to grapple with complex shifting situations of environments of armed conflict: We think that rather than being produced by a unitary state entity, authority or 'government', in the borderlands of Myanmar, is better understood as the product of various state formations and diverse actors struggles for legitimacy. Authority is contested and dynamically made and re-made. Assemblage thinking helps making sense of how government happens and state effects are realised in the power struggles among this complex mosaic of military and non-military actors.

Methodological Considerations and Positionality

Finally, a few of the epistemological considerations regarding our own positionality are necessary. An analytic of assemblage comes with a strong ethnographic empirical interest in specific practices (Bueger 2013; Prince 2017), and how they link to discourses, power and knowledge production (Bliesemann de Guevara and Kostić 2017; Collier 2013; Li 2007). We take these considerations seriously and do not purport that we are describing these processes from afar in an objective neutral academic discussion. We—and consequentially this article—are part of the operation of power in the assemblage of the MSP we analyse: The co-authors of this article have served as chief technical advisor for the research and development institute supporting the platform and as researcher accompanying this process. The lead author was contracted as an external advisor to critically reflect on the broader implications of the platform—a process which led to this article.

It is our 'insider' perspective that enabled us to get a fine-grained understanding of the process' inner workings: Being part of the assemblage gave us access to the data collected for this article in interviews, observations and direct participation in the MSP over a period of 3 years, from 2015 to 2018. But it may also have prevented us from seeing certain things due to our positionality. Working with a Foucauldian conception of power and this framework's sensitivity for the subtle processes of exclusion, marginalisation and subjugation of less influential actors' accounts has certainly helped us to establish a critical distance. But as Foucault (1977a) reminds us, science or academic knowledge production is inseparably linked to systems of power—and thus, neither objective nor neutral. Consequentially, our whole analysis must be considered as the production of 'expert knowledge' that plays a specific privileged role in the operation of power in the assemblages that we analyse. All

[3] Especially in comparison with the similar concepts of actor-network theory (e.g. Latour 2005), which conceptualises changes fluidly, without rupture (Müller and Schurr 2016).

too often, 'expert knowledge' is used to shut down discussions and exclude other accounts (Sending 2015).

We thus invite the reader to consider our analysis critically: It is written from our positionality involved in the research and development institute supporting the implementation of the MSP and as European academic scholars in a process in Myanmar. While we tried to do justice to different perspectives, our account will necessarily be incomplete and potentially exclude others.

Hence, by no means would we understand this article as 'evidence' or even practical prescription for more effective MSPs. What we aim for with this article is to dissect and critically analyse how power operates in our empirical case, and we invite to re-think the role of international actors in such processes: Not as 'external' actors providing 'neutral expertise' but as actors that are 'lodged' within the operation of power in assemblages and whose practices realise a range of (intended and unintended, inclusive and exclusive) power effects. Thus, we see our analysis as a caveat against understanding complex processes of state formation as something that can be 'managed' or 'built' with the pre-dominant influence of (international) actors.

State Formation, Armed Conflict and Land in Myanmar: A Historical Perspective

Before delving into the analysis of our empirical case of a MSP set up to address land conflicts, we outline the militarised assemblages of land and natural resource extraction that have historically contributed to expand the reach of the formation of the (central) state into Myanmar's borderlands. As we will argue in the following sections, this dynamic has changed its form in some areas with Myanmar's transition, but certain continuities remain.

At least since the establishment of British colonial rule in 1826, the relationship between the centre and the periphery of the Burmese state has been mostly one where the former tried to control and govern the latter (Scott 2009). Since its independence in 1948, the country has seen a multitude of armed conflicts predominantly between the central government and dozens of ethnic minority groups.[4] Under its succession of military regimes, the country's military (*Tatmadaw*) has conducted violent military campaigns to expand and assert the central state's authority into the borderlands, where ethnic armed organisations formed quasi-states with their own fully fledged administrative systems (Callahan 2003, 2007; Smith 2007; South 2017). For decades, state-building in Myanmar mostly took the form of violent campaigns waged against its population (Callahan 2003).

This dynamic changed when ceasefire agreements calmed parts of the country in the 1990s. Although these agreements never addressed the ethnic minorities' demands for recognition and armed conflict continued in other areas, these

[4] For extensive accounts of Myanmar's (recent) history, see Callahan (2003), Smith (1999, 2007), South (2008) or Taylor (1987)—or the contributions of Bjarnegård or Kreutz in this special issue.

agreements brought a relative stability to some ethnic minority areas (especially Kachin State). This, in turn, allowed for large-scale exploitation of natural resources in areas that were not accessible to the central state before the ceasefires (Brenner 2015; Kiik 2016; MacLean 2010).

This new dynamic illustrates why we consider assemblage thinking particularly suited to analyse Myanmar's borderlands—and by extension, contexts of armed conflict: Rather than through direct military control, the formation of the (central Burmese) state started to expand its authority into these areas through formations of various actors which Callahan (2007) called 'emerging political complexes'. These assemblages comprise *Tatmadaw* units, ethnic armed organisations under ceasefire agreements or transformed into so-called Border Guard Forces under *Tatmadaw* control, an extraordinarily large number of local militias (Buchanan 2016), local and international businesses and foreign investments in agriculture, resource extraction and infrastructure projects (Woods 2011). Material elements in these assemblages such as bulldozers, roads constructed, deforestation or mining did not only decisively shape the landscape but also the strategic possibilities to project military force into the borderlands. What emerged were extremely complex 'mosaics' of overlapping control and authority in what Woods (2011) named 'ceasefire capitalism'.

To use the terminology of assemblages, the 'ceasefire capitalism' of the 1990s (re)assembled the formation of the central state in Myanmar's borderlands, relying on complex networks of various actors asserting different forms of (competing, overlapping) government. At the same time, ceasefire capitalism partially disassembled the formation of quasi-states that were dominant in these areas before: most prominently, the authority of the governing institutions of the Kachin Independence Organisation (KIO) in the north and later the Karen National Union (KNU) in the south-east of Myanmar. While the authority of the central Burmese state was hardly relevant before the ceasefire in areas where people had been relying on their ethnic armed organisations to govern for generations (Brenner 2019), these areas were suddenly confronted with this new authority and the 'reach' of the central state into people's everyday lives.

Land played a crucial role in this overall process in two specific ways: Firstly, as Woods (2011) argues, land concessions were not undermining state sovereignty. They were integral to expand the reach of the formation of the Burmese state's authority into the borderlands through resource extraction and agriculture investments in ceasefire capitalism. Secondly—and more closely linked to our empirical analysis—land conflicts have markedly increased after the beginning of the transition in 2011, with the government granting large concessions to a few well-connected domestic and international enterprises (Jones 2014; Mark 2016b). Accordingly, communities in affected areas are typically suspicious of any government activities related to land and fear further extraction at the expense of local farmers (Ferguson 2014). Yet in these struggles, some communities in the ethnic-minority areas were forced to engage with the central state's institutions for the very first time; And because of the government's new emphasis on dialogue and inclusivity, they were encouraged to do so. Only in the process of contesting the state's claims to land and of putting forward their own counter-claims, the central state institutions'

authority became relevant to their lives (Mark 2016b). Put differently, through these practices of contestation, the formation of the (central) state was reified (Ciro Martínez and Eng 2017) and realised state effects (Painter 2006) in a different way—with power structures altered but not suspended.

Clearly, land conflicts have much broader implications than being a mere 'side-effect' of 'development'. In this article, we thus use land conflicts—or more specifically, attempts to deal with land conflicts—as an entry point to put forward a more complex understanding of how state institutions' authority is reified and expands its reach through iterative practices of contestation over land. As we will argue in the remainder of this article, development interventions with international involvement have become an integral part of this dynamic since the beginning of Myanmar's transition.

Power, Development and Drones: The Oil Palm Concession Review in Tanintharyi

The general dynamic in Myanmar's borderlands described above also applies to Tanintharyi, the area of our empirical case study. Located at the southernmost tip of the country (bordering Thailand to the east and the Andaman Sea to the west), the area has seen armed conflict primarily between the KNU and the *Tatmadaw* over decades. In the late 1990s, the military government decided to turn the region into the 'oil bowl' of the country. Over 50 land concessions to mostly national companies were granted to plant oil palm in an area of over 1 Mio. acres. This included forests, high-conservation-value ecosystems and land that was used by local communities—some of which had been displaced by the armed conflict between the government and the KNU. Land conflicts pit local communities and CSOs against domestic and international businesses holding land concessions and against the government that grants those concessions (Buchanan et al. 2013). Adding to the mix of actors that govern, compete for authority and influence decisions reaching into people's lives are actors of international development: international NGOs, United Nations agencies, consultants, think tanks and research institutes. Accordingly, a complex 'mosaic' of various overlapping authorities can be observed (Woods 2015).

Forging and Forcing Alignment through the Discourse of Development

By 2015, the old ways in which Myanmar's centre related to its periphery had been significantly ruptured: first with the new discourse of Thein Sein's government on transition, peace and development, and then, with the election of the new National League for Democracy (NLD) government. Accordingly, the newly elected NLD state government attempted a new way of dealing with land conflicts in Tanintharyi: Recognizing the political sensitivity and the multitude of different claims at stake, the regional government initiated an MSP tasked with compiling updated data and maps for a technical assessment of the oil palm concessions. An international research and development institute and a Yangon-based NGO were requested to

provide technical and financial assistance to the process as part of their OneMap[5] project.

While several MSPs have been initiated since the beginning of the political opening of Myanmar, this one uniquely includes actors who normally do not sit at the same table: regional government, CSOs representing local communities, private oil palm companies and the KNU. Given the histories of violent conflict marking the relationships between the central state in Myanmar and its periphery, distrust is high and a dialogue process bringing together all stakeholders is unlikely.

However, three elements forged the alignment (Li 2007) of these actors and left them with little choice but to participate in the platform: Firstly, the status quo was untenable for all sides. Government lost credit for the poor management of land resources, communities lost access to the land they depend on and oil palm companies were not able to operate in a profitable manner due to disputes with communities and unpredictability of government interventions (among other reasons).

However, local civil society would not be pulled into the new assemblage without resistance: Initially, it ferociously opposed the MSP. Even before the OneMap project became active, rumours of a new project portrayed as 'doing mapping for the government' spread among civil society. This was perceived as another exercise by the central government to unilaterally decide on the use of contested land. CSOs quickly started to mobilise and campaign against the project. In response, the international research institute facilitating the process invested considerable resources in building relationships with organisations from Tanintharyi's civil society via trusted intermediaries and in confidence-building measures to convince CSOs to participate in the platform. Notwithstanding these efforts, the platform nearly fell apart in one of the first meetings because CSOs did not want to be involved in a platform in which the oil palm companies participated as well. After extended discussions, the CSOs decided to participate for the time being.

Secondly, the development discourse that has become dominant with the country's transition (Bächtold 2015) is hard to oppose. Development discourse promises to overcome the untenable status quo through a well-facilitated inclusive process and to ground solutions in 'scientific' evidence on the 'actual' situation based on cutting-edge methods and technology. At the same time, it frames the adversarial conflictive stance as 'unconstructive' or backwards. Development discourse thus depoliticises highly political problems and constitutes 'technical' solutions as the only way forward (Ferguson 1990).

The CSOs' positions have been oscillating between cautious participation and frontal opposition to the process. This is illustrative of the tension within the assemblage and shows how the power structures of development discourse hold the precarious parts of the assemblage together. In their advocacy outside the platform, the CSOs make it very explicit that they do not uncritically endorse the idea of economic development brought by large often multi-national companies and joint ventures. A report by several CSOs (Tarkapaw Youth Group et al. 2015) is entitled 'We

[5] This project promotes coordination, open data and the use of newer mapping technology among actors involved in land questions, including a range of state ministries.

used to fear bullets, now we fear bulldozers'—and makes clear that they consider growing investment and resource extraction an existential threat to the communities' livelihoods, akin to the former threat of armed conflict. But when making demands within the land platform, the CSOs stop short of radically questioning the previous and current development approach of the government. As the MSP was set up to review oil palm concessions, the dialogue circles around the 'pragmatic' less political questions of the extent of the palm oil concessions—while larger questions (e.g. on whether the concessions should exist in the first place)—are excluded. Development discourse thus serves as a vehicle vague enough to accommodate demands within the assemblage but equally de-politicises, manages and narrows them towards more technical questions.

Thirdly, 'inclusiveness' of decision-making processes on land questions is a central demand from CSOs. The existence of an MSP thus has a strong pull for CSOs to participate, but there is an equally strong fear that the multi-stakeholder dialogue is a pro forma exercise used to legitimise the process. As one activist put it: 'We have to be careful and see [whether] we can really have influence. If not, we will have to leave the process.'[6] CSOs suspect that they will not be permitted substantial influence on the actual policy decisions taken. This fear materialised later in the process, when the government took unilateral decisions on land issues without consultation within the MSP, including a decision to cancel some oil palm concessions. The suspicions voiced by stakeholders during the process—that the government will decide itself in the end and bypass the MSP—thus were partly confirmed. The consequence of these events is a considerable distrust in the platform; to the point where several stakeholders are on the brink of pulling out. This is a stark reminder that the operation of power within assemblages can gloss over certain contradictions, but that they remain inherently precarious formations.

Forging Alignment through Technology and Practices

In the new assemblage to deal with land conflicts, the way data—specifically maps—are produced and used is significantly altered. Before the platform, the practices of 'mapping' by the government and 'counter-mapping' (Peluso 1995) by CSOs had become part of the 'standard repertoire' in land conflicts in the region.[7] The struggles over whose knowledge (or map) counts are at the centre of the tensions among the different actors involved, and map making is highly political (Frewer and Chan 2014; Leuenberger 2019).

In the assemblage though, these political questions are suspended through specific practices and technologies: The OneMap project, of which the assistance to the MSP is part, explicitly aims to produce maps that are more accepted by *all* stakeholders, relying on technology, participation and dialogue.

[6] Interview with civil society activist, August 2017.

[7] Interview with an international advisor to local CSOs in Tanintharyi, May 2017

The project's self-image portrays it as providing 'expertise' and necessary technology [for example related to remote sensing, geographic information systems (GIS), drones or data management] to improve and digitise the manual methods still in use in relevant ministries. The approach taken in the platform relies on recurring meetings, technical capacity building and the production of new spatial data. Maps for the platform were produced with the help of state-of-the-art international expertise and explicitly innovative technology. The drones deployed for mapping as well as the purchase of high-resolution satellite images promised higher precision than that of previous maps developed with older techniques. The implicit claim of the maps thus produced is to be more accurate and, by extension, a more 'objective' representation of the 'real' situation (cf. Leuenberger 2019). Thus, the technology employed in this project develops an agency[8] of its own that pretends to de-politicise the process of mapping: It is because of the newer technology used that the maps produced by a satellite or drone are seen as superior to the maps produced by a human drawing by hand using landmarks as reference points.

The MSP thus presents itself as a process that allows to base decisions on evidence, reducing tensions among stakeholders because of its inclusivity and the superior quality of the data produced. At the same time, it circumvents more entrenched issues at stake among the stakeholders involved by guiding the dialogue to 'technical' solutions to problems that are mostly political in nature.

'Rendering technical' was even used as a strategy to be able to address sensitive issues in an unfavourable political context; therefore, making it a conscious practice to hold the assemblage together. Maps have been used to initiate discussion often among 'technicians' from the different organisations involved: 'As soon as a map is on the table, people start focusing and discussing'.[9] In a way, the project's approach thus reiterates the hope that a technological 'fix' will be able to cut through politics (Frewer and Chan 2014).

In the MSP, technology also develops another kind of agency that is at least of equal (if not higher) importance: The use of drones and field verification to produce maps allows for different stakeholders to do mapping in a co-productive manner. Going to field trips to the sites of land conflict together with different stakeholders and the communities involved and operating the drones with the support of international technicians makes a co-production of maps possible.

