PhD Dissertation

Title

Knowledge as Leverage of Land Governance Transformation The case of palm oil plantation

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Executive Summary

There are relationships between path dependence, decision-making, and governance directions. Vested interest groups or powerful actors often influence the decision-making process. These influences can result in path-dependent governance directions. Land governance change can provide opportunities for better governance practices. This dissertation examines how knowledge affects and changes land governance. It combines social-ecological and socio-technical perspectives and leverage points for system transformation.

Chapter 1 touches upon the need to understand path-breaking opportunities in land governance. Previous literature suggests analyzing several aspects to understand path-breaking opportunities. These aspects are transformative actors, strategic agencies, and knowledge. The guiding research question is: "How does knowledge interact with and influence the transformation of land governance?" This dissertation separates this research question into three parts. The first focus is the influence of knowledge origins on the transformation process. Second, the land governance transformation itself. Third, the influence of interventions on the governance trajectory.

Chapter 2 provides insights from the prominent theories to analyze path-breaking opportunities. These theories are socio-ecological (SES), socio-technical (STS), and leverage points for sustainable transformations. SES looks at the interconnection between social and ecological components shaping governance outcomes. STS complements SES in analyzing structural elements to identify path-breaking opportunities. These structural elements are stakeholder interactions, institutional arrangements, and system behaviors. Leverage points for sustainable transformations allow the analysis of possible intervention points. These intervention points are useful for purposeful governance destabilization.

Chapter 3 explores the relationship between knowledge, actors, and governance transformation processes. The guiding question for this chapter is: "How does the origin of knowledge affect the transformation process?" It analyzes the creation of the ISPO policy as a case study. It uses knowledge co-production as an analytical lens. This chapter observes two efforts

in the creation of the ISPO policy. Further, there are changes in knowledge co-production principles between the two efforts. The goal, interaction, and context of ISPO policy creation differ between the first and second efforts. There is a relation between knowledge origins and co-production principles. The involvement of NGOs influences the origins of knowledge and changes the principles of co-production.

Chapter 4 explores the transformation of land governance and the influence of interventions through a systematic literature review. It uses two guiding research questions. The first is "How does the land governance system transform?" Second, "'How do leverage points, specifically knowledge, influence the land governance transformation trajectory?" This chapter shows that there are sequences in land governance transformation. The land governance transformation starts with triggers. Triggers create path-breaking opportunities. Strategic actors exercise strategic agencies to capitalize on path-breaking opportunities. Strategic agencies intervene through leverage points. However, this chapter observes few instances of knowledge to intervene or capitalize on path-breaking opportunities.

Chapter 5 discusses how to influence land governance transformation based on the results of Chapters 3 and 4. This chapter asserts four interrelated aspects in analyzing land governance transformation. These interrelated aspects are "when" (triggers), "who" (actors), "where" (leverage points), and "how" (actors' actions). Chapter 6 concludes the dissertation by answering the main and three-part research questions.

First, this dissertation has shown that land governance transforms when crises occur. Consequently, crises create path-breaking opportunities. Second, this dissertation has demonstrated that leverage points influence governance trajectory. How leverage points influence trajectory depends on the actors' strategic actions. Third, this dissertation has shown that the origins of knowledge affect the transformation trajectory.

This dissertation provides an academic contribution by identifying four key elements in land governance transformation. First, crises create opportunities. Second, opportunities need strategic actors to capitalize on them. Third, strategic actors need to exercise strategic actions. Fourth, strategic actions intervene through leverage points. The empirical limitations of this dissertation make it difficult to elaborate on how land governance transforms and risks reducing the validity of the case study. A robust case study could provide more insight into the co-production processes.

Keywords: Land governance; Governance transformation; Transformation trajectory; Leverage for transformation; Knowledge co-production

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Chapter 1

Introduction

1.1 Background: Breaking Path Dependency in Land Governance System

Land governance is multifaceted and faces systemic challenges due to the intersections of complex aspects, including assessing and implementing sustainable land policies, building a strong interaction between people and land, and managing various interests. In understanding how access to land is governed, Azadi (2020) found that the challenges in land governance encompass the gap in understanding land policies in practice and on-field phenomenon due to the majority of historical practice and land-related issues being considered separately. Land governance is also required to recognize and enforce property rights, eradicate extreme poverty and hunger, promote equality and female empowerment, and ensure environmental sustainability.

Land governance as a system is complex and ever-changing and deals with the intersection of policies, processes, and institutions on access, use, and interest in land and resources (Azadi, 2020; Palmer et al., 2009). Within this system, diverse stakeholders, including ministries, local authorities, utilities, and civil society groups, each with distinct perspectives and objectives, negotiate their competing interests in the management and utilization of land (Enemark, 2012). As a system, the interplay of competing interests among users, the availability of resources, how users utilize those resources, and how governance structures regulate resource use leads to outcomes that affect the resources themselves, the users, and the governance structure (Goldstein et al., 2023; Wittman and James, 2022). Competing interests often drive changes in land governance, particularly when multiple institutions, sometimes with conflicting goals, interact and shape governance practices (Tchatchoua-Djomo, 2018). These dynamics can also be viewed as a shared

mechanism between multiple actors, affecting the users, landowners, and the available land resources (Ostrom, 2009). Effective land governance systems are essential for ensuring sustainable and equitable use of land resources, as well as for the planning and management of infrastructure development.

In a governance system with diverse stakeholders and competing interests, the dominance of particular interest groups or actors has led to institutionalized path dependency, with historical decisions and events continuing to shape the governing direction (Lee et al., 2019; Biitir and Nara, 2016; Javid, 2011). This path dependency can equate to unsustainable control of land, shaping livelihoods and people's well-being (Doyon et al., 2021; Goldstein et al., 2023; Wittman and James, 2022), and limiting the potential for change toward sustainable practices (Zhang and Ye, 2021; Djelic and Quack, 2007).

Land governance functions to manage and administer land uses and access to land, involving various processes such as decision-making, conflict of interest, institutional arrangements, and power relations (Borras and Franco, 2012; Sikor et al., 2013). A systemic transformation is required to overcome path dependency (Djelic and Quack, 2007; Smith et al., 2005; Geels and Schot, 2007), especially in a system where the dynamics of competing interests and the consequences of policy action are linked to path dependencies and lock-ins (Goldstein et al., 2023).

Previous literature notes that socio-technical transitions (STS), socio-ecological transformations (SES), and leverage points are frequently used approaches among popular theories to understand an ongoing process of transformation (Salomaa and Juhola, 2020; Feola, 2015). From the STS literature, a system transformation is determined by the availability of resources in the regime to withstand structural instability and the agency of actors outside the regime network (i.e., resource, power, and network) (Frantzeskaki et al., 2012; Smith et al., 2005). From the SES literature, a system transformation can be broken down into four phases in a cycle: exploitation, conservation, release, and reorganization (Westley et al., 2013). A transformative agency is critical in enabling transformation that initiates creative destruction and experimentation (i.e., release and reorganization). From the leverage points literature, a transformation will likely happen when intervention is targeted at the system's structural rules or goals rather than targets or incentives produced by policy interventions (Abson et al., 2017).

Actors' transformative agency, such as sensemaking, innovation, or policy entrepreneurs, plays a crucial role in shaping governance processes and outcomes (Westley et al., 2013). These agencies are closely linked to their aims, which are relevant to their goals, interests, values, and motivations. These aims may include economic, social, and environmental objectives (Andriami-

haja et al., 2021). Previous research suggests that transformative actions, aimed at influencing actors and empowering potential agents of change, may be necessary to initiate sustainability transformations. For instance, consider bringing together a cash crop collector (with an economic aim) and a conservation agency (with an environmental aim) to align their agendas, incentivized through a transfer of funds (Andriamihaja et al., 2021). Additionally, workshops conducted by former local government officials (with a social aim) have helped certain local institutions (with environmental or social aims) regain legitimacy by providing time-series information on land use changes and patterns (Novotny et al., 2021).

The literature about transformation, especially from SES and STS, provided insights into causality in land governance change (Olsson et al., 2006; Geels, 2006; Olsson et al., 2004). In SES, sustainable transformation, and transition studies, a transformation from path dependency is possible when shocks occur (Herrfahrdt-Pähle et al., 2020; Geels et al., 2017). Triggers and opportunities explain the timing, while leverages are relevant to 'specific structures' in explaining changes (Fischer and Riechers, 2019; Moore et al., 2014). The shock sometimes influences human actors or disturbs the governance mechanism, creating windows of opportunity for change (Goldstein et al., 2023; Geels et al., 2017; Sutherland et al., 2014). Deliberate human agency enables these changes (Westley et al., 2013; Ostrom, 2009; Walker et al., 2004).

1.2 Achievements and remaining challenges of land system research

1.2.1 Systemic perspective in land system literature

The concept of structural transformation in land system literature has been explored extensively. The structural transformation in land system literature understood the exogenous and endogenous feedback mechanisms influencing land use (Lambin and Meyfroidt, 2010). Further, the land system literature analyzed historical cases and empirically observed regime shifts (Ramankutty and Coomes, 2016). Studies were emerging to understand regime shift through a system dynamics perspective focusing on land use dynamics. In addition to understanding that land use regime dynamics are complex, it has been established that land use is also path-dependent (Seto et al., 2016), influenced by distant drivers (Lambin and Meyfroidt, 2011), and contested and influenced by societal power relations and asymmetries (Li, 2014; Scheffer et al., 2017).

The above research provides insights into how path dependence also happens in land governance. While there is no explicit explanation for land governance, path dependence occurs across disciplines, including land use policy and environmental governance (Goldstein et al., 2023). Further, while not specifically aiming to provide a path-breaking trajectory, systemic change in land governance has been researched extensively. The concept of regime shifts in land governance-related research was initially recognized by analyzing the change in land use regime (Ramankutty and Coomes, 2016; Meyfroidt, 2016). Studies were emerging to understand regime shifts through system dynamics perspectives focusing on land use dynamics. In addition to understanding that land use regime dynamics are complex, it has been established that land use is also path-dependent (Seto et al., 2016), influenced by distant drivers (Lambin and Meyfroidt, 2011), and contested and influenced by societal power relations and asymmetries (Li, 2014; Scheffer et al., 2017).