Such a co-production is a powerful means to produce maps that are difficult to dismiss by the actors who participated in their creation and is illustrative of the new relations assembled here: Instead of each side producing their own conflictive maps, actors are (physically) pulled together in workshops and field trips to produce data.

[8] In the sense of an agency of material objects as proposed for example by Latour (2005)

[9] Interview with OneMap chief technical advisor, April 2017

Inclusion and Exclusion in the Platform

The question of how inclusive this co-production was, though, is a thorny one. Representation in an MSP is always imperfect, and two issues deserve specific attention here: Firstly, CSOs and the KNU were representing the local communities and the Karen populations that were displaced by the armed conflict years ago. While this meant that the claims of these communities were regularly brought up by the CSOs and the KNU and thus strongly present in the discussion during the field trips on sites of land conflicts, the displaced communities themselves were not. How adequately the CSOs and the KNU were able to represent the voices of these communities is an open question, as there is no guarantee that this setup did not reproduce intra-communal power structures and patterns of marginalisation.

Secondly, even if people were physically present in the MSP, there were clear differentials in the level of expertise on technical land questions among the participating actors. This bears the risk that actors with more expertise, higher status or more confidence to voice their concerns were able to influence the dialogue more decisively. While the MSP tried to mitigate this risk by providing technical capacity building to stakeholders beforehand and closely facilitating the dialogue, expert discussions can still have an excluding effect on non-experts (Sending 2015). This is especially the case when technical discussions on how to produce, classify and analyse data are highly contested, as was the case in the MSP.

This illustrates that pre-existing power structures do not suddenly disappear within an MSP and may continue to produce effects of exclusion despite measures to increase inclusion.

Broader Implications of the MSP

It becomes evident from this account that assemblages such as the MSP are inherently ambiguous: On the one hand, they offer the possibility of influencing policy for actors that have little direct influence on decision-making processes typically dominated by the government, business interests or the military. On the other, this space is clearly bounded: With the government still holding the final decision-making power and the organisation facilitating the process being dependent on a working relationship with the government to be able to operate in the country, the outcomes of the process will not be too radical or too opposed to the dominant interests—insofar as these interests are able to steer the process. Thus, the pre-existing power structures are altered in their details—but also re-produced in their broad lines. In this sense, assemblages can open new spaces for resistance and agency for less influential actors, but at the same time, they equally subjugate, tame and manage other perspectives.

An effect that we call the ‘perils of inclusion’ can serve to illustrate this: A process like the MSP draws its legitimacy from being ‘inclusive’. The existence of such a platform in turn means that other more adversarial strategies of making demands on land issues can be de-legitimised as uncoordinated, unpragmatic or unwilling to compromise. If the above-cited civil society activist’s organisation eventually pulls

out of the process, it runs the risk of finding other channels of influence suddenly less effective, as they are not part of the assemblage established to deal with land issues. However, if the organisation remains in the process, it runs the risk of conferring legitimacy to an outcome that might not be acceptable in its view but which has come out of an 'inclusive' process.

Noteworthy when considering the broader implications of the MSP is that this emerging assemblage simultaneously disassembles the (conflictive) assemblage to deal with land conflicts that preceded it. The older assemblage relied on a clear separation between the formations of the (central) state and the more diffuse quasi-state of the KNU. This separation was stabilised by a certain discourse (a shared experience of suffering from the violent expansion of the centre, the demands for recognition by the ethnic minorities), practices (countermapping, adversarial advocacy or even military rebellion) and institutions (the KNU administration, its land policy) and thus established a territory under the authority of the KNU—separate from the formation of Myanmar's central state. In the new assemblage, these elements are considerably weakened with the practices analysed above.

As we argued above, the assemblage narrows the debate on land to the technical issues and excludes larger political questions—for example how the government's land policy relates to the contradicting land policy of the KNU. While the KNU's land policy vouches to respect customary land tenure systems (Karen National Union 2015), the government's land policy has created a formalised land market (Mark 2016a). Although the two policies are clearly conflictive, the topic is carefully avoided in the MSP. The existence of the MSP—and its positioning as an inclusive encompassing means to address land issues—implicitly legitimises the frameworks within which this process operates, which is the Myanmar government's land policy. For the KNU, the space offered by the MSP is thus equally bounded: Participating offers the prospect of influencing decisions that might be favourable for the Karen communities and displaced populations that have lost their land and which the KNU sees as its constituency. But this comes at the price of accepting that these solutions are created within the government's land policy and thus might set a precedent for this policy to be applied in other areas as well.

Finally, the companies participating in the oil palm concession review illustrate yet another dimension to how the space of the platform is clearly bounded. The companies holding concessions had the least choice of all stakeholders to join or remain in the process, as it is their concessions that are under scrutiny. There was thus not much choice for the companies other than to stay engaged and to negotiate an acceptable outcome to the process. At the same time, the more political question of how their concessions came into being in the first place and why these concessions have created so many conflicts with communities has been effectively excluded from the debates in the platform.

Overall, the new assemblage problematises land conflicts in an ahistorical manner: It excludes the histories of violent contestation and suffering and puts the inclusive and 'pragmatic' solutions—based on technical evidence—instead. In that sense, it disassembles the former relationships among actors, institutions and material objects that were constitutive of the previous formation and disassembles the separate (and contested) quasi-state territories that were embedded in it—along with the authority of the

KNU. What emerges is a new assemblage that territorialises the formation of the central state as unitary and which extends its reach into the borderlands.

Conclusions

In this article, we use assemblage thinking to make sense of the complex dynamics of land conflict, state formation, armed conflict and international development in Myanmar's south-east. Against the institutionalist understanding of state formation, we argue that states cannot be 'built' by improving state institutions' capacities. Instead, we propose to 'de-centre' the concept of the state and think of it in terms of assemblages that realise state effects.

With our empirical analysis of an MSP addressing land conflicts, we show how an assemblage forges and forces alignment among actors with conflicting interests by connecting development discourse (inclusive processes, evidence-based solutions), practices (capacity building, co-production of maps) and material objects (oil palms, drones, maps) in novel ways. This process equally disassembles what preceded it, namely the older assemblage that relied on contestation and a shared experience of suffering from the central state's violent expansion into ethnic-minority areas. At the same time, it breaks up the configuration of territories (quasi-states in the periphery and the central state) that the older assemblage enshrined.

Although the practices, actors and discourses have changed in comparison to former ways of the state relating to its periphery, the new assemblage also territorialises the central state's authority and reach in new expanded areas. In that sense, we argue that assemblages involving international development play a role in realising state effects similar to that played by assemblages of land and resource extraction under the 'ceasefire capitalism' of the 1990s.

While the MSP relies on notions of dialogue and inclusivity, it is imbued with power and realises its effects. The power structures that are constitutive of Myanmar and its armed conflicts are not suddenly suspended within the assemblage, and it can have de-politicising and excluding effects. The space opened within the MSP for less influential actors is thus clearly bounded.

As our analysis illustrates, MSPs are not a 'silver bullet' for more 'inclusive' development in contested environments. They constitute messy complex processes with often ambiguous or contradictory outcomes, and they are deeply entangled with the power structures of their environment.

Compliance with Ethical Standards

Conflict of Interest As stated in the article, two of the authors are staff of the international research institute involved in the multi-stakeholder process, and one author has served as an external advisor to this process.

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Paper VI: The (in)ability of a multi-stakeholder platform to address land conflicts

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The (In)Ability of a Multi-Stakeholder Platform to Address Land Conflicts—Lessons Learnt from an Oil Palm Landscape in Myanmar

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Abstract: Oil palm landscapes are often characterised by land conflicts. Multi-stakeholder platforms (MSP) may be a promising means to contribute to conflict resolution. However, the merits of MSPs are limited in contexts with strong power imbalances and entrenched conflict histories. This study analyses an MSP from Myanmar. We developed an analytical framework based on literature on MSPs and social learning and used qualitative methods such as participatory observation and interviews. The study investigates how the MSP was designed and governed and whether it was effective in addressing the land conflicts around oil palm concessions. The study discusses several promising factors of the MSP for being effective, such as adequate inclusion of stakeholders, secured resources, or effective facilitation. However, the analysis also reveals how hindering factors such as lack of a clear mandate, goal, and decision-making competences of the MSP, insufficient communication, or lack of legal and land governance expertise contributed to only limited effectiveness of the MSP. Further, we discuss whether the MSP was a suitable approach in the given context of nontransparent land governance mechanisms, persisting power disparities, and longstanding conflict history. We conclude that designing and governing an MSP in such a context needs to be done very cautiously—if at all—and recommend paying special attention to ten specific points.

Keywords: Myanmar; Burma; oil palm; land conflict; concession; multi-stakeholder platform; social learning

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1. Introduction

Despite offering economic and social benefits for various groups of stakeholders, palm oil is also known to be connected to political violence, land dispossession, and other diverse forms of negative social, economic, or environmental impacts in the countries of origin of palm oil [1–4]. Oil palm landscapes are also known to be part of war- and state-making strategies of totalitarian governments. In Indonesia, for example, the expansion of oil palm plantations from the 1960s until today has been linked to (re-)territorialisation processes toward achieving centralisation of the state [5,6]. In Myanmar, the military-led state used the handing over of oil palm concessions to companies during the 1990s and 2000s to gain physical access for its troops to a remote rebel-controlled area, which strengthened the military's territorial control [7]. The expansion of oil palm landscapes is also known to be part of a resource, wealth, and power accumulation strategy of the domestic elite, for example in Guatemala, Indonesia, and Myanmar [3,8–10]. Many examples of top-down oil palm expansion as part of war- and state-making, as well as elite-driven accumulation strategies alike, have resulted in land dispossession, food insecurity, and the social and economic marginalisation of segments of the local population [3,6,8,10,11]. These disadvantaged groups are usually indigenous people, ethnic minorities, or smallholders, more

generally. Inevitably, oil palm expansions in such contexts lead to conflicts over land tenure, land access, and land use (in short: land conflicts), which tend to remain unsolved as a result of highly unequal power distribution between local populations, totalitarian governments, and/or plantation companies [8–13]. Such land conflicts can severely undermine the prospects of peace, and consequently, sustainable development.

Particularly following deeply rooted, historical conflicts such as armed, ethnic, or political conflicts, it is critical to tackle questions of land tenure, access to, and use of land in order to foster durable peace [7,14–16]. Windows of opportunity for addressing historical and contemporary land conflicts in oil palm landscapes can occur at various points. In Indonesia, for example, the transnational voluntary standard called the Roundtable on Sustainable Palm Oil was brought to the country by several national NGOs, who joined this international membership organisation as part of their strategy to resolve land conflicts resulting from continued palm oil expansion [17]. In Myanmar, several ceasefire agreements between the government and some armed groups in the 2010s after a long civil war and the election of a civilian government have led to a government-led multi-stakeholder process addressing historical and contemporary land conflicts related to oil palm concessions [18].

Multi-stakeholder platforms (MSPs) are perceived as being a promising means to contribute to solutions for land- and natural resource-related conflicts [19–22]. Literature often refers to the definition of MSPs authored by Steins and Edwards, in which they define a platform as "a negotiating and/or decision-making body (voluntary or statutory), comprising different stakeholders who perceive the same resource management problem, realise their interdependence in solving it, and come together to agree on action strategies for solving the problem" [23] (p. 244). The Roundtable on Sustainable Palm Oil and the High-Level Multi-Stakeholder Platform on the Implementation of the Sustainable Development Goals are two examples of important, high-level MSPs. MSPs, however, can also exist at a much smaller scale or level, such as in a village, where representatives of different interest groups come together to discuss and find solutions regarding a common problem, for example, a water shortage in their village. Venues, where more than one stakeholder meet to exchange, are not automatically an MSP. There needs to be a common problem, conflict, or crisis, however differing interests among the various affected stakeholders, and these stakeholders collectively aim at solving the challenge. Thus, in our understanding, an MSP is a collective learning, negotiation, and decision-making body aiming towards better governance of problems despite differing interests of the various affected stakeholders. MSPs may facilitate conflict resolution when they offer spaces to nurture common understanding and trust among stakeholders. They may enable stakeholders to negotiate potential solutions in a neutral setting and, if effective, results may have broader ownership [24]. A central element of MSPs is the collective learning among the multiple stakeholders, also referred to as social learning in group processes that goes beyond individual learning, to strengthen knowledge creation and solution finding, and to increase common understanding, constructive relations, and trust among stakeholders [25,26]. However, recent studies indicate that these widely assumed merits of MSPs may be limited in contexts with strong power imbalances and longstanding, entrenched conflict histories, because they may undermine preconditions for MSP effectiveness, in particular the willingness and capability among stakeholders to engage cooperatively and equally [21,27]. Moreover, conflict histories and power imbalances may limit the potential to arrive at a shared problem-framing and MSP goals [21,27]. Nevertheless, there is only scarce evidence on: (i) whether MSPs are effective for conflict resolution with considerable power imbalances and entrenched land conflicts, such as in some oil palm landscapes, and (ii) the conditions for effective set-up and governance of MSPs in such complex and volatile contexts. Having evidence on effective as well as failed practices of MSPs in such settings would be urgently needed. Such evidence could contribute to underpin more sustainable development in the local context, but also prevent MSPs from re-enforcing existing inequalities or other consequences of failure. A mismanaged MSP in a fragile socio-political context could even be harmful, as it could, for example, increase or re-escalate pre-existing tensions, discrimination, or violence.

Against this background, the present article focuses on a case from southern Myanmar, Tanintharyi Region, where an MSP led by the civilian government after 2016 has tried to coproduce data and knowledge to resolve land conflicts around oil palm concessions—an ambitious endeavour in a challenging environment. The MSP was partly effective in its initial stages, however, faced increasing challenges in subsequent stages. This calls for a close analysis of the case to draw and provide lessons learnt for other MSP attempts in comparable settings. Thus, the overall aim of this study is to formulate recommendations for designing and governing MSPs on land conflict resolution in settings with entrenched conflict histories and strong power imbalances, such as in oil palm landscapes. We attend this aim by asking the following research questions (RQ): (1) How was the oil palm MSP in Tanintharyi Region designed and governed? (2) How effective was the MSP?

In this article, we start with presenting the land governance and historical context of Tanintharyi Region as well as an overview of the MSP's major events and development, to generate an understanding of the context in which the MSP operated. We proceed with describing the analytical framework and methods applied for data collection and analysis. The results section first provides documentation of how the MSP was designed and governed, shedding light on its strengths and weaknesses. Second, the results section analyses how effective the MSP was. In the discussion section, we start with reflecting on promising as well as hindering factors for the effectiveness of the MSP. We then discuss whether MSPs are a suitable approach in settings with strong power imbalances and entrenched conflict histories, such as in Myanmar's oil palm landscape. In the conclusions section, we argue that designing and governing an MSP in such a setting is a very challenging endeavour and needs to be performed very carefully—if at all. We formulate preliminary recommendations for (a) designing and governing an MSP in such settings as well as (b) for further research. Thus, the novelty of this study is two-fold. Firstly, it provides new in-depth knowledge on an MSP case from Myanmar's oil palm landscape. It shows how persisting power imbalances in combination with weaknesses in the design and governance of the MSP undermined the ability of the MSP to co-govern decision-making processes on land conflicts. Secondly, the developed framework and recommendations provide a useful starting point for scientists and practitioners to design, govern, analyse, or monitor an MSP in a similar setting.

Readers kindly note that the MSP as well as the research took place before the military coup of 2021. The present article does not refer to the coup itself or the time thereafter. For safety reasons, we refrain from naming most of the Myanmar stakeholders in what is now a politically unpredictable context, even though there is no connection between the research or the analysed MSP and the coup.