The research on land use system change proposed priorities for research, one of which is to develop an improved theoretical framework for understanding regime shifts. Conceptual models of transformation or regime shift overlap in studies of societal transformation in response to environmental change (Feola, 2015). As mentioned above, the popular conceptual perspectives for understanding system transformation are socio-technical transitions (STS) and socio-ecological transformations (SES). Previous research in land use regime change also proposed to use these perspectives to understand the system dynamics in land use research.

1.2.2 Progress and Remaining Challenges in Land Governance Research

Other than the systemic perspective of land use system change, the land governance literature has progressed to prioritize sustainable transformations through stakeholder engagement and the concept of land governance, moving beyond mere observation of change to designing sustainable solutions and providing some insights on how to achieve better governance (Verburg et al., 2015). For example, polycentric governance in telecoupled resource systems is emphasized as a means to design sustainable transformations through stakeholder engagement and the concept of land governance (Dressler et al., 2017). Understanding the impacts of land tenure structural arrangements on the adaptive capacity of marginalized groups in Ghana underscores the critical role of governance structures in promoting resilience and sustainability (Guerrero et al., 2015). Moreover, the dynamics of post-crisis spatial planning in England and the Netherlands highlight the need for adaptive gov-

ernance mechanisms to navigate socioeconomic regime transitions (Verburg et al., 2013).

Previous research has demonstrated that activities influencing land-based decisions and practices, such as agriculture, reflect land governance's complexity and multifaceted nature. Gender and generation perspectives in engagements with oil palm in Indonesia have illuminated the social complexities and power dynamics inherent in land governance processes (Vogt et al., 2015). Similarly, resistance to agrarian extractivist projects in Guatemala has underscored the social struggles and environmental conflicts arising from large-scale agricultural expansions (Oberlack et al., 2018). Despite recognizing these complexities and multifaceted issues, there has been limited attention to monitoring land governance (Azadi, 2020). This lack of focus persists even though governance frameworks can significantly shape sustainable land management practices influenced by policies and socioeconomic factors, such as the oil palm boom (Hopkins, 2017).

There are limited reviews on systemic perspectives on land governance. However, the previous research on land governance provided additional insight into the possibility that complex interdependency occurs in land use and governance. Similarly, Azadi (Azadi, 2020) argued that limited attention has been paid to the research that analyzes the systemic change in land governance. Through their framework, they propose a linear intervention through strong/weak governance concepts. However, their approach lags behind the land use system change literature, especially in understanding the non-linearity and uncertainties of complex environmental governance such as land systems (Meyfroidt et al., 2022; Underdal, 2010). Specific challenges, such as how the governance system fosters the desired pathway while weakening the forces that resist change (Martin et al., 2020) or how new institutional arrangements prevent undesired lock-ins that limit governance trajectories (Unruh and Carrillo-Hermosilla, 2006) were also kept unanswered. In addition, while some characteristics of land use regime dynamics have been established, it is unknown whether those characteristics also apply to land governance regime dynamics, especially considering land governance covers the decision-making aspect for use, access, and interest (Palmer et al., 2009).

1.2.3 Research of path-dependence and path-breaking in land systems research

To understand the systemic change in land governance and answer the remaining challenge raised in the previous literature, there is a need to embed the elements of "radical, systemic shifts in deeply held values and be-

liefs, patterns of social behavior, and multi-level governance and management regimes" that are prevalent in other transformative governance research (Chaffin et al., 2016). Other complex systems, such as energy, urban systems, and agriculture, for example, have explored the possibility of path-breaking trajectories by utilizing the elements of socio-technical systems. For example, the path-breaking trajectory for the EU electricity system can be introduced exogenously or endogenously (Apajalahti and Kungl, 2022). Changing regime structure, political intervention, or introducing a new actor with different backgrounds and mindsets are exogenous ways to introduce path-breaking trajectories. The change in perspective and explorative learning of the incumbent actors are endogenous ways to introduce path-breaking trajectories. The similar endogenous, explorative learning by incumbent actors, dubbed 'authoritarian entrepreneurialism,' is also observed as the path-breaking trajectory of the urban system in Istanbul (Özman et al., 2023). The study of cotton agriculture in India provided some empirical evidence of the shift of regime structure due to external political and economic shocks driving the adoption of higher cotton yield and agricultural labor costs (Stone and Flachs, 2018).

One of the challenges raised by the recent literature review on land use regime shift and path dependence literature is to understand path-breaking trajectories in more specific sectors such as land use or governance (Ramankutty and Coomes, 2016; Meyfroidt et al., 2022; Goldstein et al., 2023). The land system literature suggested approaching the shift from the perspective of SES or adopting the idea from STS (Ramankutty and Coomes, 2016). The SES perspective allows an understanding of the governance of system dynamics, while ideas from the STS perspective provide an understanding of trajectories and evolutionary dynamics of social innovation. These perspectives help in discussing and analyzing the issues of complex causal pathways, such as temporality and path dependence (Meyfroidt, 2016).

Considering the limited research on path-breaking trajectories in land use or governance systems despite the advancement in the use of systemic perspective in land system research, this dissertation tries to answer the call to improve the existing analytical framework to analyze path-breaking opportunities, path-breaking trajectories, and interventions for transforming land governance system. Ideally, this framework can identify how governance transformation happens, when the transformation is happening, what kind of intervention is important, and who should intervene. In addition, this framework should consider the interconnected nature of social-ecological systems, accommodating intricate relationships between social, technical, and ecological elements, and the necessity for integrated perspectives to address contemporary challenges effectively.

1.3 Research question and the structure of the dissertation

Recent advancements in institutional analysis and land system literature provide complementary perspectives on land use change, governance, and sustainability, indicating the requirement for integrated frameworks to effectively address these interconnected issues (Oberlack et al., 2018). The social-ecological systems framework offers a structure for expanding research on social-ecological interactions and outcomes, suggesting the importance of reconfiguring the meanings of "things" and understanding active actors in concepts of land, nature, and sustainability (Datta, 2015). The socio-technical systems approach emphasizes the intertwined nature of social and technical elements in governance transformations. By exploring the roles of the state in governing socio-technical systems' transformations, previous research highlighted the embeddedness of governance structures within these systems (Borrás and Edler, 2020).

The inquiry into how the land governance system transforms represents an endeavor to comprehend the origins and early stages of the land governance transformation process. This research aims to uncover the initial catalysts and factors that initiate this transformation. Understanding the inception of the transformation process yields valuable insights into the root causes and triggers for change in land governance, thereby shedding light on the historical, social, and environmental contexts that paved the way for transformation.

Westley et al. (2013) proposed a model of systemic change (Figure 1.1) to understand transformation, outlining four phases within an adaptive cycle: exploitation, where resources are recombined in new forms; conservation, where an institutional structure becomes established and resistant to change; release, where the current stable beliefs or ideas are unable to solve existing problems leading to a breakdown of the system; and reorganization, where new ideas emerge to solve existing problems, leading to the establishment of a new system configuration. These phases shed light on the dynamics of resilient social systems and the role of innovation. However, limited research details the release and reorganization phases. Debates persist regarding what triggers a stable system to enter these phases (Busck-Lumholt et al., 2022; Hauer and Nielsen, 2020; Munroe et al., 2019) and why certain governance models are favored over others remain open for interpretation (Abson et al., 2017). This dissertation coupled the socio-ecological perspective, socio-technical perspective, and elements from the leverage points for sustainable transformation.

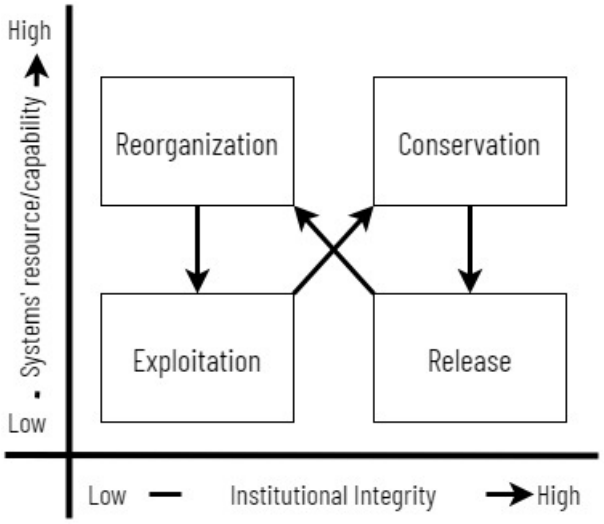

Figure 1.1: The four phases of systemic change.

The leverage points literature suggests that beyond structural changes, how knowledge is generated, shared, and utilized in society can influence system rules or goals (Abson et al., 2017; Fischer and Riechers, 2019). Investigating how knowledge operates as a leverage point in steering the trajectory of land governance transformation seeks to explore how knowledge can effect change, challenge existing power dynamics, and shape governance structures and practices. Recognizing the influence of knowledge as a leverage point is crucial for comprehending the dynamics of transformation and identifying strategic interventions for promoting sustainable land governance.

Exploring the origin or ownership of knowledge and its relationship to the transformation processes delves into the agency and influence of specific knowledge holders in driving the land governance transformation. By identifying the actors and sources of knowledge that initiated the transformation, this research can elucidate the influential stakeholders and their contributions to shaping the trajectory of change in land governance. Ultimately, this exploration aims to understand the power dynamics, decision-making processes, and knowledge landscape underlying the transformation.