2. Context

2.1. Land Governance in Myanmar

Myanmar has experienced one of the world's longest running civil wars, starting shortly after its independence from the British Empire in 1948, and continuing through periods of military dictatorship from 1962 until the 2010s. The fighting was mainly concentrated in the ethnically diverse borderlands [28]. Especially in these borderlands, armed conflicts have resulted in continued humanitarian crises and countless internally displaced people and refugees in the neighbouring countries [7,28]. During this era, land governance was determined by formal and informal institutions favouring the well-connected and rich domestic elite, including the military high-ranking officials [12,13,29,30]. Many large-scale land concessions were granted between 1988 and 2010, but particularly to those who already had access to political and economic resources such as military-linked companies [29]. Many land appropriations occurred in the borderlands, which are usually lands of ethnic minorities, of which many are using a customary system [31], fuelling already existing armed conflicts. The 1990s and 2000s saw the land of rural communities expropriated in the name of national development projects (agribusiness, resource extraction, hydropower, etc.) or in the name of national defence for security reasons, military encampments, and

food and other goods' production to support military personnel [31,32]. Most investors in Myanmar during these times were typically linked to the military and/or members of the rich Burmese (predominant ethnicity) elite [29,31,33,34].

The passage of the 2008 Constitution, issued under the military regime, paved the way for a semi-civilian rule, albeit where the military was guaranteed 25% of the seats in parliament and an effective veto on constitutional reform [35]. Through general elections, the military-backed Union Solidary and Development Party—with many of its members being (ex-)military members in civilian clothes now, instead of in uniform—formed the government in 2011–2015. This period was marked by various regional ceasefire agreements as well as a national ceasefire agreement in 2015. During these years, many land reforms were enforced by this semi-civilian government. These reforms also pushed land formalisation and thus heavily influenced tenure rights and investment incentives [7,29], promoting formal tenure rights over customary land management systems [35], again mainly favouring the elite [30]. The result was an increase in domestic and foreign investment in natural resources and land, but most of them were still connected to the politically and economically powerful elite [31,33,34]. Simultaneously, the semi-civilian government recognised the long legacy of land confiscations across the country and the respective anger in civil society. During its rule, it started to establish several committees at various administrative levels to document and solve land conflicts, and began a process to draft a new National Land Use Policy, resulting in consultation processes [35].

In 2015, the opposition party, National League for Democracy, under the leadership of Aung San Su Kyi, won the first democratic elections in decades by a landslide. Consequently, a mostly civil government led the state affairs in 2016–2020 (still with 25% of parliament being military members). After coming into power, the civil government halted some of the committees and the National Land Use Policy process established in 2011–2015 [35]. At the beginning of the civil government era, the Myanmar multi-ethnic population and land activists had a rather positive attitude toward and trust in the civil government. After several months, however, criticism increased about, for example, the continued—or partly even increased—ignorance of customary land management systems, ethnic land rights, and gender-related issues [35]. After several years in office, the civil government began to resume halted or to establish new land committees and consultation processes, and to implement pro-farmer articles of the National Land Use Policy, while some other struggles and contradictions continued to remain [35].

The military coup of 1 February 2021 put an abrupt end to the democratisation processes, with an uncertain future for land governance in Myanmar.

To date, Myanmar's land governance has been characterised by an opaque legal pluralism. Over decades, the different regimes and governments had created "stacked laws" [29]. This term implies that Myanmar has multiple layers of laws that exist simultaneously, leading to conflicts, contradictions, and arbitrariness in the legal system. Moreover, many of them are often kept on a rather general level of formulation, allowing for ambiguity or manipulation in interpretation. Accordingly, powerful stakeholders could—and can continue to—enforce or adhere to the most beneficial law or policy in the given situation, deliberately favouring one law, policy, or interpretation out of the many [29].

2.2. Civil War and the Oil Palm Sector in Tanintharyi Region, Myanmar

Myanmar's mountainous and resource-rich borderlands, usually home to ethnic minorities, were severely affected by the civil war [28,36–38]. Tanintharyi Region is situated in the south of Myanmar and is one of these borderlands. The war in Tanintharyi Region prevailed until 2011 and was fought between the Myanmar military (predominantly persisting of the ethnic majority) and armed organisations of ethnic minorities [7]. The transformation to a semi-civilian government in 2011/2012 led to a regional ceasefire agreement [7,30]. Once armed conflicts declined in 2011/2012, some internally displaced people and refugees returned to their homes. However, many still remain in provisional camps in-country or in Thailand, or settled elsewhere due to the loss of their land to land grabs during their

absence, environmental damage of their natural resource base as a result of war, fears of violence, and eroded infrastructure or social institutions [39–41].

In the late 1990s, the military-led government of Myanmar promoted oil palm with the main aim of achieving self-sufficiency in edible oil production. Under this policy, Tanintharyi Region was promoted as the oil bowl of Myanmar [42–44].

To achieve this plan, large land concessions—later turned into legal permits and contracts—for planting oil palm were granted to private and military-backed companies under the 1991 Wasteland Instructions, which later became the 2012 Vacant, Fallow, and Virgin Lands Management Law, and the 1992 Forest Law and subsequent forest policies [7,12,42]. These legal provisions have been widely criticised for failing to recognise the customary land tenure of local communities [45]. Additionally, many of the granted land permits were rather inaccurate in terms of geographic location [42] and frequently did not consider the existence of villages in these areas. Furthermore, local organisations and researchers have identified the oil palm sector as a leading cause of deforestation, especially in the southern Tanintharyi Region [34,44,46–48]. Moreover, the expansion of oil palm has also reduced the local population's access to natural resources, which are of high importance for their livelihoods, such as for agriculture or for collecting non-timber forest products [30,49]. The local population also did not experience any economic benefits, as the companies offered very low salaries only and, as a consequence, poor migrant workers from central Myanmar settled in to work on the plantations [12].

Scholars as well as some respondents of this study (to remain anonymous) also argue that the military-led government used the handing over of oil palm concessions to companies to gain physical access for its troops to the remote areas, which were, for a long time, mainly under the control of the ethnic armed organisations [7]. Apparently, some companies were even pushed into implementing an oil palm concession. Through the building of physical infrastructure (roads, housing areas, etc.) and the opening up of the dense forests by the companies, the military could increasingly reach these areas and strengthen its territorial control [7].

The consequence of the granting of oil palm concessions and the development of plantations were manifold [7,10,12,34,50,51]. Some villages were dislocated against their will or, if the settlement area was spared, the villagers lost their cultivations around their villages. Human rights violations were reported from many cases. In various places, empty villages, which had been abandoned due to the war and the fleeing of the residents, had been cleared and returning IDPs and refugees found "their" land to be a monoculture or under the possession of a company. The legal provisions mentioned above, which made the large-scale oil palm permits possible, were in favour of the politically and economically strong elite [30], while smallholder farmers were hampered by a rather weak statutory recognition of their land tenure [13].

In 2016, when the democratically elected Tanintharyi regional government took office, the new Regional Chief Minister announced in her election speech that she would address these land conflicts around oil palm concessions.

2.3. The Background and Story of the Multi-Stakeholder Platform

The semi-civilian government of 2011–2015 initiated the OneMap Myanmar (OMM) Initiative, which was also continued under the civilian government. The OMM Initiative is a Myanmar government-led initiative aiming at providing access to accurate, consolidated, and user-friendly data related to people, land, and natural resources, in order to make decision-making and planning for sustainable development more effective [52,53]. With funding support of the Swiss Agency for Development and Cooperation (SDC), the Myanmar government together with the SDC launched an international project call to support the OMM Initiative in its implementation. Consequently, an OMM Project was launched in 2015 (and dissolved again after the military coup in 2021). The implementing organisations of this OMM Project were a Myanmar civil society organisation (anonymised) and the international, Switzerland-based sustainability research institute Centre for De-

velopment and Environment (CDE) of the University of Bern. One specific government department from the national level (anonymised) was acting as the focal line department for the OMM Project and therefore serving as a connector between the OMM Project and the Myanmar government.

On 22 September 2016, the OMM Project visited the Regional Chief Minister of Tanintharyi Region after she had publicly announced that she aimed at resolving the countless land conflicts around oil palm concessions. The OMM Project presented the idea to her of launching an MSP. She appreciated this idea and called for a meeting with various governmental ministries and departments (regional level) the next day, in which the OMM Project presented the idea of an MSP again. Everyone agreed to launch the MSP. Table 1 presents an overview of the major events in the MSP process as well as in the land governance related to the overall palm oil sector.

Table 1. Major events in the multi-stakeholder platform (MSP) process and in the land governance related to the palm oil sector.

When	Major Events	MSP Involved
8 October 2016	Interim MSP meeting to agree on a nomination process for the formal MSP.	
20 December 2016	Formal launch of the MSP, with representatives from the government, companies, civil society organisations (CSO), and one of the ethnic political organisations (EPO). Main decision/request (by government group): start with mapping oil palm concessions in Yebyu Township.	
February to March 2017	Detailed mapping of oil palm concessions in Yebyu Township by the OMM Project: collection and digitalisation of concession permits, drone mapping of planted area.	yes
16 March 2017	Formal MSP meeting to present and discuss insights from concession mapping in Yebyu Township. Outputs: less feedback on mapping procedure and maps, but request to focus more on the plot-level documentation of land conflicts (through mapping).	
April to August 2017	Formation of a Yebyu Township multi-stakeholder committee to steer and implement the forthcoming field surveys (plot-level analysis and mapping). Several meetings of the Yebyu Township committee and intense field surveys around one concession took place. Output: very detailed report on one concession, including maps and recommendations for further technical and political actions (published by the Yebyu Township committee with strong support of the OMM Project).	yes
April to August 2017	Formation of identical multi-stakeholder committees in Bokpyin and Tanintharyi Townships. No actions taken yet.	yes
April to June 2017	The Regional Chief Minister requested the OMM Project directly to map five concessions under National Myanmar Investment Commission (MIC) agreements. The MSP was not consulted. After being hesitant, the OMM Project mapped the concessions based on satellite images and the formal permits.	no
15 and 16 August 2017	Cross-level MSP meeting (regional-level MSP and all three township committees) to present and discuss on: (1) the detailed concession report from the Yebyu Township committee, (2) the mapping results of the big MIC concessions, and (3) plans of the regional-level MSP and each township committee for the coming six months. Outputs: (1) heated discussion but no decisions on the detailed report by the Yebyu committee, and recommendation by the OMM Project to do a regional assessment (mapping and analysis) of all concessions in Tanintharyi Region on a broader scale, no more plot-by-plot mapping, (2) feedback that the MIC concession maps were wrong, without further discussion, and (3) jointly agreed action plans for the coming six months.	

Table 1. *Cont.*

When	Major Events	MSP Involved
October to December 2017	The national MIC group spontaneously visited the five oil palm concessions under MIC agreements to review the situation on the ground, with the intention to revoke permits for unused concession land. The OMM Project was invited to join and assisted with mapping. The report by MIC (based on the field visit) was shared with the regional government for input and feedback. The MSP was neither consulted nor informed.	no
December 2017	Considerable encroachment by villagers on the surveyed oil palm concession in Yebyu Township as an indirect consequence of the detailed report (as some form of vigilantism).	no
January 2018	Reminder by national-level government to Yebyu Township (after having read the detailed report from the first concession), stressing that township- and regional-level governments cannot simply revoke land from concessions and distribute it to villagers without consulting the national level.	no
December 2017 to early 2018	Meetings of the township-level committees: The Tanintharyi committee was very poorly attended, while the Bokpyin committee was well-attended but lacked leadership and orientation. No further actions taken. The two committees never met again. The Yebyu committee decided to make a similar mapping of one more concession. When presenting the maps to the company, government representatives, the EPO, and villagers, the discussion escalated due to the longstanding land conflict history and the villagers demonstratively left the room. The Yebyu committee never met again. Result: all township-level committees fell apart.	yes
Early 2018	Some CSO representatives informed that they would officially leave the MSP if no further actions with or consultations of the MSP would be conducted. Nevertheless, the non-consultation continued.	no
Early 2018 onwards	Internal challenges inside the OMM Project (personnel, internal disagreements, time availability, etc.) as well as lacking access for the OMM Project by various government departments to concession contracts, which would have been necessary to start the regional assessment proposed in the August 2017 MSP meeting. The mapping was considerably delayed. The MSP was neither consulted nor informed.	no
Early 2018 onwards	The regional government takes further serious actions regarding oil palm concessions: It decided not to grant any other oil palm concessions anymore, cancelled pending permit requests, cancelled old rubber and oil palm concession permits issued under the military regimes, which had not been implemented, and started a survey to explore which land could further be taken back from the concessions. The MSP and OMM Project were neither consulted nor informed.	no
June to September 2018	Extensive regional assessment by the OMM Project of oil palm concessions based on site visits, some satellite images, scale mapping, and interviews (in collaboration with companies and government departments) to prepare a regional overview of the oil palm sector. Output: extensive report, publicly available (published in 2020).	no
June 2018	Urgent request by regional government departments to the OMM Project to visualise land areas (on maps), which can be revoked from concessions. These maps were intended to be used when discussing with the national MIC group. After being hesitant, the OMM Project produced such maps but stressed clearly that these maps should not form the basis of any decisions. The OMM Project did not know how these maps were used further.	no
August 2018	National MIC announces to confiscate over 40,000 ha from the unproductive MIC concessions and invites domestic and foreign investors to apply for these lands [54].	no

The MSP meeting in August 2017 marked an important meeting, in which the above-mentioned report from the Yebyu committee was presented and intensively discussed. One major insight was—as a result of repetitive stressing by the OMM Project—that the extensive field survey and plot-by-plot report, which had been achieved in Yebyu Township, were not replicable to other concessions and other townships. It would take too long a time as the concessions were so many and mostly very large. Moreover, the regional-level MSP members agreed (after several hours of group work) on specific points to tackle over the next months: (1) To clearly describe the mandate of the MSP, as there were still many unclear points from the perspective of many participants. (2) To agree on some coordinative issues of the meetings, such as how often the meetings should take place, how far in advance participants should be invited, what topics to include in the discussions, how to spread information, how many representatives would need to be present for making decisions, etc. (3) To make an orientation meeting with all 44 oil palm concession-holding companies to inform them about the forthcoming mapping activities. (4) To conduct a legal analysis on the surveyed concession in Yebyu Township to learn more about land zones, options for revoking land from the company, distributing land to villagers, etc. (5) To agree on how exactly to continue with the mapping of concessions, as extensive field surveys now seemed impossible to replicate to all concessions.

Although the plans of the regional-level MSP members seemed optimistic and the uttered commitments constructive, from then on, many external and internal challenges arose, as described in Table 1. An MSP meeting was repeatedly postponed, but the MSP never met again. It was also not formally closed.

3. Methods

3.1. Analytical Framework

To analyse the design and governance of the oil palm MSP in Tanintharyi Region, Myanmar, we developed and adopted an analytical framework that draws on literature on MSPs and social learning from the fields of land governance and natural resource management. We included those studies which described recommendations or lessons learnt regarding MSPs based on practical experience of the authors or scientific synthesis. Further, we included studies which developed and used conceptual or analytical frameworks themselves for studying MSPs and other multi-stakeholder processes, or which presented conceptual frameworks as a result of their studies. The literature was searched and screened by a general online literature research. The ultimate articles were selected based on the first, second, and fourth authors' personal assessment of the articles' quality and usefulness for the purpose of this study (see also limitations of the study, Section 5.1.3). The complete list of literature integrated in our analytical framework can be found in Table 2.

Table 2. Analytical framework.