Understanding what kind of intervention, which level of intervention, and who should intervene in a transformation is related to understanding the direction of governance transformation. In exploring the dynamics between agencies and transformative actors, previous research highlighted the links between actors, their aims, and their agencies to transformative actions. Actors who aim to promote sustainable land use practices may engage in conservation, reforestation, or sustainable agriculture activities. On the other

hand, actors who prioritize economic development may engage in activities such as land conversion for industrial or urban development (Novotny et al., 2021). Actors who aim to advocate for land reform or the recognition of indigenous land rights may challenge existing power dynamics and institutional arrangements (Chiaravalloti et al., 2017). Similarly, actors engaging in collaborative governance processes may contribute to new governance structures and practices (Lo et al., 2018). Actors who challenge existing land tenure systems or advocate for implementing new land policies can contribute to institutional change (Busscher et al., 2018).

Previous literature provided insights into who should intervene in the form of network and actor links. The link between resourceful economic actors (network and physical) and less resourceful (transformative) sustainable actors can lead to transformative actions in land governance (Andriamihaja et al., 2021; Lundsgaard-Hansen et al., 2018). The link allows sustainable influence 'flow' and changes resourceful actors' aim towards sustainability. However, this argument assumes that actors with different objectives can influence change regardless of power. When agencies align with organizational aims, agencies should be analyzed as strategic actions (Andriamihaja et al., 2021; Geels, 2004; Giddens, 1984). It is difficult to analyze why changes did not happen only by observing the network, allowing transformative action, actors, and their aim or agency.

To fill the gap and answer the remaining challenge in understanding the opportunity of the path-breaking trajectory of land system research, this dissertation explores the overarching question:

> 'How does knowledge interact and influence land governance transformation?'

In more detail, this dissertation separates the overarching question into a three-part questions:

1. How does the land governance system transform?
2. How do leverage points, specifically knowledge, influence the land governance transformation trajectory? and;
3. How does the origin of knowledge affect the transformation process?

The dissertation aims to provide a path-breaking trajectory in navigating the systemic change in land governance from the interplay between knowledge, actors, and the triggers of change, thereby contributing to the overarching goal of elucidating how knowledge interacts with and influences the transformation of land governance. The dissertation is structured as follows:

1. Chapter 2 reviews the theoretical foundation of systemic transformation from socio-technical systems (STS), socio-ecological systems (SES), leverage points literature, and land governance literature, framing land governance as a system. This chapter concludes by presenting a hypothetical framework of systemic transformation in land governance.

2. In Chapter 3, the hypothetical framework is initially applied and tested to delve into how knowledge relates to the transformation processes. This chapter provides a detailed analysis of knowledge production, utilization dynamics, and how regime actors adjust regime rules and goals.

3. Chapter 4 continues applying and testing the hypothetical framework to examine the dynamics of transformation in land governance more closely. This includes exploring how the transformation began and how knowledge serves as a leverage point in steering the transformation trajectory.

4. Chapter 5 synthesizes and discusses the findings from Chapters 3 and 4, providing a comprehensive analysis of the implications and insights gleaned from the research.

5. Finally, Chapter 6 concludes the dissertation, summarizing the key findings, reflecting on the contributions to the field, and suggesting avenues for future research.

Chapter 2

Theoretical Foundations and Analytical Framework

2.1 Introduction

Subsets of land governance literature developed into a few branches: land tenure reform (Hilhorst, 2010), revalorization of land and global governance (Auld, 2010; Sikor et al., 2013; Verburg et al., 2015), and land governance change (Andriamihaja et al., 2021; Kuusaana et al., 2021). Path dependence influences governance in such ways that it becomes difficult to modify institutional structures and processes. Over time, governance arrangements become "sticky" and resistant to change, even when the governance processes themselves are not effective or efficient (Kraus et al., 2005; Klopp and Lumumba, 2017; Goyal and Howlett, 2020). Transforming the path-dependent governance then depends on the possibility of introducing new policies, laws, or regulations to address the challenges and limitations of the existing land governance arrangements (Oberlack et al., 2018; Goyal and Howlett, 2020). However, more research is needed to determine the potential of holistic governance transformation in land governance. Especially approaches that take into account the interdependencies and trade-offs among governance elements. (Klopp and Lumumba, 2017; Goyal and Howlett, 2020; Brown et al., 2005).

The land governance literature has identified issues in analyzing the relationship between governance change and path dependency. The land governance literature often overlooks the influence of historical institutional arrangements and policy decisions on current governance structures and practices. This leads to a lack of understanding of how path dependency shapes governance trajectories and inhibits adaptive responses to changing

environmental and social conditions (Barnett et al., 2015). Moreover, land governance literature also lacks in consideration the interconnectedness of governance systems, the role of distant interactions in shaping local governance outcomes, and the role of community-level initiatives and bottom-up responses in challenging path dependency and fostering innovative governance approaches (Meyfroidt et al., 2022; Van Assche et al., 2022). Land governance literature often overlooks the role of power dynamics and vested interests in perpetuating path dependency in land governance systems (Conteh and Panter, 2017).

The land governance literature can benefit from integrating insights from the systemic and institutional perspective literature to address limitations related to path dependency analysis. These insights help integrate aspects of considering historical legacies, global interdependencies, community initiatives, power dynamics, and institutional arrangements. By applying governance frameworks that consider multi-stakeholder initiatives, decision-making procedures, and resource access, researchers can identify key factors that shape the governance of land resources (Konefal, 2015). Analyzing land governance systems through these frameworks allows for a nuanced exploration of power dynamics, institutional arrangements, and policy mechanisms that influence decision-making processes and outcomes. This approach can provide valuable insights for policymakers, practitioners, and researchers seeking to promote sustainable land use practices and equitable resource distribution within land governance systems (Borrás and Edler, 2020). This discussion is particularly relevant in the context of path dependence, as it provides a framework for understanding how past decisions and processes can shape current and future governance transformations.

The main aim of this chapter is to establish a hypothetical analytical framework for the dissertation, with a particular focus on the concept of path dependence in land governance transformation. This framework will be constructed through a comprehensive review of relevant literature on land governance change, bridging the concept of land governance change with a systems perspective and integrating it with the leverage points literature. Additionally, the chapter will explore how insights from studies on social-ecological systems (SES), socio-technical systems (STS), and leverage points can inform this framework.

The chapter will begin by justifying the emphasis on SES in transitions research, followed by exploring the drivers, barriers, and enabling factors that shape transitions within SES. It will then introduce the concept of leverage for systems transformation, focusing particularly on knowledge as the primary conceptual lever. Finally, the chapter will conclude by presenting the hypothetical analytical framework, which will be applied and tested in the

subsequent chapters.

2.2 Rationale for Emphasizing Social-Ecological Systems (SES) in Transitions Research

Path dependency and lock-ins are analogous concepts across disciplines such as socio-environmental systems, development studies, and agriculture studies (Goldstein et al., 2023). These concepts describe entrapment phenomena where potential change towards alternative practices is limited due to multiple interdependent causes (Goldstein et al., 2023; Geels and Schot, 2007; Gowdy and Baveye, 2019). Breaking path dependency may require a path-breaking opportunity in the form of an alternative pathway and the potential for a systemic transformation (Djelic and Quack, 2007; Geels and Schot, 2007; Goldstein et al., 2023). Analyzing governance change and path dependency in land governance can benefit through adapting elements from SES as it allows for a holistic examination of how governance changes influence and are influenced by ecological dynamics, providing a nuanced understanding of the relationship between governance change and path dependency within land governance systems. The socio-ecological systems approach provides a comprehensive understanding of the interconnectedness between social and ecological components, emphasizing feedback loops and interdependencies that shape governance outcomes (Westley et al., 2013).

While there is a need for a unifying definition of social-ecological systems (SES), this chapter define SES as a system where basic features interact, providing feedback and influencing outcomes (Colding and Barthel, 2019). These features include resources, resource users, and public infrastructure. Private actors or the general public utilize resources, while public infrastructure providers, typically the government, govern the resource use. Public infrastructure encompasses the institutions and rules used by those governing, managing, and utilizing the system, including monitoring and enforcement (Ostrom, 2009; Anderies et al., 2013).

Deliberate regime structure change is possible and within the scope of individual and collective agency (Moore et al., 2014; Giddens, 1984). Overcoming the structural dependency of agency can start from having 'different' power relations to the existing system, such as aligning with other powerful actors (Johansen and van den Bosch, 2017; Avelino and Rotmans, 2009; Giddens, 1984). During the system change, there are four phases: exploitation, conservation, release, and reorganization (Westley et al., 2013). Institutions are assumed to be open to reinterpretation when they lose dominance during

the release and reorganization (Westley et al., 2013; Geels, 2010). Triggers, such as protests or social resistance from actors dependent on certain environmental resources, are often considered potential turning points for reinterpretation. These triggers provide opportunities to be captured or responded to by other actors (Moore et al., 2014; Westley et al., 2013). In this phase, actors (individuals or collectives) capitalize on 'windows of opportunity' through strategic agencies and leverage for change (Abson et al., 2017).

2.2.1 Complementing SES with Socio-technical Systems Transformation Trajectory

The socio-technical systems (STS) perspective complements the socio-ecological systems (SES) perspective by shedding light on how social innovation, institutional arrangements, and stakeholder interactions shape or disrupt path-dependent behaviors (Loorbach et al., 2017; Seeliger and Turok, 2013). Especially when social innovation and transformation emerge from the dynamic interactions between actors and institutional frameworks, highlighting the need for a nuanced approach to navigating transitions (Moore et al., 2014). The trajectory of socio-technical interaction of social innovation, structural change, and incremental changes along existing trajectories (reproduction) can be broken down into the sequence of morphogenetic cycles to explain the phases of transformation (Geels and Schot, 2010; Geels and Raven, 2007). By breaking down the trajectory, morphogenetic cycles offer insights into how power relations, innovation, and path-breaking initiatives influence the evolution of governance systems (Bruttel and Friehe, 2014). Moreover, it allows for a nuanced understanding of how persistent institutional arrangements interact with dynamic capabilities to reinforce existing paths or create new trajectories (Fendick and Whitt, 2021). These insights help the analysis to better grasp the complexities of decision-making processes, policy formulation, and institutional development within socio-ecological systems dynamics (Vergne and Durand, 2010).

STS follow a stable trajectory within certain institutional rulesets embedded in deep cognitive structures (belief systems, problem agendas, search heuristics) (Geels, 2010). The structures constrain action and limit variations to a particular direction, resulting in incremental developments along a specific path (Rip and Kemp, 1998; Geels, 2010). The constraining structures do not exist autonomously but rather from the previous and existing actions, experiences, and knowledge of actors (Geels, 2004, 2010). Considering the agency as conscious and strategic actors' actions, their agency reproduces

rules and operates in the context of rules, practices, or belief systems (Giddens, 1984; Geels, 2004). These agency mechanisms are described in the socio-technical literature as a morphogenetic cycle that preserves the stability of the structure (Geels, 2004, 2010). The structures are often referred to as a regime.

Under a stable regime, a seed of change can arise from radical novelties developed in the niche, a place of not-so-strict rules and regulations where deviations from the regime are possible (Geels, 2004). These radical novelties have niche structures to solve socio-technical problems (Geels, 2004, 2020). In socio-technical perspective literature, some 'windows of opportunity' or breakthroughs need to happen for niches to be adopted. While stable, a regime is semi-coherent. A semi-coherent regime means several less dominant institutional rulesets can guide actions with similar purposes (Fuenfschilling and Truffer, 2014). Usually, these different rulesets are coordinated, dampening tensions (Geels, 2004). At times, there can be fluctuations within a semi-coherent regime, causing tensions, misalignment, and instability (Geels, 2011; Fuenfschilling and Truffer, 2014). During the instability, these rulesets users compete for resources and legitimacy, providing multiple interpretations of a problem and its solution. Some rulesets are capable of gaining more resources and legitimacy compared to others. These rulesets become dominant, gain retention, and influence the future development trajectory (Geels, 2020).

Changes in the landscape level can also influence regime stability. Changes in the landscape level in socio-technical landscape cover a wide variety of things, from climate change, negative environmental externalities, or changing user preferences (Geels, 2004). These landscape changes become a problem for the regime when there are no solutions or problematized by external groups of actors. Niches may develop with some promising answers. Novel institutional structures are developed and adopted by the regime. Their adoption into the regime will require some adjustments in the regime structure and influence the development trajectory (Geels, 2010).

The trajectories of STS transformation are non-linear. It is determined by the availability of resources in the regime to withstand instability and the agency of actors over their network (i.e., resource, power, and network) (Frantzeskaki et al., 2012; Smith et al., 2005). Rich and coordinated regimes can withstand instability through endogenous renewals, whereas rich and uncoordinated regimes must reorient their trajectories every time instability occurs. The poor and coordinated regime can purposefully follow societal expectations as the next successor. Last, poor and uncoordinated regimes will experience unintended, emergent transformations. In this perspective, external intervention works with niches through a safe space to withstand the

agency of regime actors (Smith et al., 2005). Radical change is then about timing whether a landscape shock can make a regime uncoordinated enough to lead to purposeful or emergent transformation.

2.3 Drivers, Barriers, and Enabling Factors Shaping Transformation in Social-Ecological Systems

Drivers are the forces or factors that directly or indirectly cause changes within a system. It is often associated with opportunities for innovation and adaptation, driving the system towards new states or configurations (Olsson et al., 2014). These drivers can be external or internal. External drivers include environmental changes, policy decisions, or market forces. Internal drivers include social dynamics or technological advancements (Folke et al., 2010). For example, External drivers, such as environmental changes, policy decisions, and market forces, significantly influence transitions within social-ecological systems (Frawley et al., 2019; Oberlack et al., 2021). These external drivers increasingly impact various sectors, including small-scale fisheries, agriculture, and forestry, highlighting the interconnectedness of social and ecological components (Buchadas et al., 2022; Wilson et al., 2017). Extreme changes are driven by the shock that occurs in the broader context of 'ecological, economic, or social (including political) conditions' and can open up windows of opportunities (Olsson and Galaz, 2012; Walker, 2012). Transformation is achieved when actors capitalize on windows of opportunity and link the SE innovation to the existing organization and institutions (Olsson and Galaz, 2012; Olsson et al., 2004).

Enabling conditions are the supportive factors that facilitate and enhance the transformation process within socio-ecological systems. These conditions create a conducive environment for change by providing resources, capacities, or structures that support adaptive governance, innovation, and collaboration (Huber-Stearns et al., 2017). Transformative agency, collaborative networks, involvement of diverse actors, and traditional or radical knowledge are among the examples of enabling conditions that foster innovation or collaboration and potentially enhance the process of transformation within socio-ecological systems (Huber-Stearns et al., 2017; Westley et al., 2013; DeCaro and Stokes, 2013). Further, it is hypothesized that a deliberate regime transformation is possible and within the scope of individual and collective agency (Moore et al., 2014; Giddens, 1984). Overcoming the structural dependency of agency can start from having 'different' power relations to the

existing system as an enabling condition, such as aligning with other powerful actors (Johansen and van den Bosch, 2017; Avelino and Rotmans, 2009; Giddens, 1984).

Barriers, on the other hand, are factors that impede or hinder the process of transformation within socio-ecological systems. These barriers can be social, economic, institutional, or environmental in nature and may include issues like a lack of resources, conflicting interests, or inadequate governance structures (Piemontese et al., 2021). These barriers can stem from various sources, including social, economic, institutional, and environmental challenges. For example, inequalities rooted in social structures, power dynamics, and conflicting interests can hinder effective decision-making and action, influencing system transformation (Dade et al., 2022; Ollivier et al., 2018). Incorporating multi-level values, addressing power dynamics, and promoting agency for social-ecological transformation have been identified as strategies to overcome barriers and facilitate transitions within these systems (van Riper et al., 2018; Charli-Joseph et al., 2018).

To overcome barriers, such as power dynamics and conflict of interest, strategic agencies have an embedded element of power and certain intended goals (Geels, 2004; Giddens, 1984). Further, influential actors often target specific structures in the regime (e.g., institutional or technological fixes) to facilitate system transformation (Westley et al., 2013; Olsson et al., 2006; Walker et al., 2004). Strategic agencies are typically not concerned with individuals but rather groups of individuals or actors taking actions to influence change (Westley et al., 2013). The literature shows that the deliberate action from the interplay of actors, strategic agencies, and structure influences the transformation trajectory (Andriamihaja et al., 2021; Moore et al., 2014; Westley et al., 2013).

From the description above, it is visible that drivers, barriers, and enabling conditions play distinct roles in influencing systems transformation within socio-ecological systems. During the system transformation (Figure 1.1), drivers initiate changes, providing opportunities to be captured or responded to by other actors (Moore et al., 2014; Westley et al., 2013). Enabling condition support and facilitating transformations so that actors (individuals or collectives) capitalize 'windows of opportunity' through strategic agencies and leverage for change (Abson et al., 2017). Institutions are assumed to lose dominance if no barriers hinder the transformation's progress. Here, institutions and beliefs are open to reinterpretation. Some institutions and beliefs dominate institutional structure and become established and resistant to change (Westley et al., 2013; Geels, 2010). How some institutions and beliefs were able to dominate the institutional structure will be further explored using the concept of leverage points for sustainable transformation.

2.4 Leverage for Systems Transformation

The concept of leverage points, introduced by Meadows (Meadows, 1999), involves identifying areas within a system where adjustments can be made to reconcile the perceived state with the system's goal. Meadows outlines twelve such intervention points, ranging from least to most effective. The effectiveness of an intervention correlates with the likelihood of system change. Abson (Abson et al., 2017) further categorizes these leverage points into shallow and deep interventions across four broad characteristics: parameters, feedback, design, and intent. Additionally, the author emphasizes three crucial realms of leverage for sustainability transformation: institutional design and decline, people's influence on sustainable outcomes, and knowledge production and use in transformative processes. This research specifically focuses on institutional decline and knowledge production and use. The literature on sustainable transformation underscores the significance of sustainability interventions, particularly the restructuring of institutions, and the role of knowledge creation and utilization in achieving sustainability goals (Abson et al., 2017; Leventon et al., 2021; Fischer et al., 2022). Building upon the SES and STS literature, it is observed that social systems typically respond to both external and internal pressures (Olsson and Galaz, 2012; Geels, 2010; Abson et al., 2017). Regarding the restructuring of institutions, it is hypothesized that key leverage lies in four potential approaches:

1. Deliberate policy design, ensuring institutions are open to transformative learning or adaptation.

2. Purposeful destabilization of unsustainable institutions.

3. Integration of governance learning mechanisms. Long-term institutional decline over time.

Despite the seminal work on leverage points (Abson et al., 2017; Meadows, 1999), there remains a gap in understanding how institutional decline occurs and how knowledge influences transformation. The recent empirical literature on sustainability interventions in food and energy issues (Dorninger et al., 2020) suggests a strong focus on intervening in more tangible sustainable leverages such as systems' 'parameters' or 'design'. Similarly, a literature review of coastal and marine pollution literature indicates that most interventions focus on addressing parameter system characteristics and design (Riechers et al., 2021). Leverage points of sustainable transformation (Abson et al., 2017) argue that influencing the system's 'intent' (goal) shapes the 'design' of the system. Moreover, interventions strategically target the goals

of a system, its intent, and rules, including knowledge production (Dorninger et al., 2020). How knowledge is created, shared, and used in society crucially influences transformation processes, especially the system's intent, which, in turn, potentially influences the system's parameters, feedback, and design (Abson et al., 2017; Dorninger et al., 2020; Woiwode et al., 2021). A review of socio-technical systems transformation in the energy, mobility, and food sectors indicates three types of measures that drive systemic transformation: legislative and regulatory measures, voluntary initiatives, and design and innovation frameworks (Gaziulusoy, 2015). Further, the socio-ecological system literature emphasized the importance of understanding interactions among human and nonhuman elements, such as knowledge and collaborative learning, that can drive transformation from within the system (Schlüter et al., 2019; Horcea-Milcu et al., 2020). This is akin to the concept of 'deep' leverage discussed in the leverage points for sustainable transformation literature. Deep leverage points are intervention points that are difficult to alter but are hypothesized to have the potential to drive transformational change (Abson et al., 2017; Meadows, 1999). These deep leverage points are (i) social structures and institutions managing interactions between system elements and (ii) underpinning values, goals, and world views of actors shaping the systems' direction. These two elements are (i) design and (ii) intent.