Phase	Dimensions	Criteria for Effective MSPs	Sources
Set-up a multi-stakeholder platform (MSP)	Management and representation of boundaries	• Adequate inclusion and exclusion of stakeholders (and those that they represent) • Communication and engagement strategy for the excluded stakeholders • Matching constituencies and competences of the stakeholder representative (between her/his role in the MSP and in the represented organisation) • Linking stakeholders inside and outside the MSP across multiple scales and from different levels (for more effective collaboration and systemic change)	[21,22,55]
	Initialisation and preparation of an MSP	• Situation and conflict analysis (stakeholders, institutions, power, politics, etc.), development of conflict sensitivity approach • Clarity of reasons for establishing the MSP • Establish interim steering body • Build stakeholder support for the MSP • Establish scope and mandate of the MSP, including decision-making competences of the MSP • Outline process and time horizon of the MSP	[22,24,56]
	Secured resources	• Sufficient financial funds • Sufficient time • Sufficient and the right human resources • Sufficient and the right equipment	[21,24]
	Access to decision-making	• Access to wider (cross-sector) policy-making and governmental top-level decision-making processes	[21,57]

Table 2. *Cont.*

Phase	Dimensions	Criteria for Effective MSPs	Sources
Run an MSP	Adaptive (flexible) and effective management of the MSP	• Legitimate and effective management structures • Efficient and effective coordination of the meetings • Legitimacy of decisions and processes • Adaptive capacity (flexibility) in planning and management • Detailed but adaptive action plans • Commonly agreed-on strategies for change • Definition of success criteria and indicators • Development and implementation of monitoring mechanisms • Revision of progress, reflection on lessons learnt and feedbacks	[24,55,57]
	Constructive stakeholder and relations management	• Trust among the participants • Understanding among the participants (including critical self-reflection, acknowledgement of problems and expectations of participants, overcoming prejudice, etc.) • Definition of roles, responsibilities, and decision-making competences of participants/the groups • Consensus among participants (vision, expectations, rules of the game, etc.) • Strong stakeholder ownership and commitment, collaborative leadership • Equity and inclusiveness • Dealing with influential stakeholders inside the MSP • Effective conflict management • Joint activities of the participants	[21,24,25,55–61]
	Effective communication and facilitation	• Constructive facilitation during MSP meetings, including powerful questions of the facilitator(s) • Active (and if possible, equal) participation in communication of all participants • More dialogue, less debate • Non-violent communication • Active listening of all participants • Joint language and communication style • Timely and transparent communication to everyone (during and between meetings) • Effective and transparent communication with non-participants and the public	[21,24,55–58]

Table 2. *Cont.*

Phase	Dimensions	Criteria for Effective MSPs	Sources
Run an MSP	Culture of reflecting and learning	• Provision of time for learning and reflecting • Use of supportive methods and approaches • Effective collective reflecting and learning (on successes and failures, (dis)agreements, equality, norms, values, relationships, individual social-emotional competences, etc.)	[21,24,25,55,57–59,61–63]
	Technical support (expertise) to the MSP	• Sufficient and the right technical advice/support	[56]
	Collective action for systemic change	• Willingness to change • Embrace complexity and a change of the system • Development of skills and capacities for action • Collaborative action outside the MSP meetings, including identification of actions, responsibilities for actions, and management of successful implementation • Transformation of institutions	[21,24]
Close an MSP	Closure of an MSP	• Development and adaptation of an exit strategy (e.g., how a continuation after the MSP, after external support, or after the facilitation, etc., would look) • Revision of the MSP process and draw lessons learnt (e.g., expectations, goals, outcomes, strengths, weaknesses, success, failure, monitoring) • Official closure of the MSP (e.g., closing event, final reporting, final communication to the public)	[24,56]

3.2. Data Collection and Analysis

As will be described in the results section, the MSP was founded at the regional level, Tanintharyi Region. After several months, multi-stakeholder committees were also created at the township level (see Figure 1). Our focal unit of analysis is the regional-level MSP, Tanintharyi Region, rather than the township-level committees. Nevertheless, we included incidents from the township level, which were relevant for the regional-level MSP's effectiveness. The rationale for the focus on the regional level has multiple elements: Firstly, data accessibility for the researchers was higher for the regional level than for the township levels. Secondly, strategic decisions on goals, outputs, etc., were to be taken at the regional-level MSP, while township-level committees were designed to implement these decisions. Thirdly, the regional-level MSP was meant to have access to higher-level, political decision-making, potentially influencing land conflict resolution for the entire region rather than single local cases. However, the regional-level MSP should not be analysed as an isolated MSP, but must rather be understood against its broader context of, for example, major events outside the MSP, the creation of the township-level committees, or mapping challenges.

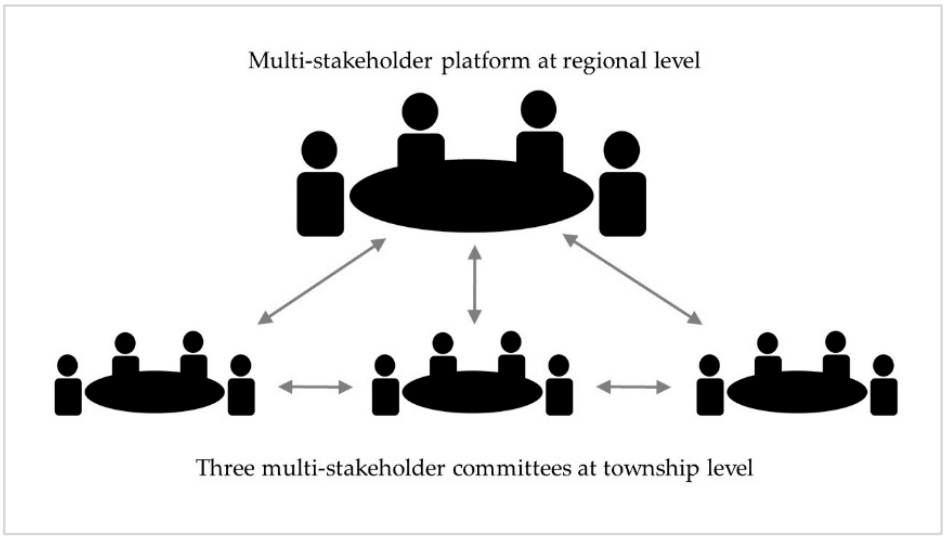

Figure 1. Overview of the regional-level multi-stakeholder platform and the township-level committees.

For the present study, qualitative methods were applied. The main data collection period conducted by the first and second authors of the present study lasted from October 2016 until March 2019. During this period, the data collection methods encompassed participatory observation and writing of meeting minutes in the MSP meetings, in-depth semi-structured expert interviews, as well as short narrative interviews with OMM Project staff. Most data were collected by the first author of this paper, often in collaboration with a Myanmar research colleague (anonymous). Some of the data were collected by the second author of this paper. In August 2021, the first author additionally conducted a short, written, retrospective self-evaluation with OMM Project staff regarding the achievements of the MSP. Table 3 provides the details of data collection.

Table 3. Details of data collection (MSP: multi-stakeholder platform, OMM: OneMap Myanmar).

Method	When	With Whom	Comments
Writing or accessing meeting minutes of the MSP meetings	October 2016, December 2016, March 2017, August 2017 (n = 4)	All MSP participants	October 2016: minutes written by focal line department All other meetings: minutes written by first author and Myanmar research colleague
Participatory observation in MSP meetings	December 2016 (n = 1; half day)	All MSP participants	First author and Myanmar research colleague participated, taking notes of observations (e.g., sitting order, atmosphere among participants, etc.), taking pictures, and writing meeting minutes (see above)
	March 2017 (n = 1; half day)	All MSP participants	Same as March 2017
	August 2017 (n = 1; 2 full days)	All MSP participants, also township-level MSP participants	None of the authors could attend. The Myanmar research colleague joined the MSP meeting and documented it with videos, pictures, note taking of observations, and detailed meeting minutes (using audio recordings).
In-depth semi-structured expert interviews (with OMM Project)	April 2017, August 2017, March 2018 (n = 3)	OMM, chief technical advisor	1 conducted by first author and Myanmar research colleague, 2 conducted by second author. All interviews were audio-recorded and transcribed.
	August 2017, October 2017, November 2017, February 2019 (n = 4)	OMM Project technical staff	2 conducted by first author and Myanmar research colleague, 2 conducted by second author
	January 2018, March 2018 (n = 2)	OMM Project facilitator of the MSP	1 conducted by first author and Myanmar research colleague, 1 conducted by second author
	September 2017 (n = 1)	Focal line department representative (the coordinator of the MSP)	Conducted by first author and Myanmar research colleague
Short narrative interviews (with OMM Project)	Frequently between April 2017 and March 2019 (n = 12)	OMM Project chief technical advisor	Conducted by first author, usually without audio-recording
	January 2018 (n = 1)	OMM Project technical staff	Conducted by first author, without audio-recording
Retrospective self-evaluation (with the OMM Project)	August 2021	Former and present OMM Project technical staff and chief technical advisor (n = 3)	Short written survey with multiple-choice and qualitative questions on the achievements of the MSP; conducted by first author

For analysing the data regarding the MSP's design and governance (RQ1), we conducted a thematic content analysis, by coding all available data according to the analytical framework (see Table 2). For analysing the data regarding the effectiveness of the MSP (RQ2), we refer to the term "effectiveness" as the extent to which the MSP contributes to solving or mitigating the problems that were the source of motivation for the stakeholders to join the MSP [64]. Thus, in this study, we determine the effectiveness by analysing whether the originally communicated overall goal of the MSP, which served as a motivation for the stakeholders to join the MSP, was achieved. Accordingly, we proceeded in two steps for the data analysis regarding the effectiveness of the MSP. Firstly, we identified the communicated overall goal(s) of the MSP (using all available data sources). In a second step, we compared these communicated goal(s) with the actual achievements, which we also

compiled from all the available data sources. For the discussion section on promising and hindering factors of the MSP, we interpreted the results from RQ1 and RQ2 with the help of relevant literature on good practices and lessons learnt from MSPs and social learning.

4. Results

4.1. Design and Governance of the Multi-Stakeholder Platform

The following section presents an overview of the design and governance of the MSP. For a detailed description of results per criteria along the analytical framework (see Table 2), kindly consult Appendix A.

4.1.1. The Set-Up of the Multi-Stakeholder Platform

Management and Representation of Boundaries

In the meeting on 8 October 2016, the nomination process was jointly defined. The formal launch of the MSP took place on 20 December 2016. The participants of the MSP were as follows:

- Government group: Regional Minister of Agriculture, Livestock, and Irrigation as the chair of the MSP, Regional Minister for Natural Resources and Environmental Conservation as first vice-chair, Minister of Ethnic Affairs as second vice-chair, and six departments, each sending either their director or an assistant director.
- Civil society organisations (CSO) group: six CSOs were nominated after the CSOs of Tanintharyi Region had jointly discussed who to delegate.
- Companies group: The companies relied on an existing agreement they had among the oil palm companies, saying that two companies per administrative district would represent their group. Accordingly, in total, six companies were nominated to join the MSP.
- Ethnic political organisations (EPO) group: from the two invited organisations, only one agreed to join the MSP.
- OMM Project: The OMM Project was present as the technical advisor regarding the mapping (including foreign experts). A senior Myanmar member of OMM Project—a well-respected and well-connected senior expert in land politics and leader of Myanmar CSO—served as the facilitator of the MSP. The representative of the focal line department (national level) joined with the OMM Project team.

To our knowledge, there was no communication or engagement strategy for those who were excluded from the MSP. At the beginning of the MSP, it was recommended that the representatives of each group would be responsible to communicate back and forth between the MSP and their networks.

For an MSP to be effective and thus lead to a systemic change, it is important that the constituencies and competences of the representative inside the MSP are matching with her/his constituencies and competences back in the organisation she/he represents. As can be seen in more detail in Appendix A, these were partly matching and partly mismatching.

Initialisation and Preparation of the MSP

Prior to establishing the MSP, the OMM Project performed a situation analysis on the various stakeholders in Tanintharyi Region, including a conflict analysis. There was no analysis of the land governance system carried out for Tanintharyi Region. There was also no conflict sensitivity approach developed for the endeavour. The OMM Project relied on the sensitive guidance by its senior Myanmar members, who were familiar with similar settings.

The reason for establishing the MSP was that the Regional Chief Minister wanted to tackle the land conflicts related to oil palm concessions. At the opening speech of the October meeting, one of the MSP chairmen added (translated from Myanmar language):

> *"We are facing challenges for getting the complete information of basic land use, land cover, and land ownership. These challenges may be problematic for the transparency*

and accountability when it comes to land problems. Therefore, a spatial data platform is necessary to have access to land-related data and numbers." [65]

The stakeholder support for creating the MSP was probably rather ambiguous among the groups and even within the groups. For all groups, it is unclear whether the representatives joined the MSP for reasons of wanting to contribute to a systemic change or for averting risks in case of non-participation. This might even differ for each individual and it might also be a combination of both.

In the first and second formal MSP meetings, the terms of reference—comparable to a mandate of the MSP—were presented. There was a very short slot for questions and comments on the terms of reference, but no MSP participant raised concerns or questions. The terms of reference were as follows:

1. To guide and supervise the OMM Project's tasks for investigating the oil palm sector.
2. To collaborate with relevant government institutions and organisations to access data, maps, and other information.
3. To collect the relevant data and then analyse it. If needed, supervise the field surveys.
4. To supervise and guide a technical unit (OMM Project technical staff) so that the unit finishes the tasks according to the timeline for investigating the oil palm sector.
5. To supervise the reporting of progresses and work planning.

Later, the OMM Project additionally presented its ideas of what the MSP could aim for over the months and years to come. There were four major steps in the presented pathway. The first step was the land use assessment (using mapping techniques). The second step was titled with resolution of land disputes and land use planning for remaining land. In a third step, an assessment of the quality of investments in the oil palm sector was envisioned. In the final step, the pathway showed that the MSP could support to develop sectoral policies and approaches to a sustainable oil palm industry. This was, however, never formally discussed or approved. Other than this, there was no presentation or discussion on the entire process and time horizon of the MSP.

Secured Resources

Almost all financial expenses for the MSP and the implementation of activities were covered by the OMM Project, such as travel expenses of MSP participants, in-kind contribution of the OMM Project for its staff, technical equipment for mapping, satellite images, etc.

Given the envisaged overall duration of the OMM Project, the project could have accompanied the MSP for six or seven years. The time horizon of the MSP, however, was not pre-defined. The bigger time-related challenge might have been the limited availability of most representatives given their partly high ranks and many engagements outside the MSP.

Having access to enough and the right human resources is also a prerequisite for an effective MSP, especially when it comes to the implementation of the activities outside the MSP. In our case, the OMM Project (the implementer of activities) brought the right human resources for the mapping. However, there seemed to be a lack of technical expertise in other dimensions (see below, section: technical support to the MSP).

From all types of resources, the equipment seemed to be the smallest challenge. The OMM Project could mobilise most of it.

Access to Decision-Making

For the government group and for the OMM Project, it was understood—but not formally communicated to the other MSP participants—how the access to decision-making was conceptualised. The MSP was led by three regional ministers and supervised by the Regional Chief Minister. These four high-ranking officials were also members of the regional government cabinet, where political decisions for Tanintharyi Region were discussed. The MSP was supposed to serve as a consultation body for and advice provider to the ministers, who would in turn try to influence the regional government cabinet or even the government representatives from the national level. Moreover, the relevant

land-related regional-level governmental departments were represented in the MSP. Thus, access to decision-making bodies was given with the structural organisation of the MSP. This, however, was not clearly communicated to the MSP until only August 2017.

Despite the rather well-designed access to decision-making, the effective access to the government cabinet and relevant government departments still depended on the willingness and ability of the ministers and department heads to lobby for what was discussed in the MSP.

Access to decision-making was also—in some ways—not given due to the lack of transparency of and clarity on structures and mechanisms in the land governance system (see Appendix A). Even government staff did not fully understand the entire complexity of Myanmar's land governance system. Thus, it remained rather opaque for most MSP participants which body (at which administrative level) to approach for certain decisions.