2.4.1 Knowledge as Lever for Systemic Transformation

STS and SES perspective literature emphasizes the critical role of knowledge in systemic transformation. Transformation in both perspectives involves enduring changes characterized by co-evolutionary developments between knowledge and other societal subsystems (Berkes et al., 2000; Fuenfschilling and Truffer, 2014; Geels, 2002). In socio-ecological systems literature, it is observed that local ecological knowledge guides resource management decisions based on feedback from the environment (Berkes et al., 2000). Further, previous research has emphasized agency, which, informed by knowledge and entrepreneurship, can lead to systemic changes (Westley et al., 2013; Lam et al., 2020). The emergence of sustainable practices and socio-technical innovations further exemplifies the interplay between knowledge and systemic transformation. For instance, the transition towards renewable energy technologies and the adoption of circular economy principles are facilitated by disseminating and applying knowledge across multi-level governance and stakeholder networks (Bergek et al., 2008; Hölscher et al., 2019). In this regard, knowledge acts as a catalyst for steering systemic shifts toward more sustainable and resilient configurations. Changes in knowledge and perception during a systemic change have also been observed when actors need to

adapt to changes by generating new skills or learning through new knowledge (Apgar et al., 2015; Andrachuk and Armitage, 2015; Homann et al., 2008). Additionally, knowledge is crucial in challenging and transforming existing institutional structures and norms (Hjerpe et al., 2017). However, like governance is susceptible to path dependency, it can also influence knowledge production (Rizzello, 2004; Van Assche et al., 2014). Previous literature has witnessed the phenomenon in multiple aspects of literature, such as tropical marine science (Partelow et al., 2020), biotechnology (Heimeriks and Boschma, 2013), and economic development (Henning et al., 2013), to mention a few. Furthermore, sustainability problems are often caused by the complex interplay of diverse socio-ecological or socio-technical factors. These factors call for different types and sources of knowledge in collaborative research and learning processes, 'Iterative and collaborative processes involving diverse types of expertise, knowledge, and actors to produce context-specific knowledge and pathways towards a sustainable future', a knowledge co-production (KCP) (Norström et al., 2020; Abson et al., 2017; Olsson and Galaz, 2012). The above description is illustrated in Figure 2.1 below.

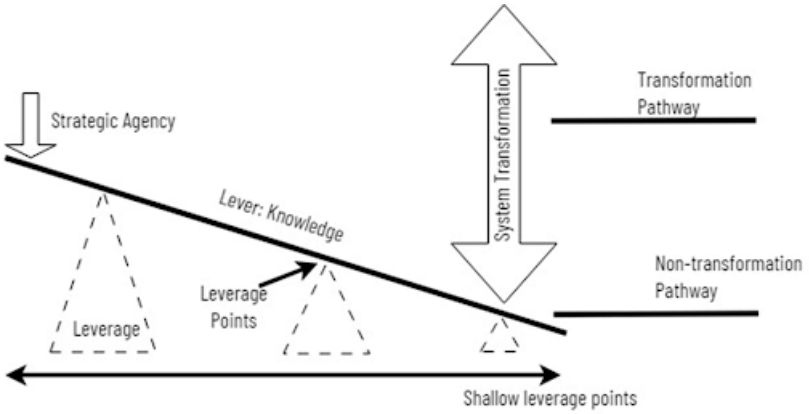

Figure 2.1: An illustration of how the elements of systems transformation and leverages influence transformation pathways.

Source: Modified from literature (Dorninger et al., 2020; Geels, 2004; Abson et al., 2017; Olsson et al., 2004)

Knowledge Co-Production for Sustainable Transformation

Knowledge co-production (KCP) is defined as "iterative and collaborative processes involving diverse types of expertise, knowledge, and actors to pro-

duce context-specific knowledge and pathways toward a sustainable future" (Norström et al., 2020). The literature on knowledge production suggests that knowledge co-production is ideal to pursue inclusivity to produce knowledge benefitting the knowledge producers because it allows diverse types of expertise, knowledge, and actors (Latulippe and Klenk, 2020; Norström et al., 2020; Zurba et al., 2022). The co-production process involves multiple stakeholders cooperating and aiming to formulate shared perspectives and understandings; it bridges problems, benefits stakeholders, and promotes shared responsibility (Florin and Lindhult, 2015; Habermas, 1990; McCulloch, 2015). Co-production intervention works by providing actionable coproduced knowledge as one of the promising venues for sustainable transformation research (Oteros-Rozas et al., 2019; Bixler et al., 2019). Having actionable, co-produced knowledge enables governance that supports sustainability and the social dynamics to act on governance processes (Miller and Wyborn, 2020).

An ideal high-quality KCP is assumed to have four principles in its processes: context-based, pluralistic, goal-oriented, and interactive (Norström et al., 2020). Context-based means that the knowledge production processes should be considered for and situated within a particular social, economic, and ecological context for which they are produced. Pluralistic means explicitly having some ways to recognize multiple ways of knowing and doing. The pluralism in knowledge co-production is also understood as having a multidisciplinary approach to address complexity in the recent science-policy interface literature (Jagannathan et al., 2023). Goal-oriented means the process is problem-focused and has some mechanism to define and share a similar collective understanding of the problems and goals. Further, the shared goals and problem-understanding lead to new forms of governance that can pursue more sustainable goals (Miller and Wyborn, 2020). The processes also need to be interactive, meaning having multiple interactions throughout the process and avoiding token participation. It is important to note that the interactions may not be one-to-one and can be few to plenty depending on the actors and KCP phases (Pohl et al., 2021).

However, knowledge created through an ideal KCP process only matters to the possibility of change depending on how the knowledge is interacted, engaged, and used to construct or empower institutions to facilitate transformation (Miller and Wyborn, 2020). While the success of KCP production and how it can influence governance is still debatable (Jagannathan et al., 2023), the literature on governance studies provided insights into how institutions generate knowledge and influence governance capacity (Howlett and Ramesh, 2016). Coproduced knowledge requires operationalization to improve governance. Successful KCP can cover the analytical, managerial,

and—to some extent—political competencies. That is, improving policy capacity and analytical competencies can be done by having a better knowledge of policy substances, better institutions, and opportunities for knowledge generation. Managerial competencies can benefit from robust, coordinated actions between stakeholders and engaging policy networks. Political competencies can be improved by understanding different stakeholders' needs, inter-organizational trust, and two-way communication with non-state actors (Howlett and Ramesh, 2016). As policy capacity improvement intersects with successful KCP practice, generating coproduced knowledge can impact policy capacity and governance. In addition, effective administrative structures, processes, coordination, and political support are keys to effective operationalization (Sorrentino et al., 2018).

2.5 Hypothetical framework

Based on the above arguments, this chapter builds a hypothetical analytical framework to analyze land governance transformation. The framework (Figure 2.2), in principle, utilizes the elements based on socio-ecological systems while owing much to morphogenetic cycles of STS to elaborate steps and trajectories of transformation. The hypothetical framework of this dissertation is presented as follows:

1. A system's structural instabilities are caused by some triggers ('when') that can be exogenous or endogenous to the system. A system's structure refers to the social institution, rules, practices, or belief systems that sometimes constrain action and limit variations to a particular direction. 'When' landscape shocks destabilize structures, power relations and norms are being questioned (1).

2. The triggers destabilize the systems' institutional and some actors' ('who') cognitive structures (2). An actor's cognitive structure is relevant to the actors' belief systems, problem agendas, or search heuristics.

3. The system's structural and some actors' cognitive structure instability led certain actors to innovate, try to resolve problems and prevent the system from transforming or pushing it to transform through their agency ('how'). Actors' agency can be understood as actors' conscious and strategic actions.

4. During the actors' cognitive structure instability, intervention through knowledge co-production also increases individual capacity to produce

new ideas or problem framing, resulting in new or revised practices or problem re-framing. Further, these new or revised practices and problem re-framing feed into the community, providing context on the community's problem agendas or search heuristics.

5. The system is transformed when strategic actions and hypothetical leverage points ('where') are combined (3) for transformation to successfully leverage innovation or problem framing to broader adaptation (4).

6. The system can also withstand the instabilities (2'), reorient, and re-stabilize with some, albeit not radical, changes in the systems' structure or actors' cognitive structure.

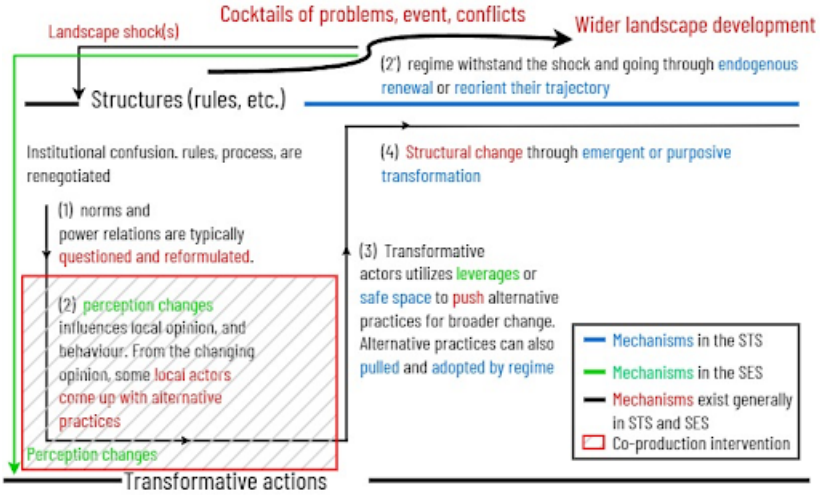

Figure 2.2: The hypothetical analytical framework of the dissertation.

Note: Blue lines and blue text denote processes taken from the STS perspective. Green lines and text denote processes taken from the SES perspective. Black lines and red text denote processes described in both STS and SES. The shaded box denotes the scope of the co-production intervention.

Source: Compiled by the author based on (Frantzeskaki et al., 2012), (Geels, 2010), (Mathias et al., 2020), (Smith et al., 2005)

The transformation in SES may follow a similar non-linear trajectory of instability and change as in STS. Similarly, SES views the trajectory changes through the interaction of a broader landscape, actors' coordination, and

agency. However, in SES, the landscape influences the agencies through perception changes. The timing is then related to the time when the perception of the landscape condition changes (Mathias et al., 2020). The difference between non-linearity among STS and SES is in how both view innovations and make their way into the regime. Traditional STS emphasizes the selection process (e.g., market selection) where reproduction or transformation of the emergent institutional configuration occurs (Geels, 2020). SES selection emphasizes increasing the legitimacy of the said innovation, influencing the regime configuration, and being adopted as is (Moore et al., 2014; Smith and Raven, 2012). Nevertheless, analyzing governance transformation should include actors, agencies for change, timing, and specific structures.

Chapter 3

Knowledge from flawed governance? A case study of Indonesian sustainable palm oil

3.1 Introduction

Transitioning land governance regimes often coincide with institutional reforms, policy experiments, and shifts in policy paradigms (Jepsen et al., 2015). These transformations, influenced by factors like changes in agrarian policies and policy experimentation (Kaisa et al., 2017) or changes in institutional design (Hamidov et al., 2015), underscore the dynamic interplay between knowledge and governance mechanisms. Further, wider changes, such as policy shifts or institutional reforms, will be required as incremental changes in the decision-making process may prove insufficient for transformation and even hinder the progress toward transformation (Jeffers, 2020).

The literature on system transformation highlighted the barriers that stem from various sources, including social, economic, institutional, and environmental challenges, such as unequal power dynamics and conflicting interests (Dade et al., 2022; Ollivier et al., 2018). Similarly, the literature on system transformation and knowledge production highlighted similar barriers focusing on the historical and cultural contexts in shaping power dynamics and who participates in decision-making (Miller and Nadeau, 2017; Lavorel et al., 2019; Phillips et al., 2021). Conflicting interests between stakeholders with varying agendas have been known to impede governance processes, such as creating disputes or contests stemming from regulatory frameworks (Dhiaulhaq et al., 2015; Akaateba, 2019).

As the historical and cultural contexts shape power dynamics and who

participates in decision-making, it is crucial to involve collaborative efforts to create new knowledge through dialogue considering diverse perspectives and values to avoid the tendency of systems to follow historical trajectories based on past knowledge and experiences (Brugnach and Ingram, 2012; Callaert et al., 2015). Different actors can bring unique insights and expertise to challenge existing assumptions and break free from path-dependent patterns (Jacobi et al., 2020). In addition, transformative agency, collaborative networks, involvement of diverse actors, and involvement of traditional or radical knowledge are among the enabling conditions that may foster innovation or collaboration and potentially enhance the process of transformation (Huber-Stearns et al., 2017; Westley et al., 2013; DeCaro and Stokes, 2013).

The literature on system transformation and knowledge co-production showed that transdisciplinary knowledge co-production had been acknowledged as a mechanism for generating impactful outcomes (Schneider et al., 2019). Actionable, co-produced knowledge enables governance that supports sustainability and the social dynamics to act on governance processes (Miller and Wyborn, 2020). Integrating local knowledge into the land governance process is gaining recognition as a valuable approach for a more holistic and sustainable approach to improve land governance (Gordon , Iñupiaq; van der Molen, 2018).

Knowledge created through an ideal co-production process will depend on how the knowledge is interacted with, engaged, and used to construct or empower institutions to facilitate transformation (Miller Wyborn, 2020). The literature suggests that transformative actors leverage their agency and engage in knowledge co-production processes to generate new insights, challenge established norms, and co-create innovative solutions (Moore et al., 2014; Plummer, 2009). By engaging in collaborative knowledge co-production, actors can navigate complexity, promote learning, and co-create solutions that address systemic challenges and promote sustainability (Lavorel et al., 2019; Ernst and Preston, 2017). Through their agency, these actors navigate complex governance landscapes, identify leverage points for change, and promote adaptive strategies that can lead to transformative governance outcomes (Jacobi et al., 2020; Bruley et al., 2021). However, there is a need for more in-depth investigations into the characteristics and strategies of transformative actors (Jacobi et al., 2020).

3.1.1 Hypothetical Framework of Knowledge Co-Production

As this dissertation has discussed in Chapter 2 about the relation between knowledge as leverage for transformation and the transformation dynamics, this chapter assumes that at an individual and community level, the interac-

tions between individual perceptions change due to crises (Phase 2 of Figure 2.2). The intervention through knowledge co-production increases individual capacity, new ideas, or problem options, resulting in new or revised practices. These individual practices feed into how the community perceives crises and problems, influencing the existing elements within the community and providing context on how the knowledge can be further used to solve existing problems by establishing new or revised practices. Transformative actors and their strategic agencies will help the new practices for broader changes.

The interaction between actionable knowledge in various levels (individual, community, policy) and governance systems in catalyzing transformation has been explored (Wyborn et al., 2019; Turnhout et al., 2020; Miller and Wyborn, 2020). As shown in Figure 3.1, knowledge co-production (KCP) allows for creativity in generating new ideas and reframing problems at the individual level and can lead to increased community governance capacity (Page et al., 2016; Wyborn et al., 2019). KCP can also help redistribute institutional power in a community setting, where alternative practices are needed to challenge the status quo (Frey and Berkes, 2014; McMillan et al., 2014). The connection between the intervention outcomes from individuals and communities is introduced as a feedback loop shaping the individual, community, or policy (Wyborn et al., 2019). At an individual and community level, the interactions between individual perceptions change due to crises (Benessaiah and Eakin, 2021), and the intervention through knowledge co-production initiating increased individual capacity, new ideas, or problem options, resulting in new or revised practices.

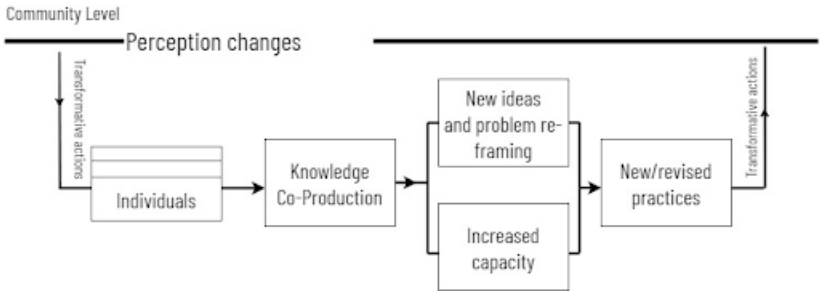

Figure 3.1: The feedback loop of knowledge co-production at individual or community levels.

Source: Source: Adapted from (Wyborn et al., 2019).

This chapter will focus on the second phase of the morphogenetic cycle to explore the characteristics and strategies of transformative actors. Using the knowledge co-production lens, it asks the question, 'How does the origin of

knowledge affect the transformation process?' and investigates stakeholder participation in strengthening the institutional structure of Indonesian palm oil regulation. Indonesia's palm oil sector presents a unique opportunity to study these dynamics due to its stakeholder involvement, which goes beyond mere consultation, contrasting with the trend in the majority of initiatives within the limited research linking co-production and governance (Galende-Sánchez and Sorman, 2021; Apetrei et al., 2021)

The intervention of KCP introduces changes in the ideas or problem framing. The new knowledge originated from co-production, rather than individual perception, feeds into how the community perceives crises and problems, influencing the existing elements within the community and providing context on how the knowledge can be further used to solve existing problems by establishing new or revised practices. Transformative actors and their strategic agencies will help the new practices for broader changes. This chapter will explore the agency and influence of specific knowledge holders in driving the transformation of land governance.

3.2 Methodology

3.2.1 Introduction of the Case Study

This chapter will use sustainable palm oil in Indonesia as a case study. Through the case of palm oil, this chapter will also elaborate on the characteristics and strategies of transformative actors in driving the transformation of land governance. Large-scale agriculture, such as palm oil, has been experiencing substantial agriculture intensification and increased importance due to the growing food demand (Tieskens et al., 2017). The expansion of palm oil plantations often involves large-scale land acquisitions, entrenched practices or structures, and historical and ongoing policies that support and incentivize large-scale monoculture plantations (Wicke et al., 2011; Gatto et al., 2015; Obidzinski et al., 2013). A recent study on the palm oil governance complex explored major gaps in capacity, cooperation, compliance, and credibility of the governance of the palm oil sector (Pacheco et al., 2018a). These gaps accrue to the existing problems affecting the palm oil governance complex, such as the relatively uneven allocation of resources, access to land, resources, and markets; uneven power distribution among palm oil stakeholders, and environmental landscapes; decentralized and opaque decision-making processes combined with intertwined interest; and land allocation transparency. In addition, Indonesian palm oil governance suffers from ineffective governance at the local and regional levels due to persistent structural challenges (Putri

et al., 2022).