4.1.2. How the Multi-Stakeholder Platform Was Run

Adaptive and Effective Management of the MSP

The MSP was managed highly adaptively. Usually, the outlook on future actions had to be considerably revised after each meeting. It seemed as if the OMM Project and the MSP were on a very explorative path, as no such MSP had taken place before in this regional context and as the complexity around land conflicts and land governance was very high. The management, however, was also highly complex due to government protocols. The process from obtaining a meeting permission to sending out invitations lasted between two to four weeks. Accordingly, the invitations usually arrived to the MSP participants at the last minute, which made it sometimes impossible for the delegated representatives to attend themselves. It was not allowed for the OMM Project to contact the participants directly. Thus, the coordination of the MSP was legitimate in the given context, however, noticeably not sufficiently effective or efficient. One of the OMM Project members stated in an interview:

"*It's very challenging in terms of managing the process, because it is unmanageable.*" [66]

The decisions made in MSP meetings were usually made in a repeating pattern. The facilitator (senior expert) suggested a decision based on either bilateral discussions prior to the meeting with members (also within the OMM Project) or based on discussions during the MSP meeting. Usually, no one made any major objections, and his suggestions were silently taken cognizance of. Thus, one could say that decisions and processes were legitimate as there were never any major objections during the meetings. However, it is also possible that MSP participants refrained from making comments due to lacking understanding on the discussion topic, feeling outside their comfort zone or field of responsibility, power imbalances, government protocol, and cultural codex of behaviour.

Constructive Stakeholder and Relations Management

At the very beginning of the MSP in October 2016, trust was greatly lacking, especially on the CSO side, but probably also among the other groups. Later, however, the CSOs also seemed committed to continue the collaboration, as it appeared to be a unique chance for tackling the entrenched land conflicts around oil palm concessions. This seemed to be a considerable progress given the decades-long conflict-affected history of the Tanintharyi Region.

At the beginning, only the roles of a few stakeholders were defined. The three regional ministers held the formal leading position of the MSP. It was also communicated clearly that the OMM Project as an outsider to the Tanintharyi Region did not have any decision-making competences, but that it served only as a technical advisor, enabler, and implementer of and for mapping activities. One of the chairmen stated it this way (translated from Myanmar language):

> "*We want to benefit our own country and own people. Foreigners want to help Myanmar. But the foreigners have no decision power, only the regional government has. The foreigners will only collect data and operate, and also pay for all expenses.*" [67]

Only in August 2017 were the decision-making competences of the MSP clearly communicated to the members, saying that the MSP would be limited to formulating recommendations and requests to the regional government. Additionally, the roles and responsibilities of the different groups have never been specifically discussed, nor the roles and responsibilities of each individual stakeholder. The CSOs repetitively pointed out this deficit, however, the MSP did not react to it anymore before it fell apart. The lacking definition of roles, responsibilities, and decision-making competences led to an increasing frustration on the side of CSOs and the OMM Project.

The ownership and commitment among the stakeholders differed among the groups and even within the groups, and rather depended on the individual representatives. The ownership and commitment of the government group seemed quite high at the beginning, however, the willingness to consult the MSP decreased drastically with rising challenges. As the government group was by no means homogenous, the commitment and leadership also heavily depended on the participating individual. The government representatives, however, changed often due to frequent position rotations and unavailability. On the CSO side, ownership and commitment seemed quite high at some points in time and then again, they appeared to be on the brink of quitting their membership in the MSP due to frustrations. The companies, on the contrary, were mostly quite silent (but not opposing). Some of the companies did not send their top leaders, but lower-level representatives with less decision-making competences, thus, most likely also less discussion-making competences. The ownership and commitment from the side of the EPO seemed unclear from beginning to end. They never sent high-ranking delegates, nor did they participate in discussions.

There were many efforts by the facilitator of being inclusive and treating everyone equally. The facilitator also had a very good systemic understanding and feeling for detecting the influential stakeholders. Further, he was familiar with the complex hierarchies inside the government. As well as acknowledging the formal power structures, he also considered the informally influential individuals. He respected the power setting and dealt with the influential stakeholders by proactively providing them space for talking, asking them specific questions (most likely to foster their learning effect, increasing their willingness to collaborate, and/or to test the feasibility of an idea), or by making sure they had good seats.

Joint activities are known to be helpful for fostering constructive relations among the MSP participants. Apart from lunches and tea breaks, where most groups sat among themselves, there were no joint activities of the MSP members. There were also no other social activities during the MSP meetings. Probably, the setting was too formal and the conflict histories between the stakeholders too entrenched.

Effective Communication and Facilitation

The facilitation of this MSP was of considerable importance. The interim MSP meeting in October 2016 (see Appendix A) proved that a facilitator was needed, who knew how to bring groups to one table, which had been in conflict for several decades. The facilitator, a Myanmar member of the OMM Project, was a senior and well-connected land and facilitation expert. He usually sensed the expressed but also the unexpressed feelings in the room. Noticeable, however, he paid special attention and politeness to the more influential persons in the room (see above), less so to the less relevant stakeholders. In an interview, he confirmed that he would especially focus on the positive learning of the more influential persons, as he believed that the MSP would only make progress if the most influential supported it:

> "*When, in a process, the most powerful and the least powerful are involved together, target the most powerful to change their mindset first. Without that, collective learning cannot happen.*" [68]

The facilitator also strategically led the discussions by providing summaries of speeches, asking powerful questions in a certain direction, highlighting the main points of the meeting from his perspective, or by presenting suggestions of how the MSP could decide on an issue.

Noticeably often, the chairmen and the facilitator motivated all participants to be active, open, and polite in their communication and invited everyone to equally participate. The facilitator stated the ground rules for a polite communication in the following way (translated from Myanmar language):

> "*We will base on good will, cooperation, mutual respect, common goals. We will not base our interaction on emotions, but on good intentions. The tone and the language we are going to use must be polite. Otherwise we cannot collaborate.*" [69]

Even though the different groups experienced decades of entrenched land conflicts and war, at most times, the communication in the MSP meetings was non-violent, with rare incidents of indirect shaming and blaming. The participation, however, remained rather unbalanced among the groups, as described in Appendix A. Additionally, the chairmen were conspicuously quiet. The facilitator invited them several times to express their standpoint on certain topics to get a feeling for their priorities as well as for the feasibility of ideas.

The discussions were usually held neither in a dialogue format nor as debates. Mostly, the communication was limited to presentations and question-and-answer slots after a presentation. The setting was probably too formal and the meetings too short (usually two to three hours) to let dialogue develop. As there were almost no dialogues happening and the MSP only existed for less than a year, the MSP never reached the level of a joint language (see Appendix A). This might be rooted in the problem that the MSP also did not have a joint problem-framing and vision, and/or that the MSP members did not know or express what data they needed to support different kinds of decision-making processes on land. Accordingly, the presentation of technical mapping results was probably disconnected from the needs or interests of the MSP members.

Timely and transparent communication to everyone seemed to be a major challenge, especially between the meetings—less so during the meetings. At almost every MSP meeting, some participants complained about late invitations (see above) and the lack of sharing meeting minutes or other information with everyone. One MSP member stated in the March 2017 meeting (translated from Myanmar language):

> "*What I would like to say: Since the first meeting, we did not get any information. Nobody gave any information. The staff said that the information letter will pass on. But we have not received it.*" [70]

Especially after the last MSP meeting in August 2017, there was a major lack of communication among the MSP participants. Additionally, the OMM Project failed in informing timely and transparently about the steps it undertook in the meantime for various reasons (see Appendix A), especially after August 2017. Additionally, the regional government did not communicate timely and transparently with the MSP. As outlined in Section 2.3, the regional government undertook some serious actions against oil palm concessions without consulting or informing the MSP. This lack of communication was looked on with disquiet or even resentment by some MSP groups. One of the MSP members put it the following way in the August 2017 meeting (translated from Myanmar language):

> "*[. . .] the Regional Chief Minister said that this issue [on a specific oil palm concession] will be decided in the cabinet meeting this morning. What we want to know is how much the report [created through the MSP] will be used and considered in the decision-making process. The report is finally out, but did the cabinet make a decision on its own? If that is*

> *the case, our participation in the leading committee [the MSP] does not make much sense anymore. That is why we would like to know how much of our input and suggestions will be considered and used by the regional government.*" [71]

Culture of Reflecting and Learning

Apart from the August 2017 meeting, there was not much conscious reflecting and learning, as time was always short and the setting formal. The second day of the August 2017 meeting was dedicated to group work, including reflecting on lessons learnt and the way forward. As it seemed, this was a successful exercise with promising outputs for the continuance of the MSP (see Section 2.3). Unfortunately, this was the last time the MSP came together.

The OMM Project also needed to learn and reflect. Due to the limited effectiveness of the MSP, the OMM Project also faced internal disagreements on the way forward, which it did not manage to resolve timely. These internal disagreements proved that this internal learning and self-reflection process did unfortunately not take place sufficiently or probably not with the most useful methods.

Technical Support to the MSP

From the beginning, it was clear that the MSP would need technical support regarding mapping (besides other expertise). The OMM Project could provide the right and sufficient technical support in this regard, as it seemed.

After the first extensive field survey of an oil palm concession in Yebyu Township, however, it became evident that the MSP was also in need of legal advice regarding land conflict resolution and rightful land use and ownership. Additionally, was there a need for expert support regarding understanding the land governance system of Myanmar. It was unclear what would happen to the revoked land, which department or which committee at which level would have the decision-making competences to resolve disputes, etc. The lack of such expert support was clearly identified by everyone in the August 2017 meeting. Afterwards, the OMM Project tried to mobilise respective technical support, however without much effect. It seemed difficult to find such experts and the MSP did not meet anymore afterwards.

It is also possible that the OMM Project could have benefitted from an expert in communication, facilitation, and conflict management from the field of peace- and state-building to advise the OMM Project on its challenging role and internal learning.

Collective Action for Systemic Change

According to various observations and statements by MSP members, most groups were willing to resolve land issues related to oil palm concessions. The perceptions of how exactly the addressing of land issues should be carried out, however, remained presumably different among the groups, even though it was not explicitly discussed. The complexity of the reality and the change thereof was a major issue. The OMM Project (including the facilitator) often reminded the MSP members of the complexity of mapping and that mapping is not free from being political and therefore needs to be done cautiously. The OMM Project also highlighted that "giving land back" to the local people is not as simple as it might seem, and that it can easily lead to new conflicts if not performed in a well-considered way. It might also have appeared disillusioning to some MSP members that the land governance system was highly complex, favouring mostly the elite, and could not be changed within a short time. Moreover, the MSP members themselves presumably did not have the capacities, competences, and probably also not the right skills to effectively address land issues.

The governmental stakeholders highlighted that the support by the OMM Project (for the MSP) was very useful to them, as it enabled them to access maps and better understand the challenges around the concessions in general. Probably, the serious actions on land governance in the oil palm sector taken by the government (see Section 2.3) might also

have been indirectly based on the OMM Project's mapping support. Hence, there were some actions indirectly resulting from the MSP, which had a strong impact on the system (e.g., revoking of oil palm planting permits). These actions, though, were not collectively taken within the MSP as originally intended and they also did not transform institutions much, as was probably hoped for by the CSOs or the OMM Project.

Due to all these reasons, the MSP never saw any collective action for systemic change.

4.1.3. The Closing of the Multi-Stakeholder Platform

The MSP was never officially closed. In August 2017, the last MSP meeting at the regional level took place. After that, there were several plans on the OMM Project's side to hold the next meetings. However, this was never realised, as the OMM Project itself was caught in challenges and could not ask for an MSP meeting without new outputs. For unknown reasons, the government side, as the formal MSP leaders (Regional Chief Minister or the other ministers), also never called anymore for an MSP meeting. It seemed as if the MSP started falling apart due to the major internal and external disturbances starting from December 2017, worsening until early 2019. After August 2017, it seemed that the old tensions between the stakeholders increased again, especially between the CSO group on the one side and the government and private sector groups on the other side. Additionally, the OMM Project became again more of an outsider in the oil palm landscape. From the beginning, there had never been an exit strategy for the closing of the MSP.

4.2. Effectiveness of the Multi-Stakeholder Platform

By analysing all data sources, we identified in total four communicated or suggested overall goals:

1. In the first interim MSP meeting in October 2016, the Regional Minister for Agriculture, Livestock, and Irrigation provided an idea of what the regional government would favour having. He stressed that having a spatial data platform is necessary to gain access to land-related data and numbers to tackle land issues.
2. In the December 2016 and March 2017 MSP meetings, the terms of reference of the MSP were presented (see Section 4.1.1). The points referred mainly to tasks such as supervising the OMM Project's mapping activities, collaborating with various stakeholders to help accessing data, contributing to collecting data, supervising the reporting, and so forth. These tasks could probably be summarised as supervising and assisting the OMM Project in doing a land use assessment.
3. The Regional Chief Minister communicated her ambition that the land conflicts around oil palm concessions should be addressed and resolved. She mentioned this towards the OMM Project as well as later in her opening speech of the August 2017 MSP meeting. However, she left it open how exactly this should be carried out and what the exact mandate of the MSP would be in this regard.
4. In the March 2017 and August 2017 MSP meetings, the OMM Project additionally presented its ideas of what the MSP could aim for over the months and years to come (see Section 4.1.1).

These communicated or suggested overall goals obviously differed, while also showing some overlap. This ambiguity of goals creates challenges in assessing the MSP's overall effectiveness. We therefore analysed what the MSP achieved and to what extent these achievements relate to the various communicated or suggested overall goals. Table 4 provides a combination of all four overall goals and respective achievements.

Table 4. Effectiveness of the MSP, interpreted by comparing the communicated overall goals and respective achievements.

Communicated Goal	How It Was Communicated	Achievements
(A) Land use assessment (via mapping, developing a spatial data platform, etc.)	Regional minister (1); terms of reference (2); ideas of OMM Project (4)	Several achievements under the supervision of the MSP (e.g., mapping several oil palm concessions with a multi-stakeholder participation, one extended report on a concession in Yebyu township, etc.). However, different stakeholders had different perceptions of what "land use assessment" should entail. The main achievements for this goal were completed after the MSP had fallen apart. [1]
(B) Addressing and resolving land conflicts and supporting land use planning for remaining land	Regional Chief Minister (3); ideas of OMM Project (4)	Achieved for very few local cases during the existence of the MSP. No direct impact of the MSP visible at the regional level. [2]
(C) Assessment of the quality of investments in the oil palm sector	Ideas of OMM Project (4)	No achievements during the existence of the MSP. [3]
(D) Developing sectoral policies and approaches to a sustainable oil palm industry	Ideas of OMM Project (4)	No achievements.

[1] The OMM Project completed this goal in 2020 even after the MSP had fallen apart. A detailed report was published by Hunt and Oswald in 2020 [42]. [2] The regional land use assessment completed by the OMM Project later on [42] potentially served as a basis for political and local case decisions made by the regional government. [3] The regional land use assessment completed by the OMM Project later on [42] includes a few elements of quality assessment, such as the status of the oil palm plantations.

During the time in which the MSP had been functional, only the first overall goal (A: the land use assessment) was partly achieved, as this was the first task of the MSP and OMM. For the other three goals (B–D), only very few achievements were visible during the existence of the MSP, if any at all. Moreover, many of the achievements from all goals (A–D) were only completed after the MSP had stopped functioning. They were completed by the OMM Project, who continued to collaborate with the stakeholders bilaterally instead of through the MSP. Accordingly, we conclude that the MSP as such was only partly effective if the land use assessment was to be the only goal, or even rather ineffective if all four goals would apply for the MSP.

The reasons why some goals were achieved while others were not are various. Regarding the content of the goals, it appears that goal A refers to a mainly technical task, for which the OMM Project brought the right competences as well as the mandate by the MSP to conduct the assessment. Goal C also implies a rather technical task, however includes competences, which the OMM Project did not have per se. Additionally, the MSP never gave a mandate to any stakeholder to conduct such an assessment. Goals B and D are highly political and very complex to address in the Myanmar context. This might explain why mainly goal A was partly achieved.

Looking at the necessary timeframe to achieve each goal, it seems that it would be possible to achieve goals A and C within a relatively short timeframe. Goals B and D seem to be goals which can only be achieved in the medium to long term. The MSP did not function long enough to effectively address medium- to long-term goals.

Last but not least, it is also possible that goals C and D were not addressed, as there was no or little intrinsic motivation by the Myanmar government to tackle these issues in the first place. Accordingly, there was also no mandate by authorities nor the MSP to address these topics.

5. Discussion

MSPs are perceived as being a promising means to contribute to solutions for land- and natural resources-related conflicts [19–22]. However, longstanding conflict histories and strong power imbalances may also limit the effectiveness of an MSP, in particular if the willingness and capability among the stakeholders to engage cooperatively and equally limits the potential to arrive at a shared problem-framing and definition of vision and goals [21,27]. This study investigated an MSP in Tanintharyi Region, southern Myanmar, which addressed land conflicts around oil palm concessions through a mapping approach. After a promising start and nearly one year with four MSP meetings, the MSP fell apart. The present study analysed the design, governance, and effectiveness of this MSP.

5.1. Promising and Hindering Factors for the Effectiveness of the Multi-Stakeholder Platform

5.1.1. Promising Factors

The set-up regarding the secured resources seemed promising, an integral part of designing an MSP [21,24]. The OMM Project committed to a long-term engagement with considerable financial and time funds, human resources, and equipment for the purpose of the MSP. Additionally, the OMM Project mobilised profound technical support regarding the mapping. The MSP also did not set any limits to the time horizon.

Another promising set-up was the given access to decision-making [21,57] through the chairmen of the MSP, the relevant regional government departments, as well as the Regional Chief Minister (the founder). Through these ministers and departments, the MSP was set-up to have access firstly to cross-sectoral and political regional-level decision-making, and secondly to national-level political decision-making. Unfortunately, the access to decision-making could not be effectively used (see below) despite the promising set-up.

The facilitation of the MSP was another promising factor, despite some weaknesses, too. An effective facilitation contributes critically to a constructive and non-violent communication and atmosphere in an MSP [21,24,55–58]. The senior facilitation expert—a member of the OMM Project—managed to bring the different groups (which were at conflict) into the same room for the first MSP meeting in October 2016. He also succeeded in creating a non-violent communication style among all participants and a constructive meeting atmosphere. Moreover, he tried his best at fostering the learning and willingness to support the MSP among the most influential stakeholders in the MSP.

Moreover, the purely technical lens on mapping oil palm concessions (instead of directly addressing land conflicts) appeared to be a promising factor at first. The mapping of oil palm concessions pulled the various groups into the MSP, each with different interests, even though they had been at conflict with each other for two to three decades. This technical lens allowed the MSP members to focus on technical steps while familiarising with each other. The MSP got quite far with this approach. At a later stage, the unique focus on technicalities of mapping was not solely constructive for the MSP anymore and hindered an effective continuation (see below). However, having a technical lens at the beginning allowed the MSP to be founded.

5.1.2. Hindering Factors

Besides several promising factors, various hindering factors were also identified. What MSP members criticised the most was the lack of a clear mandate, vision, goals, and decision-making competences of the MSP, which would be a key—and probably underestimated—criteria for an effective initialisation and continuation of an MSP [22,24,56]. Additionally, the lack of clearly defined roles and responsibilities of the participating groups was criticised. The authors of this study, who have accompanied and observed the MSP, confirm that the lack of these definitions led to frustrations and distrust in the MSP, especially on the CSO side and for the OMM Project. Scholars confirm that consensus among the MSP participants on such essential definitions (vision of the MSP, roles, responsibilities, etc.) is necessary to foster constructive relationships among the participants and to make the MSP effective [21,24,25,55–61]. Such a lack also hinders a shared problem and needs

framing, the finding of a joint language, methods and approaches of mapping, collective actions for systemic change in land conflict resolution, and much more. Later in the process, when the government (from the national to the township level) started taking serious actions in the oil palm sector without consulting the MSP, the lack of these definitions also made it impossible for the CSOs and the OMM Project to remind the government of the, for example, mandate and decision-making competences of the MSP.

Another major point of criticism was the lack of information and communication between the MSP meetings. Especially after August 2017, neither the OMM Project nor the regional government frequently and transparently informed the MSP members about news or delays due to occurring challenges. On the side of the OMM Project, this was partly due to the fact that the OMM Project was not allowed to contact the MSP members directly. On the government side, the reasons for the lack of information and communication are not confirmed. Based on our contextual knowledge, we assume that the government representatives were firstly overloaded with other tasks, and secondly also not used to inclusive multi-stakeholder processes and therefore may not have perceived a proactive communication to MSP members as necessary and useful.

Possibly connected to the previous point, the authors also observed a decreasing interest among some (but not all) of the government representatives to work inclusively in decision-making processes. Possibly, they did not see any or enough advantages of consultation and inclusion. Whether this lack of inclusion stemmed from limited willingness or from a lack of ability (for example due to time restraints, top-down orders, or a lack of experience), or a combination of it, is difficult to interpret. Regardless of the reasons, the consequence was a lack of effective access to and influence by the MSP on the decision-making processes at the regional government level and beyond. This, consequently, led to frustrations among various MSP members and distrust in the MSP. In relation to this, the increasing lack of effective leadership, which could have made the MSP thrive, also led to the MSP being rather ineffective and caused frustrations.

Finally, it was observed that some crucial expertise (or access thereof) was missing in the MSP process. The MSP was formed around the topic of mapping oil palm concessions. The OMM Project could provide sufficient expertise on mapping. Increasingly, however, it became evident that land governance and legal expertise would also be necessary to effectively address land conflicts. Moreover, the MSP process might also have benefitted from communication and conflict management support. The MSP, unfortunately, did not manage (and did not push) to gain access to such expertise during its existence.

Reflecting on the relevant stakeholders in land governance and land conflict resolution in Myanmar, the authors noted that there might have been an important connection to decision-makers missing in the MSP. The MSP was not formally connected to the regional-level "Land Reinvestigation Committee", a rather high-profile committee in charge of reinvestigating and resolving land conflicts [72]. This committee exists on national and each regional level, as well as on some lower administrative levels. The members of this land reinvestigation committee were also members of the MSP, however, there was never a formal connection, consultation, or collaboration between the committee and the MSP. Whether this was a hindering factor for the MSP to be effective remains unclarified. The authors, however, assume that such a collaboration could have been beneficial for both sides.

As the above description of the hindering factors illustrates, the MSP was not fully effectively designed and governed. Consequently, the MSP was not resilient to internal and external disturbances (such as plantation encroachments, political and jurisdictional actions in relation to oil palm concession by the regional government, data access limitations, etc.). The MSP was also never formally terminated. This uncertainty of continuance must have been confusing for the MSP members.

5.1.3. Limitations of the Study

Several limitations should be considered when interpreting the results of this study. First, our assessment of MSP effectiveness goes beyond the first communicated goal of conducting a "land use assessment" (see Table 4), as defined in the MSP's initial terms of references. It also includes the other communicated goals, which are more ambitious, such as conflict resolution, quality of investment assessment, and policy change (Table 4). Focusing on the narrower goal of a land use assessment from the terms of reference would have led us to a more positive assessment of achievements. Second, this accompanying research benefitted from certain access to MSP members due to close collaboration with the OMM Project. Nonetheless, access to the MSP members for researchers needed to be limited to facilitate the MSP process, even though greater access to MSP members would have enabled the authors to develop more in-depth understanding of the members' expectations, motivation, challenges, and frustrations. Having had such insights from MSP members might have enriched the results on promising and hindering factors of the MSP. Third, the literature for the analytical framework was searched and selected neither by a snowball sampling nor by any other very stringent procedure, but through the authors' personal assessment. Additionally, due to the feasibility of the study's extent, the literature stemmed from the fields of land governance and natural resource management only, not from other potentially relevant fields such as peace and conflict studies. It is thus possible that a more extensive literature review would have resulted in a slightly different analytical framework and results.

5.2. The (In)Ability of the Multi-Stakeholder Platform to Address Land Conflicts

In this section, we discuss whether an MSP is a suitable means for addressing land conflicts in a context of longstanding conflict histories and power imbalances, such as in the Myanmar oil palm landscape. We highlight that the circumstances for designing and governing an effective MSP were not very favourable in the investigated case. Firstly, the existing land governance structures and mechanisms (clarity on relevant stakeholders, decision-making competences and mechanisms, etc.) were not transparent and clear, and mostly unknown to all. Additionally, the laws and policies in place also often did not match perceptions of the reality of local land users. Local farmers and politicians, for instance, presumed that land could simply be revoked from unproductive companies and allocated to villagers. Such assumptions, however, proved to be wrong, as the example from Yebyu Township illustrated. Secondly, the power among the MSP participants was not evenly distributed. The main power was with the high-level government officials. Their interest in and support for the MSP seemed evident at the beginning, however, also appeared to decrease over time. The stakeholders who expressed the most requests towards the MSP were the CSO representatives. Their opinions and requests were heard but did not noticeably find their way into decisions or actions around land conflicts taken by the regional government. This shows that power imbalances regarding decision-making persisted even despite the MSP. Thirdly, for navigating an MSP in a context of longstanding conflict histories, the analysis proved that the stakeholder relations management was very important but also very delicate and challenging. This includes aspects such as tensions between stakeholders, trust, willingness to collaborate, and a clear definition of roles and responsibilities of the MSP participants. In this MSP case, tensions could be temporarily reduced and willingness to collaborate temporarily increased during the promising start of the MSP. However, the tensions emerged, and trust decreased again after some time due to various reasons. Fortunately, there was no further conflict escalation observed compared to the situation before the MSP had started, however, the MSP also did not contribute to reducing conflicts. Additionally, the roles and responsibilities of the MSP participants remained unclear from the beginning until the end. Besides the stakeholder relations management, the definition of a clear scope and mandate would have also been important for navigating the MSP securely in the context of resolving longstanding conflict histories. From the beginning to the end, there remained a lack of clarity on the overall

goal and decision-making competences of the MSP. Finally, the (in)ability of the MSP to address land conflicts must also be reflected against the Myanmar socio-cultural tradition. Myanmar's culture and tradition, and thus society, seems to be characterised by respect of and for seniority and authority, masculism, loyalty, and non-criticism, as was observed by the authors and their anonymous colleagues. Accordingly, even opponents of the oil palm concessions often adhered to respecting senior and high-ranking government officials and not publicly formulating strong criticism against them. Consequently, if MSP participants in Myanmar remain silent, it is difficult to tell whether they do so, for example, as a cultural code of codex, as an act of resistance, or as risk aversion. Vice versa, such a socio-cultural tradition of respect of and for seniority and authority and non-criticism can slow down MSPs or make MSPs a fictitious participatory process.

We thus conclude that, under the given circumstances, the MSP was an ambitious, delicate, and challenging endeavour. It remains unclear whether the MSP might have been able to contribute to resolving land conflicts if the design and governance of the MSP would have been different—or if it would have collapsed anyway at some point due to the difficult context. It appears, at least, that the MSP and all the mapping actions served to keep (or sometimes bring) the land issues related to oil palm concessions on the political agenda. This can be perceived as a positive side-effect of the MSP, bringing an improved law enforcement to Tanintharyi Region's oil palm sector. We doubt, however, that villagers benefitted greatly from improved law enforcement, as the laws and policies are usually favouring the economically and politically strong elite of Myanmar [7,12,29,30].

5.3. Novelty of the Study for Scientists and Practitioners

This study shows how challenging it is to design and govern an MSP on land conflicts related to oil palm concessions in Myanmar. It elaborated how the imbalance of power in combination with some weaknesses in the MSP design and governance undermined the ability of the MSP to co-govern decision-making processes around these land conflicts. The analysis and discussion of the promising as well as hindering factors in the design and governance of the MSP (Section 5.1) and the challenging context (Section 5.2) provided a reflection on the main strengths, weaknesses, and (in)abilities of the MSP to be effective.

The elaborated analytical framework on MSPs (see Table 2) is a further novelty of this study. It combines frameworks and recommendations on MSPs and social learning of various acknowledged authors from the fields of land governance and natural resource management on how to design and govern an effective MSP. Further, the recommendations presented in the conclusions (see Section 6) contribute to the novelty of the study. Based on the analysed case, these recommendations highlight the ten most important points on how to design and govern an effective MSP in such a challenging context of entrenched land conflicts and power imbalances. Therefore, this framework as well as the recommendations can also be used by practitioners and scientists to design, govern, analyse, or monitor an MSP in a similar setting. It goes without saying that the framework and the recommendations would need to be adapted to the prevailing case and context before application.

6. Conclusions

We conclude that using an MSP for addressing land conflicts in relation to large-scale land concessions such as in oil palm landscapes has many potentials, but also many risks. Especially if the land conflicts are entrenched and power imbalances strong, an MSP needs to be designed and governed very cautiously. A failure of an MSP in such a setting can further increase distrust among the stakeholders and either further entrench existing conflicts or even contribute to conflicts to (re-)escalate. If an MSP seems promising to contribute to land conflict resolution, then many aspects must be thoroughly considered. The framework developed in this study (Table 2 based on acknowledged literature) provides a useful starting point of how to design and govern an MSP to be effective under such complex circumstances. Thus, the framework should be useful for researchers and practitioners in the field, however, it needs to be further developed and adapted based on the respective

context and case. Ten specific points, however, need special attention when an MSP in a setting of entrenched land conflicts and strong power imbalances is considered, as presented in Table 5.

Table 5. Recommendations for designing and governing an effective multi-stakeholder platform (MSP) in a setting of entrenched land conflicts and power imbalances.

	List of Recommendations
1	The **representation of stakeholders** in the multi-stakeholder platform (MSP) needs to be carefully assessed (who will be included, who excluded). A participatory actor analysis (including power and conflict analysis) before defining the stakeholders is a key preparation.
2	The **mandate** including vision, intermediate goals, scope, time horizon, and decision-making competences of the MSP must be clearly defined from the very beginning. At the same time, the MSP should also define procedures for adapting these definitions, whenever adaptations appear necessary due to changing circumstances. It can be useful if the mandate in a first place is related to a technical solution (such as in our case providing accurate spatial data on land) instead of a purely political and controversial topic (such as in our case the land use conflicts per se). This might motivate the participants to collaborate despite existing tensions. However, at some point, the focus on the technical solution will not be sufficient anymore and the MSP needs to address the overall source and policy of the problem (e.g., land governance mechanisms).
3	An effective **leadership** of the MSP must be in place. The leader(s) must be motivated, available, and powerful and/or legitimate enough to make the MSP thrive. Additionally, the formally and informally **powerful stakeholders** inside and outside the MSP need to support—or at least approve—the MSP and its mandate, otherwise the MSP will be blocked. The willingness and ability of all these leaders and powerful stakeholders to learn and reflect needs special attention.
4	The **roles, responsibilities, and decision-making competences** of the participating groups (or even of each stakeholder, if useful) must be defined very early in the process. Additionally, for this point, the MSP should agree on a procedure for adaptations. Moreover, there should be someone responsible for and capable of effectively coordinating and driving the MSP forward, such as a secretary or focus person/group with the respective authority and legitimacy.
5	Secured time, financial, and human **resources** form the basis for an effective MSP.
6	If the envisioned mandate and outputs are related to decision-making (e.g., political or legal decisions on how to redistribute land after a war), the effective **access to decision-making** processes must be guaranteed.
7	A respectful and constructive **stakeholder management** is of utmost importance. All participants need to develop their trust in each other as well as in the MSP itself. During the MSP meetings, a conflict-, power-, and equality-sensitive facilitation is crucial.
8	A proactive and transparent **information and communication** approach is key to the above-mentioned points. The frequency and channels of information and communication can jointly be agreed on in the MSP.
9	Tangible intermediate **outputs and success** foster the continuance and effectiveness of the MSP, as they keep the participants motivated and increase their ownership.
10	Depending on the context and case, the MSP is in need of **various expertise** (e.g., in the form of advising). Certain expertise and support might be needed in each MSP, which addresses land conflicts, for example: facilitation, communication management, conflict management, land governance (mechanisms), legal basis, and coordination/operational management of the MSP.