Recently, efforts have been made to improve sustainable palm oil governance by strengthening the institutional structure of Indonesian palm oil regulation and revamping the Indonesian Sustainable Palm Oil (ISPO). One of the strengthening processes involving multi-stakeholders was drafting a policy paper. In drafting the policy paper, various stakeholders were invited to participate in a Focus Group Discussion (FGD), a SWOT analysis, and workshops on palm oil plantations conducted and managed by the Indonesian Ministry of Planning (Bappenas). Stakeholders involved in the process include plantation owners, farmers, civil societies, and civil society organizations (Putri et al., 2022; Pacheco et al., 2018b). The policy paper document was the final product of the FGD, SWOT, and workshops.

3.2.2 Methodology

To answer the research question, this chapter employs a case study approach to explore the characteristics and strategies of transformative actors. Investigating from a case study perspective is relevant because the observation has no control over behavioral events, the case is a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not evident (Yin, 2017). Numerous studies have used the case study approach to understand complex transformative phenomena and found that case studies are a powerful tool for researchers to investigate intricate phenomena, generate impact, inform policy-making, and advance knowledge across various disciplines. For example, McCarthy et al. (McCarthy et al., 2014) explored the relational dynamics between actors/charismatic visionaries and the relevant social structures/systems. Padilla and Kofinas (Padilla and Kofinas, 2014) used a single case study to evaluate the application of traditional knowledge in governance systems that combine state control with local, decentralized decisions. Further, Williams et al. (Williams et al., 2020) used a case study approach to explore incorporating public values in social-ecological system governance.

This chapter constructs two case studies, the initial ISPO creation and ISPO strengthening. To construct the initial ISPO creation case, this chapter gathers evidence from the Bappenas policy paper and news articles obtained through the Lexis Database (Table A.2) between January 1, 2010, and December 31, 2020, with Indonesian language containing keywords “ISPO” and “kelapa sawit” (oil palm). Specifically, this chapter focused on news articles covering the process of KCP and actors’ and stakeholders’ responses to changes in ISPO regulations. To construct the ISPO strengthening case, this chapter gathers evidence from an unstructured expert interview on February

23, 2022, with members of the Indonesian Biodiversity Foundation (KEHATI), a leader in the Strengthening Palm Oil Sustainability (SPOS) Indonesia program (Table A.3). This chapter also used additional sources, such as scientific publications and other supporting documents from gray literature, such as reports and media briefings.

In analyzing the case study, this chapter assumes the ISPO regulation as a policy action resulting from KCP for governance (Table 3.1). In other words, the Bappenas policy paper used for ISPO regulation is considered a form of coproduced knowledge using principles of successful sustainability research (Norström et al., 2020). These principles are illustrative in nature, not exhaustive, and offer practical guidance and assessment questions to evaluate co-productive practices.

Table 3.1: Application of the principles of knowledge co-production in sustainability research in the Indonesian Sustainable Palm Oil (ISPO) case study

Principles	**Explanation**	**Application in ISPO case**
Context-based	The co-production process situated in an embedded context of particular problems and challenges	The co-production process to improve palm oil governance and solve relevant environmental issues around palm oil production in Indonesia
Pluralistic	Involvement of academics (from various disciplines) and stakeholders from other sectors (government, business, civil society, and local and indigenous community) to generate an enriched understanding of the problem	Involvement of academics, government (regional and local level), plantation managers, smallholder farmers, and civil society members to achieve a shared understanding of environmental problems surrounding palm oil production
Goal-oriented	Develop a collective understanding among all participants and agreed-upon measures of success	Develop agreed-upon measures and milestones to govern Indonesian palm oil production and navigate current environmental problems

Continued on next page

Table 3.1 – continued from previous page

Principles	Explanation	Example of assessment questions
Interactive	Frequent interactions among participants throughout the process, from framing and research to using and disseminating the generated knowledge	Stakeholders actively engage and interact through repeated conversations or events to create, use, and disseminate co-produced knowledge

Source: Author interpretation of principles of knowledge co-production in sustainability research (Norström et al., 2020)

3.3 Result: The ISPO as Coproduced Knowledge and Sustainable Governance

The ISPO is an environmental governance tool initiated by a ministerial decree in 2011; subsequently, it was refined in 2015 and strengthened in 2020 (Putri et al., 2022). It is known that the ISPO is a regulatory tool created in response to RSPO certification (Wijaya and Glasbergen, 2016), an act of authority claims from private sustainability standards such as RSPO (Higgins and Richards, 2019; Schouten and Bitzer, 2015), or a measure to complement private sustainability standards (Pacheco et al., 2018b). The ISPO was created after the Indonesian government carried out a "watch and see" strategy and participated in RSPO activities to provide technical and regulatory expertise for creating a national interpretation of RSPO for industries and smallholders (Wijaya and Glasbergen, 2016). This involvement provided state actors with sufficient information about sustainability standards and certification procedures and established a state regulation for sustainable palm oil (Wijaya and Glasbergen, 2016).

3.3.1 The ISPO as Coproduced Knowledge

Indonesian Minister of Agriculture Decree No. 25/2017 about Procedures for Establishing Laws and Regulations within the Ministry of Agriculture mandates that regulation established under the agricultural ministry, such as the ISPO, must accompany the regulation draft alongside i) a policy paper, ii) a digital copy of the regulation draft, iii) minutes of the internal discussion on the draft and a list of attendees, and iv) minutes of public discussion on the

draft and a list of attendees. The policy paper and public discussion involve public stakeholders, including farmers and agricultural businesses (Wijaya and Glasbergen, 2016). The policy paper includes a literature study and is the product of multi-stakeholder interactions, including FGD, discussions, and seminars. The procedure for creating the policy paper aligns with KCP requirements, as it involves diverse actors trying to address challenges and influence actions that can contribute to sustainability (Norström et al., 2020; Zurba et al., 2022).

The context of ISPO creation

The ISPO regulatory draft began with four general issues surrounding Indonesian palm oil industries: technology, economy, social aspects of local farmers, and the environment. While each issue involves different stakeholder constellations, the main stakeholders include smallholder plantations, private plantations, and palm oil manufacturers. The issues listed in the policy paper (Table 3.2) encompass a variety of stakeholders and were generated from an interpretation of studies used in the policy paper. Most of the contexts in the problem mentioned in the policy paper were related to domestic development or certain issues. For example, regarding technological issues, the productivity gap between smallholder plantations on the one hand and private and government plantations on the other came from an earlier study (Teoh, 2010) and data from Statistics Indonesia (Badan Pusat Statistik, 2009). Added-value opportunities were derived from interpreting the ratio of the export-ed amount of crude palm oil (CPO) export versus CPO derivatives and the types of derivatives. Regarding economic and social problems, low productivity issues were related to other factors, such as aging plants, limited access to capital and resources, and market structure.

Table 3.2: List of issues related to sustainable palm oil development in the policy paper supporting Indonesian Sustainable Palm Oil (ISPO) creation

Issue Category	Related Stakeholders	Issues
Technology	Smallholders and private plantation	• Productivity gap between smallholders and private plantations • Lack of industries downstream from crude palm oil and opportunities for added value
Continued on next page		

Table 3.2 – continued from previous page

Issue Category	Related Stakeholders	Issues
Economy	Smallholders, private plantations, NGOs, and Roundtable on Sustainable Palm Oil (RSPO) Representatives	• Low productivity at smallholder plantations due to aging and intensification difficulties related to capital and resources • International competition with other vegetable oil producers and related international NGOs promoting RSPO
Social aspects of local farmers	Smallholders, private plantations, funding institutions (banks), and palm oil association	• Land use, land use rights, and land ownership conflicts among smallholder plantations • Institutional barriers preventing smallholders from accessing funding and market information
Environment	Smallholders, private plantations, and local governments	• Deforestation, climate change, and biodiversity loss • Concession management and politics • Information transparency problems leading to conflicts

Source: Author's interpretation of policy paper document (Bappenas, 2010)

Regarding environmental issues, the report reinforced the findings of a previous study (Teoh, 2010) regarding the relationship of palm oil plantations to deforestation and biodiversity loss, as well as their impact on climate change. Some RSPO-certified plantations are considered to have fewer environmental problems than non-certified plantations. Additionally, the policy paper acknowledged the possibility of deforestation due to procedural problems, such as contradictions in regulations related to converting forest land into land for other uses (Nurrochmat et al., 2020; Putri et al., 2022).

In contrast to nationally focused issues in technology, the social aspects of farmers, and economic issues of Indonesian palm oil pay attention to both national and international context, that is, competition among other vegetable oils. From approximately 2005–2007, exports of CPO and refined palm oil to the European market increased due to an increased demand for biodiesel, decreasing local vegetable oil production (such as rapeseed oil and sunflower oil, which are substitutes for palm oil), and for palm oil in the food industry (Rifin, 2010b). Simultaneously, the Indonesian government planned to build a large-scale palm oil plantation. The establishment would have potentially

displaced 1.8 million ha of forest (The Jakarta Post, 2009). However, the plan was abandoned after considering the geographic location and soil conditions.

Nevertheless, the plans had already been made public, and in response, nongovernmental organizations (NGOs) launched environmental campaigns against the establishment. The news coverage and campaigns negatively affected the competitiveness of the Indonesian palm oil market (Rifin, 2010b). The policy paper argued that since palm oil productivity is higher than soybean and rapeseed, tariffs should not be imposed to improve its international competitiveness (Pratiwi, 2021; Rifin, 2010a).

The goal of ISPO creation

The policy paper states that the ISPO aimed to increase Indonesian palm oil competitiveness and its value-added. This direction came from the previous policy suggestions in the Oil Palm Road Map published in 2009 and 2010 (Road Map Kelapa Sawit). The roadmaps dealt with applying technology to palm oil cultivation, production, and derivatives. However, such attention to cultivation and production technology may not align well with recent changes in international markets that have affected Indonesian palm oil exports.

The policy paper suggested attaching the attribute of "sustainable" to Indonesian palm oil products through certification. Incorporating sustainability certification into government regulation should help to solve the state's environmental problem, promote Indonesian palm oil as a sustainable product, and advocate for applying the RSPO principle and criteria. A scheme similar to RSPO could generate economic, social, and environmental benefits. This scheme should be the new strategy for incorporating sustainability through policy alternatives (Table 3.3) as an added value, and it should lead the global palm oil market.