The study also showed that further empirical insights on MSPs, which address land conflict resolution in settings of strong power imbalances, are needed, especially also in oil palm landscapes. Further research could strengthen the identification of success factors as well as risks and pitfalls for effective MSPs in such settings. Especially the analysis of successfully completed MSPs would be useful. Additionally, analysing impacts of failed and effective MSPs several years after the MSPs' completion could deliver further insights into the medium-term positive and negative impacts of an MSP on land conflict resolution. Moreover, if practitioners, decision-makers, and civil societies deemed it worth striving for a guide on effective MSPs in contexts of entrenched land conflicts and power imbalances, it would be crucial to join forces and—in a science–policy–practice collaboration—jointly elaborate such a guide, which should be adaptable to various contexts and cases.

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Conflicts of Interest: The first, second, and fourth authors worked at the Centre for Development and Environment (CDE), one of the implementing organisations of the OMM Project, in the timeframe of this study. Their role was to conduct critical accompanying research alongside the implementation of the MSP, developing and using the criteria for effective MSPs (Table 2 in the text). The third author joined the OMM Project and thus the CDE as a researcher and consultant after the implementation of the MSP. His role in this study was to critically reflect the effectiveness of the MSP together with the three other authors.

Appendix A. Design and Governance of the Multi-Stakeholder Platform

Table A1 provides a detailed presentation of the results per criteria along the analytical framework.

Table A1. Design and governance of the multi-stakeholder platform—detailed overview of results.

Criteria for Effective Multi-Stakeholder Platforms	Results
Set-up a multi-stakeholder platform (MSP)	
Management and representation of boundaries	
Adequate inclusion and exclusion of stakeholders (and those that they represent)	In the meeting on 8 October 2016, the nomination process was jointly defined. It was agreed on how many seats were reserved per group and how the groups should nominate their representatives. It was also decided that the two ethnic political organisations (EPO), which also claim territorial sovereignty for some or all Tanintharyi Region, were to be invited. After the October meeting, the nominations of representatives per group was completed and a formal launch of the MSP took place on 20 December 2016. The participants of the MSP were as follows: • Government group: Regional Minister of Agriculture, Livestock, and Irrigation as the chair of the MSP, Regional Minister for Natural Resources and Environmental Conservation as first vice-chair, Minister of Ethnic Affairs as second vice-chair, and six departments, each sending either their director or an assistant director. • Civil society organisations (CSO) group: six CSOs were nominated after the CSOs of Tanintharyi Region had jointly discussed who to delegate. • Companies group: The companies relied on an existing agreement they had among the oil palm companies, saying that two companies per administrative district would represent their group. Accordingly, in total, six companies were nominated to join the MSP. • EPO group: From the two invited organisations, only one agreed to join the MSP. There was no notice from the other EPO giving any reasons for their absence. • OMM Project: The OMM Project was present as the technical advisor regarding the mapping (including foreign experts). A senior Myanmar member of the OMM Project—a well-respected and well-connected senior expert in land politics and leader of Myanmar CSO—served as the facilitator of the MSP. The representative of the focal line department (national level) joined with the OMM Project team. Later in the process, some stakeholders strongly criticised the insufficient representation of internally displaced people (IDPs) and returning refugees, who found their villages and/or land taken by companies upon return. Other stakeholders, however, did not share this opinion and stressed that the CSOs were able to adequately represent IDPs and refugees. Other than this, there did not seem to be further complaints regarding inadequate inclusion or exclusion of stakeholders.
Communication and engagement strategy for the excluded stakeholders	To our knowledge, there was no communication or engagement strategy for those who were excluded from the MSP. At the beginning, it was once mentioned in the MSP that the representatives of each group would be responsible to communicate back and forth between the MSP and their networks. For example, the present CSOs would inform the non-present CSOs and other contacts from civil society about the discussions and decisions taken inside the MSP and, vice versa, inform the MSP about requests from their networks. Whether this informal communication and feedback mechanism was implemented and used remained unclear, but it seemed quite likely.
Matching constituencies and competences of the stakeholder representative (between her/his role in the MSP and in the represented organisation)	Whether the constituencies and competences of the stakeholder representative inside the MSP and in her/his organisation were matching differs depending on the group. The government departments and the CSOs delegated their leaders to the MSP, while the EPO and some of the companies sent lower-level representatives with limited decision-making competences to the MSP. Whether the representatives lobbied for or against the MSP efforts (or neither), once they were back in their organisations, is not known. However, among the government group (especially for the department heads and staff), there was the major challenge of frequent rotations. Accordingly, there were many changes of representatives within the government group. Additionally, the CSOs had to send delegates at times, as the meetings were organised at short notice. Thus, the constituencies and competences of the MSP representatives were partly adequate and partly inconsistent.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Linking stakeholders inside and outside the MSP across multiple scales and from different levels (for more effective collaboration and systemic change)	Through the set-up of regional-level as well as township-level committees and the participation of various stakeholder groups, the preconditions for this dimension might have been quite good. An effective collaboration across sectors, representation groups, and administrative levels for a systemic change in the palm oil sector might have become possible. However, as the MSP collapsed rather early, this point cannot be clearly assessed.
Initialisation and preparation of a MSP	
Situation and conflict analysis (stakeholders, institutions, power, politics, etc.), development of conflict sensitivity approach	Prior to establishing the MSP, the OMM Project made a situation analysis on the various stakeholders in Tanintharyi Region (including a conflict analysis). The conclusion from this analysis was that the context is not favourable for making an MSP. Nevertheless, the Regional Chief Minister and the OMM Project wanted to try it. There was no analysis of the land governance system created for Tanintharyi Region. There was also no conflict sensitivity approach developed for the endeavour. The OMM Project relied on the sensitive guidance by its senior Myanmar members, who were familiar with similar settings.
Clarity of reasons for establishing the MSP	When meeting the Regional Chief Minister bilaterally on 22 September 2016, she was quite clear vis-à-vis the OMM Project that her motivation was to tackle land issues related to oil palm concessions and that she would welcome any technical support. When holding the opening speech at the October (2016) meeting with the interim MSP participants, the Regional Minister for Agriculture, Livestock, and Irrigation also provided quite clear reasons for the establishment of the MSP, however already slightly more specific compared to the September discussions. He said (translated from Myanmar language): "*We are facing challenges for getting the complete information of basic land use, land cover, and land ownership. These challenges may be problematic for the transparency and accountability when it comes to land problems. Therefore, a spatial data platform is necessary to have access to land-related data and numbers.*" At the formal launch of the MSP in December 2016, however, there was no more mentioning of the overall goal or the reasons for establishing the MSP. Only during the August 2017 meeting did the Regional Chief Minister provide a speech about her motivation why the land issues related to oil palm concessions need to be tackled. Nevertheless, she did not elaborate on how this should be performed through mapping support. Later in the process, not yet during the initialisation, the OMM Project additionally presented its ideas of what the MSP could aim at (see below).
Establish interim steering body	In a governmental meeting in September 2016, government representatives and the OMM Project agreed on an interim steering body for the MSP, consistent of representatives from the government, civil society, private sector, and EPOs. This interim steering body met in October 2016 and decided on who to formally elect into the MSP. These elected representatives would then meet in December 2016 in the formal launch of the MSP. It turned out that the formally elected steering body was very similar to the interim steering body of the MSP.
Build stakeholder support for the MSP	The stakeholder support for creating the MSP was probably rather ambiguous among the groups and even within the groups. The MSP's creation seemed to be based on the enthusiasm of the Regional Chief Minister. The level of support by other government representatives could hardly be assessed due to the government protocol of being non-vocal in public. On the CSO side, the support for the MSP creation seemed quite high, or at least the CSOs were interested to see how it evolved. The companies, on the contrary, were mostly quite silent (but not opposing), thus, their level of support remained unidentifiable. The support from the side of the EPO seemed unclear, too, as they remained mostly silent. The level of support by stakeholders, which were not part of the MSP, is unknown to the authors. For all groups, it is unclear whether the representatives joined the MSP for reasons of wanting to contribute to a systemic change or for averting risks in case of non-participation. This might even differ for each individual and it might also be a combination of both.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Establish scope and mandate of the MSP, including decision-making competences of the MSP	The decision-making competences, roles, and responsibilities of the groups were not clearly defined at the beginning. It was made clear, however, that the three regional ministers held the leading position of the MSP. It was also communicated clearly that the OMM Project did not have any decision-making competences, but that it served only as technical advisor, enabler, and implementer of and for mapping activities (trainings, field surveys, mapping, etc., including covering all expenses). In the first formal MSP meeting in December 2016 as well as in the second meeting in March 2017, the terms of reference—comparable to a mandate of the MSP—were presented. There was a very short slot for questions and comments on the terms of reference, but no MSP participant raised concerns or questions. The terms of reference were as follows (translated from a slide, which was presented in Myanmar language during the meetings): 1. To guide and supervise the OMM Project's tasks for investigating the oil palm sector. 2. To collaborate with relevant government institutions and organisations to access data, maps, and other information. 3. To collect the relevant data and then analyse it. If needed, supervise the field surveys. 4. To supervise and guide a technical unit (OMM Project technical staff) so that the unit finishes the tasks according to the timeline for investigating the oil palm sector. 5. To supervise the reporting of progresses and work planning. In the March and August 2017 MSP meetings, the OMM Project additionally presented its ideas of what the MSP could aim for over the months and years to come. There were four major steps in the presented pathway. The first step was the land use assessment (using mapping techniques). The second step was titled as resolution of land disputes and land use planning for remaining land. In a third step, an assessment of the quality of investments in the oil palm sector was envisioned. In the final step, the pathway showed that the MSP could support to develop sectoral policies and approaches to a sustainable oil palm industry. This was, however, never discussed or approved formally.
Outline process and time horizon of the MSP	Apart from showing the terms of reference and the OMM Project's ideas on the way forward, there was no presentation or discussion on the entire process and time horizon of the MSP. Usually, the MSP agreed on the next steps at the end of each meeting.
Secured resources	
Sufficient financial funds	Almost all financial expenses for the MSP and the implementation of activities were covered by the OMM Project (such as travel expenses of MSP participants, in-kind contribution of the OMM Project for its staff, technical equipment for mapping, satellite images, etc.). At the beginning, it seemed that the OMM Project would have enough financial funds for the MSP and all mapping activities. Some MSP participants, however, developed high expectations and extensive requests regarding the mapping and its level of details after the first extensive field survey had been conducted in Yebyu Township. To fulfil these requests, there would not have been enough financial funds, nor enough human resources to complete the tasks within a meaningful timeframe.
Sufficient time	The time horizon of the MSP was not pre-defined. Given the envisaged overall duration of the OMM Project, the project could have accompanied the MSP for six or seven years. The bigger time-related challenge might have been the limited availability of the representatives given their partly high ranks and many engagements outside the MSP.
Sufficient and the right human resources	In terms of human resources, the picture is more ambiguous. As outlined above, some MSP participants did not have the adequate competences in their home-organisation (e.g., companies). For the technical mapping-related knowledge and skills, most MSP participants were also not fit from the beginning; however, this was also not a prerequisite. In terms of technical advice, the OMM Project brought the right human resources for the mapping. However, there seemed to be a lack of technical expertise on the legal system—as elaborated further below—and probably also on social cohesion and communication.
Sufficient and the right equipment	Most equipment for mapping (drones, GPS devices, licenses, satellite images, etc.) was provided by the OMM Project. From all types of resources, the equipment seemed to be the smallest challenge. The OMM Project could mobilise most of it.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Access to decision-making	
Access to wider (cross-sector) policy-making and governmental top-level decision-making processes	For the government group and for the OMM Project, it was understood—but not formally communicated to the other MSP participants—how the access to decision-making was conceptualised. The MSP was led by three regional ministers and supervised by the Regional Chief Minister. These four high-ranking officials were also members of the regional government cabinet, where political decisions for Tanintharyi Region were discussed. The MSP was supposed to serve as a consultation body for and advice provider to the ministers, who would in turn try to influence the regional government cabinet or even the government representatives from the national level. Moreover, the relevant regional-level governmental departments, such as Department of Agricultural Land Management and Statistics, Forest Department, or Department of Agriculture were represented in the MSP. Many decisions on mapping and permitting land concessions and investments were made within these departments, mostly at national and regional levels, a typicality of Myanmar's still centralised and hierarchical government structure. Thus, access to decision-making bodies was given with the structural organisation of the MSP. This, however, was not clearly communicated to the MSP until only August 2017. Despite the rather well-designed access to decision-making, the effective access to the government cabinet and relevant government departments still depended on the willingness and ability of the ministers and department heads to lobby for what was discussed in the MSP. There remained, however, another major challenge. Due to the legal pluralism, there were many different land zones, and for each zone, specific laws, policies, and responsible departments as well as various land-related committees existed. Thus, it remained rather opaque for most MSP participants which body (at which administrative level) to approach for certain decisions. Even most government staff did not understand the entire complexity of Myanmar's land governance system. Accordingly, access to decision-making was also—in some ways—not given due to the lack of transparency of and clarity on structures and mechanisms in the land governance system.
Run an MSP	
Adaptive (flexible) and effective management of the MSP	
Legitimate and effective management structures	The MSP was managed highly adaptively. The management, however, was also highly complex due to government protocols (of how to obtain meeting permissions, how to send meeting invitations, etc.). For organising one meeting, the focal line department at the national level first needed to ask permission from the Tanintharyi regional government through two parallel channels. Afterwards, the invitations to the MSP participants were sent again through the same channels. It was not allowed for the OMM Project to contact the participants directly. This permission and invitation process lasted between two to four weeks. Accordingly, the invitations usually arrived to the MSP participants at the last minute, which made it sometimes impossible for the delegated representatives to attend themselves. Thus, the management structures and coordination of meetings were legitimate in the given context, however noticeably not sufficiently effective or efficient.
Efficient and effective coordination of the meetings	
Legitimacy of decisions and processes	The decisions made in the MSP meetings were never a result of voting, a circumstance that can be typical in the Myanmar context. It was usually the facilitator (senior expert) who suggested a decision based on either bilateral discussions with members or based on discussions during the MSP meeting. When the facilitator suggested a decision, usually no one from the MSP made any major objections and his suggestions were silently taken cognizance of. In rare instances, the chairman announced a decision, which the government had already made before the MSP meeting, such as which township to start with the concession mapping. Thus, one could say that decisions and processes were legitimate as there were never any major objections during the meetings. However, it is also possible that MSP participants refrained from making comments due to lacking understanding on the discussion topic or due to feeling outside their comfort zone or field of responsibility. Further, it seems likely that power imbalances in the room, government protocol, and cultural codex of behaviour did not allow for MSP members to raise any major objections to either high-ranking government officials or the senior facilitator.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Adaptive capacity (flexibility) in planning and management	The action plans discussed during the MSP meetings were usually encompassing a timeline from the current meeting until the next meeting. Some steps were elaborated rather in detail, others were left quite open. Usually, the outlook on future actions had to be considerably revised after each meeting. It seemed as if the OMM Project and the MSP were on a very explorative path, as no such multi-stakeholder process had taken place before in this regional context and as the complexity of reality (around oil palm concessions and land governance more in general) was very high and almost unknown to most members.
Detailed but adaptive action plans	
Commonly agreed-on strategies for change	Despite—or due to—the highly dynamic and complex context, the MSP did not discuss or agree on strategies for change, success criteria, and indicators or monitoring mechanisms for observing progress.
Definition of success criteria and indicators	
Development and implementation of monitoring mechanisms	
Revision of progress, reflection on lessons learnt and feedbacks	During the August 2017 meeting, there was some reflection on lessons learnt and on feedback provided by the MSP participants from March 2017. Thanks to this reflection, the MSP group elaborated convincing plans for the months to follow (see above), which were unfortunately never realised due to its falling apart.
Constructive stakeholder and relations management	
Trust among the participants	At the very beginning of the MSP in October 2016 (the interim MSP meeting), trust was greatly lacking, especially on the CSO side, but probably also among the other groups. The CSOs strongly refused to enter the same room as the company representatives. Only thanks to an immediate conflict intervention and moderation in the hallway by the MSP facilitator did the CSOs finally hesitantly enter into the room, where the government and company representatives were waiting. After the meeting, however, the CSOs also seemed very committed to continue the collaboration, as it appeared to be a unique chance for tackling the entrenched land conflicts around oil palm concessions. This seemed to be a considerable progress given the decades-long conflict-affected history of Tanintharyi Region.
Understanding among the participants (including critical self-reflection, acknowledgement of problems and expectations of participants, overcoming prejudice, etc.)	The understanding among the participants also seemed to improve slightly thanks to some problem story-telling of all groups. However, none of the participants seemed to critically self-reflect or alter their own respective understandings very much.
Definition of roles, responsibilities, and decision-making competences of participants/the groups	Only in August 2017 were the decision-making competences of the MSP clearly communicated to the members, saying that they would be limited to formulating recommendations and requests to the regional government. They might have been clear to the government and the OMM Project, however most likely not to the other groups. With the exception of the OMM Project's role and responsibility as an outsider to Tanintharyi Region, the roles and responsibilities of all other groups have also never been specifically discussed. The CSOs repetitively pointed out this deficit, however the MSP did not react to it. The lacking definition of roles, responsibilities, and decision-making competences led to an increasing frustration on the side of CSOs and the OMM Project.
Consensus among participants (vision, expectations, rules of the game, etc.)	Similar to the fact that decisions were rather silently taken cognizance of, consensus among the participants (on processes, rules of the game, vision of the MSP, etc.) was also not explicitly fostered. The facilitator repetitively stressed that the mutual communication should be respectful to be successful as an MSP, and everyone seemed to agree. The focus of consensus-finding was usually on the next steps. Other than this, there was no explicit discussion on expectations, vision, processes, structures, etc. Maybe this was left open on purpose, given the possibility that a joint problem-framing and consensus-finding on overall goals might have been challenging in this fragile MSP setting.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Strong stakeholder ownership and commitment, collaborative leadership	The ownership and commitment among the stakeholders differed among the groups and even within the groups and rather depended on the individual representatives. The ownership and commitment of the government group seemed quite high at the beginning, however, the willingness to consult the MSP decreased drastically with rising challenges. The government group was by no means homogeneous. The ownership, commitment, and the leadership seemed to heavily depend on the individuals joining the MSP meeting, which changed often due to the many engagements of the government staff and the frequent position rotations. Nevertheless, it was observable that out of the three most relevant government departments, two were rather responsive and constructive, while one was noticeably passive or even slowed down the process outside the MSP meetings, a behaviour that can be understood in the Myanmar context as a sign of non-interest, uncertainty, or even opposition. On the CSO side, ownership and commitment seemed quite high at some points in time (visible through punctually lots of feedback, requests, and questions, sending their leaders to the meetings, etc.). At the same time, the CSOs sometimes appeared to be at the brink of quitting their membership in the MSP. After the challenges had begun in December 2017 and the MSP did not get the chance to meet again, the CSOs repetitively threatened to officially leave the MSP in case the MSP's role in the entire oil palm concession politics would not be clarified and formalised. The companies, on the contrary, were mostly quite silent (but not opposing). Some of the companies did not send their top leaders, but lower-level representatives with less decision-making competences, and thus, most likely also less discussion-making competences. While few company representatives openly communicated their interest and support in resolving land conflicts, as conflicts are hindering for business, others never uttered any statements. Thus, the ownership and commitment among the companies might have been rather diverse. Noteworthy, most companies cooperated extensively on site, whenever mapping activities took place on their concession areas. The ownership and commitment from the side of the EPO seemed unclear from beginning to end. They never sent high-ranking delegates, nor did they participate in discussions.
Equity and inclusiveness	There were many efforts by the facilitator of being inclusive and treating everyone equally. Only the companies were sometimes (maybe unconsciously) neglected in welcoming speeches or excluded in discussions. The companies, for their part, were often very silent.
Dealing with influential stakeholders inside the MSP	The facilitator had a very good systemic understanding and feeling for detecting the influential stakeholders. He was also familiar with the complex hierarchies inside the government. As well as acknowledging the formal power structures, he also considered the informally influential individuals. He respected the power setting and dealt with the influential stakeholders by proactively providing them space for talking, asking them specific questions (most likely to foster their learning effect, increasing their willingness to collaborate, and/or to test the feasibility of an idea), or by making sure they had good seats.
Effective conflict management	Except for the vocal conflict incident in October 2016 in the hallway, there was no incident of a conflict noticeably escalating during an MSP meeting. There were most likely several tensions occurring. The setting, however, was too formal for conflict escalation. Accordingly, the facilitator needed sensitivity for detecting tensions or dissatisfaction. Whenever he sensed such a situation and the concerned participants were rather influential, he approached the participant(s) during a break or after a meeting to pacify the emotions. Later, when there were no MSP meetings taking place anymore, tensions on the CSO side towards the OMM Project rose. As described above, the CSOs requested a clear definition of the MSP's role in the politics regarding oil palm concessions. This conflict was never resolved. Due to the limited effectiveness of the MSP, the OMM Project also faced internal disagreements on the way forward, which it did not manage to resolve timely.
Joint activities of the participants	Apart from lunches and tea breaks, where most groups sat among themselves, there were no joint activities of the MSP members. There were also no other social activities during the MSP meetings. At the township level, however, there were joint trainings for the committee members (drone operation trainings, etc.) and field surveys. These activities helped a lot to overcome barriers of communication and maybe even prejudice within the committee. Even though the focal unit of this study is not at the township level, this illustrates that joint social activities can indeed have a positive impact on the atmosphere among the MSP participants. However, probably, the setting at the regional level was too formal and the conflict histories between the stakeholders too entrenched.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Effective communication and facilitation	
Constructive facilitation during MSP meetings, including powerful questions of the facilitator(s)	The facilitation of this MSP was of considerable importance. The interim MSP meeting in October 2016 proved that a facilitator was needed, who knew how to bring groups to one table, which had been in conflict for several decades. The facilitator of this MSP was a senior and well-connected land and facilitation expert. He was used to even higher-level and politically sensitive land-related MSPs. Most likely, it was only thanks to him that this MSP survived the first get-together in October 2016, which was the most critical. In all meetings to follow, the facilitator usually sensed the expressed but also the unexpressed feelings in the room. Noticeable, however, he paid special attention and politeness to the more influential persons in the room, less so to the less relevant stakeholders. In an interview, he confirmed that he would especially focus on the positive learning of the more influential persons (see also above), as he believed that the MSP would only make progress if the most influential supported it. The facilitator also very strategically led the discussions by providing summaries of speeches, asking powerful questions in a certain direction, highlighting the main points of the meeting from his perspective, or by presenting suggestions of how the MSP could decide on an issue. It remained unclear whether he did this strategic steering of discussions for influencing the outcome of the MSP meetings or for efficiently moving on during a meeting with many agenda points (or other reasons).
Active (and if possible, equal) participation in communication of all participants	Noticeably often, the chairmen and the facilitator motivated all participants to be active, open, and polite in their communication and invited everyone to equally participate. In the first formal MSP meeting in December 2016, the CSO, companies, and EPO groups were conspicuously quiet. It was later found out that the CSO representatives did not yet dare to speak in this setting, as they had no experience with multi-stakeholder meetings of this dimension and composition. In the later MSP meetings, the CSOs were much more active in communication and seemed well-prepared. The companies and the EPO groups continued to be rather quiet in the formal format. Additionally, the chairmen were conspicuously quiet. The facilitator invited them several times to express their standpoint on certain topics to get a feeling for their priorities and for the feasibility of ideas.
More dialogue, less debate	The discussions were usually held neither in a dialogue format nor as debates. Mostly, the communication was limited to either presentations or question-and-answer slots after a presentation. As noted, the setting was probably too formal and the meetings too short (usually two to three hours) to let dialogue develop. Only during the second day of the August 2017 meeting, when group works were held, did dialogues happen. Most likely, this was due to the much more informal sitting order, with only chairs in a small circle and without the chairmen being present, instead of the normal sitting order as can be found in formal state meetings (where tables form a U-shape, and each participant has a microphone on the table).
Non-violent communication	Even though the different groups experienced decades of entrenched land conflicts and war, at most times, the communication in the MSP meetings was non-violent, with rare incidents of indirect shaming and blaming.
Active listening of all participants	It also seemed that most MSP participants listened actively whenever someone spoke. The active listening was noticeably the case for the CSOs, the companies, and the OMM Project. This could be noted due to the high responsiveness of the CSOs and the OMM Project and the active note-taking of the company representatives. Within the government group, the degree of active listening seemed diverse and seemed to depend on the individual. On the EPO side, it is hard to tell how actively the representatives were listening.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Joint language and communication style	In terms of joint language and communication style, the most noticeable difference was between the stakeholders with mapping experience (OMM Project and some government representatives) and the rest of the MSP participants. This was evident in most MSP meetings, as concession mapping was the component which pulled everyone into the MSP, even though the interests behind the mapping were different among the MSP participants. While the stakeholders with mapping experience used many more technical terms in their language and tried to focus on solving technical mapping issues (e.g., which reference system to use in GIS, whether to work with satellite images or drones), the other participants focused on their more context-related problems and interests. The CSOs, for example, wanted to integrate the old village locations in the maps to prove where the refugees originally came from. The companies requested that also unplanted land should be included in the concession maps, if it was left unplanted on purpose such as for water catchment, milling, housing, protection against soil erosion on steep slopes, etc. As there were almost no dialogues happening (see above) and the MSP only existed for less than a year, the MSP never reached a joint language. This might be rooted in the problem that the MSP did not have a joint problem-framing and vision, and/or that the MSP members did not know or express what data they needed to support different kinds of decision-making processes. Accordingly, the presentation of technical mapping results was probably disconnected from the needs or interests of the MSP members.
Timely and transparent communication to everyone (during and between meetings)	Timely and transparent communication to everyone seemed to be a major challenge, especially between the meetings—less so during the meetings. At almost each MSP meeting, some participants complained about late invitations (see above) and the lack of sharing meeting minutes with everyone. Especially after the last MSP meeting in August 2017, there was a major lack of communication among the MSP participants. Additionally, the OMM Project failed in informing timely and transparently about the steps it undertook in the meantime. It is assumed that this omission was due to two reasons. Firstly, it was not allowed for the OMM Project to communicate directly with the MSP participants. All communication had to go through governmental channels (see above). Secondly, the OMM Project faced several challenges itself (internal disagreements, lack of access to government data, etc., see above) and felt uncomfortable to inform MSP participants about their challenges. The OMM Project decided to wait with communication and a next MSP meeting invitation until there was visible progress on the concession mapping activities. Besides the OMM Project, also the regional government did not communicate timely and transparently with the MSP. As outlined in Section 2.3, the regional government undertook some serious actions against oil palm concessions without consulting or informing the MSP. This lack of communication was looked on with disquiet or even resentment by some MSP groups.
Effective and transparent communication with non-participants and the public	Whether the communication with non-MSP participants and the public was effective and transparent is impossible to tell. It is assumed that each MSP group communicated through their own channels to spread information from the MSP meetings or to bring feedback back into the MSP. It is certain that there were no official communiqués of the MSP, which would have been shared with, e.g., media or other stakeholders.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Culture of reflecting and learning	
Provision of time for learning and reflecting	Apart from the August 2017 meeting, there was not much conscious reflecting and learning, as time was always short and the setting formal. The second day of the August 2017 meeting was dedicated to group work, including reflecting on lessons learnt and the way forward. As it seemed, this was a successful exercise with promising outputs for the continuance of the MSP (see Section 2.3). Unfortunately, this was the last time the MSP came together. The OMM Project also needed to learn and reflect. However, the persisting internal disagreements on the way forward proved that this internal learning and self-reflection process unfortunately did not take place sufficiently or probably not with the most useful methods.
Use of supportive methods and approaches	
Effective collective reflecting and learning (on successes and failures, (dis)agreements, equality, norms, values, relationships, individual social-emotional competences, etc.)	
Technical support (expertise) to the MSP	
Sufficient and the right technical advice/support	From the beginning, it was clear that the MSP would need technical support regarding mapping (besides other expertise). The OMM Project could provide the right and sufficient technical support in this regard. After the first extensive field survey of an oil palm concession in Yebyu Township, however, it became evident that the MSP was also in need of legal advice regarding land conflict resolution and rightful land use and ownership. Questions such as what to do with overgrown and neglected plantations, how many plants per acre (Myanmar unit of measurement of space) needed to be planted by the company to fulfil the contract, what to do in case of forced displacements or war-related fleeing of entire villages, etc., needed clarification by experts. Additionally, there was a need for expert support regarding understanding the land governance system of Myanmar. It was unclear what would happen to the revoked land, which department or which committee at which level would have the decision-making competences to resolve disputes, etc. The MSP members themselves stated that they lacked the understanding of these complex and—to some extent—nontransparent land governance mechanisms. The lack of such expert support was clearly identified by everyone in the August 2017 meeting. Afterwards, the OMM Project tried to mobilise respective technical support, however without much effect. It seemed difficult to find such experts, and the MSP did not meet anymore afterwards. It is also possible that the OMM Project could have benefitted from an expert in communication, facilitation, and conflict management from the field of peace- and state-building to advise the OMM Project on its challenging role and internal learning.
Collective action for systemic change	
Willingness to change	The Regional Chief Minister seemed overly enthusiastic to resolve land issues related to oil palm concessions. Similar were some individual statements of other government representatives (but not all). Additionally, the CSOs were willing to contribute to this systemic change. The companies stated that they also suffered from unclear legal conditions, unclear concession boundaries, and land use conflicts with villagers. During the field surveys, the companies mostly appeared collaborative and supportive. These statements and observations indicate interest of—at least several if not of all—companies to address these land issues. The perceptions of how exactly the addressing of land issues should be carried out remained presumably different among the groups, even though it was not explicitly discussed. From the EPO's side, little is known for this point.
Embrace complexity and a change of the system	The complexity of the system and the change thereof was a major issue. The OMM Project (including the facilitator) often reminded the MSP members of the complexity of mapping and that mapping is not free from being political and therefore needs to be performed cautiously. The OMM Project also highlighted that "giving land back" to the local people is not as simple as it might seem, and that it can easily lead to new conflicts if not carried out in a well-considered way. It might also have appeared disillusioning to some MSP members that the land governance system was highly complex, favouring mostly the elite, and could not be changed within a short time.

Table A1. *Cont.*

Criteria for Effective Multi-Stakeholder Platforms	Results
Development of skills and capacities for action	Due to this complexity, the unclear mandate, problem-framing, and goal of the MSP, the early falling apart of the MSP, and probably also the lack of technical support in the legal domain, there was not sufficient development of skills and capacities for all MSP members.
Collaborative action outside the MSP meetings, including identification of actions, responsibilities for actions, and management of successful implementation	The regional and national government continued taking serious actions on land governance in the oil palm sector (see Section 2.3). The governmental stakeholders highlighted that the support by the OMM Project (for the MSP) was very useful to them, as it enabled them to access maps and better understand the challenges around the concessions in general. Hence, there were some actions indirectly resulting from the MSP, which had a strong impact on the system (e.g., revoking of permits). These actions, though, were not collectively taken within the MSP as originally intended and they also did not transform institutions as much as was probably hoped for by the CSOs or the OMM Project.
Transformation of institutions	
Close an MSP	
Closure of an MSP	
Development and adaptation of an exit strategy (e.g., how a continuation after the MSP, after external support, or after the facilitation, etc., would look)	There was no exit strategy in place.
Revision of the MSP process and draw lessons learnt (e.g., expectations, goals, outcomes, strengths, weaknesses, success, failure, monitoring)	As the MSP was never formally closed, there was also no opportunity for a joint reflection on or review of the goals, outputs, and outcomes, nor a reflection on expectations of MSP members and non-members.
Official closure of the MSP (e.g., closing event, final reporting, final communication to the public)	There was neither a closing event nor a final reporting or communication to the MSP members or the public.

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Declaration of consent

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Declaration of consent

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