The plurality of ISPO creation

Multi-stakeholder involvement was visible when the paper identified policy alternatives to support the predetermined goal. Bappenas proposed eight policy alternatives (Table 3.3), summarized from government-held workshops on Strategic Environmental Studies (KLHS) and FGD. The policy report did not list workshops or mention FGD attendees. External stakeholders then ranked the eight policy alternatives according to their alignment with Indonesian palm oil development goals.

Table 3.3: List of policy alternatives supporting Indonesian Sustainable Palm Oil (ISPO)

Policy alternatives	Rank
Development of downstream industries and added values for palm oil	1
Transparency regarding palm oil plantation establishment information	2
Promotion, advocation, and public campaigning for the palm oil industry	3
Supporting RSPO principles and criteria	4
Development of a conflict resolution mechanism	5
Improving smallholders' access to information and funding	5
Strengthening and enforcing the ISPO and concession licensing management	6
Control the conversion of forest and peat land into palm oil land	7

Source: (Bappenas, 2010)

The invited stakeholders—including government bureaus (Bappenas and Directorate General for Plantation), a state university (IPB University), a state research body (Riset Perkebunan Nusantara), a palm oil producers association (GAPKI), and social and environmental NGOs—are considered important stakeholders in the state's palm oil production. While the policy paper did not specify specific companies, news outlets mentioned several large plantations, such as Government Palm Oil Plantations (PT Perkebunan Nusantara), Subsidiaries of SMART (SinarMas Group, Multinational), Sime Darby (Multinational), Astra Agro Lestari (Indonesia), Wilmar (Multinational), and Sampoerna (Indonesia). Large plantations were also involved in the ISPO field testing (Wijaya and Glasbergen, 2016). Further, it is unknown whether smallholder farmers were involved or which NGOs were invited.

Several issues related to multi-stakeholder involvement, especially those involving smallholders, were identified: conflict resolution mechanisms, access to information and funding, and focus on increasing palm oil products from smallholders. Access to funding was centered on subsidies or lowering the interest rate for the replanting and rejuvenation processes. Improvement in information access was discussed in terms of providing technical or organizational assistance to palm oil cultivators. The policy paper discussed a general approach to conflict resolution, such as public consultation. Previous research found that this approach did not facilitate balanced stakeholder negotiations (Hidayat et al., 2018).

The interactions during ISPO creation

The development of the ISPO consisted of discussions (strategic environmental assessments and KLHS workshops), pilot tests, FGDs, and finalization (Wijaya and Glasbergen, 2016; Bappenas, 2010). KLHS workshops are mandated by the Indonesian Law No. 23/2009 about Protection and Environmental Management. The workshops should include the participation of all relevant stakeholders. The pilot test included interactions between independent auditors, the government, and palm oil companies (Wijaya and Glasbergen, 2016). FGD served as a platform for creating policy alternatives and ranking them. There are no records of other interactions between stakeholders in the policy paper.

Operationalization of ISPO for environmental governance

The state's lack of operational capability in mobilizing the ISPO is reflected in the small number of certifications. Four years after the deployment of ISPO, 127 out of 763 plantations obtained the ISPO certificate. None of them were smallholders. Recently, two additional regulations were added to complement ISPO: the Decree of the Ministry of Agriculture No. 11/2015 and No. 38/2020. These regulations helped increase the number of certified plantations to 494. Among them, 14 were palm oil smallholder cooperatives (Lestari, 2021).

The small number of certifications accrued to two factors. First, it was deemed mandatory for select categories of palm oil establishments when the ISPO was established as a state regulation (Putri et al., 2022) (Observation #1). Second, the ISPO is ambiguous, confuses actors, and inhibits coordinated actions (Choiruzzad et al., 2021). The problem of operationalization is not necessarily related to the knowledge produced but the operational capabilities of the knowledge produced, namely the regulation infrastructure and palm oil industrial structure in Indonesia (Hidayat et al., 2018; Putri et al., 2022).

As a governance platform, the ISPO also has weak vertical coordination capacity, such as local government autonomy benefiting the local government's interest instead of local oil palm farmers (Hidayat et al., 2018). During the deployment of the ISPO, the lack of governmental resources hampered certification processes. Local governments had difficulties accessing ISPO-certified plantations. The ISPO commission also did not have enough authority to enforce sanctions. Due to past decentralization policies, the authority instead belonged to local governments (either the governor, regents, or city mayor). Last, those in the European market doubted the credibility

of the ISPO.

3.3.2 Increasing Public Participation in Strengthening the ISPO Policy: Public Consultations for Presidential Decree No. 44/2020

The Indonesian government's lack of operational capability to mobilize ISPO initiated a second round of knowledge co-production activity. This time, the process aims for increased public participation. In a letter from the Coordinating Ministry for Economic Affairs, 54/2016, the Indonesian government established a strengthening team for the ISPO certification system. This team was comprised of members of government agencies (e.g., representatives from the Ministry of Agriculture, Ministry of Environment and Forestry, and Coordinating Ministry for Economic Affairs), certification institute (Lembaga Ekolabel Indonesia), and NGOs (e.g., ISPO Alliance [ASLI], KEHATI Foundation, Kaoem Telapak, and Sustainable Palm Oil Development Forum). The invited non-governmental team members had participated in previous cooperative initiatives with national, regional, and local government agencies. These organizations also have experience managing public consultations (Observation #2).

The context of ISPO strengthening

The ISPO's strengthening focus is on four general issues (Table 3.4). Few are similar to the initial ISPO, namely economic and social, while others are aligned with the observable issues voiced by academia and NGOs. In addition, instead of focusing on technology to pursue productivity, ISPO strengthening was focusing on regulatory governance to fix the small number of ISPO-certified plantations and illegal and unsustainable practices that were deemed prevalent. The main stakeholders are similar, including smallholders and private plantations, with the addition of active involvement of NGOs in every issue. In addition to the perspective of government and academia, the strengthening team was tasked with obtaining remaining issues and feedback from the public on the ISPO certification system (Bakhtiar et al., 2018).

Table 3.4: List of issues related to strengthening the Indonesian Sustainable Palm Oil (ISPO)

Issue Category	Related Stakeholders	Issues
Economy	Smallholders, private plantations, NGOs	• Market acceptance of sustainably grown palm oil
Social aspects of local farmers	Smallholders, private plantations, palm oil associations, NGOs	• The prosperity of smallholder producers
Environment	Smallholders, private plantations, local governments, NGOs	• Palm oil plantation expansion
Governance	Smallholders, private plantations, local governments, central governments, NGOs	• Small number of ISPO-certified plantations • Illegality and unsustainable practices

Source: Author (Observation #1; Observation #2)

The goal of ISPO strengthening

ISPO strengthening aimed to create a new ISPO certification standard through a presidential regulation, with more governing power than a ministerial decree. In addition, to improve ISPO governance, the ISPO Commission organization's membership, duty, and function were rearranged to promote open participation and accountability. The new ISPO also includes the National Accreditation Committee (Komite Akreditasi Nasional) to improve the transparency of ISPO certification (Observation #1). These changes were obtained from the results of public consultations. Members of the strengthening team discussed the contents and context of the public feedback before finalizing it as Presidential Decree No. 44/2020 (Observation #2).

The plurality of ISPO strengthening

Multiple stakeholders were involved in separate activities throughout the strengthening process from 2017 - 2020. While not exhaustive, the participants below are obtained from interviews (Observation #1; Observation #2) and listed to provide a multi-stakeholder perspective. The related Indonesian government ministries were the Ministry of Agriculture, Minister of Environment and Forestry, Ministry of Agrarian Affairs and Spatial Planning, and Coordinating Ministry for Economic Affairs. Industries such as the subsidiaries of SMART were also involved.

In addition, there were around 15 Indonesian NGOs and palm oil associations, such as the Palm Oil Farmers Union, KEHATI Foundation, Indonesian Ecolabelling Institute, and Greenpeace Indonesia. Some NGOs actively advocated various environmental issues in Indonesia, such as Forest Watch Indonesia and Independent Forestry Monitoring Network (JPIK). Around 15 regional NGOs also facilitated public discussion in each of the representative provinces with palm oil plantations in Indonesia (Table 3.5).

Table 3.5: List of regional NGOs involved in strengthening the Indonesian Sustainable Palm Oil (ISPO)

Region	NGOs
Sumatera	Uno Itam, Lembaga Tiga Beradik, GeRak Aceh, MATA Aceh, Yayasan Peduli Nanggroe Atjeh (PeNA), Jikalahari
Kalimantan	Padi Indonesia, Stabil Kalimantan Timur, Perkumpulan Bantuan Hukum Kalimantan, GRID Kalimantan Barat, LPMA Borneo
Sulawesi	Evergreen, JAPESDA Gorontalo, Komnasdesa Sultra
Papua	Jasoil

Source: Author (Observation #1; Observation #2)

The interactions during ISPO strengthening

The interactions can be categorized into three types: high-level interactions between NGOs and government, middle-level interactions between NGOs, and low-level interactions between NGOs and palm oil smallholders. Compared to the interaction during ISPO creation, the strengthening of ISPO partly involves more stakeholders from NGOs and smallholders and relevant stakeholders such as government ministries and private palm oil plantations. However, the interactions observed (Table 3.6) are not exhaustive and listed to provide multi-stakeholder involvement and interaction (Observation #1; Observation #2).

Table 3.6: Interactions in strengthening the Indonesian Sustainable Palm Oil (ISPO)

Interaction level	Related stakeholders	Interaction examples
High	Government, private plantations, NGOs, palm oil associations	• Workshops • Public consultation
Middle	NGOs, local government, palm oil associations	• Regional public discussions • Press releases
Low	Smallholders, private plantations, local governments, NGOs	• Pilot projects • Information dissemination • Technical assistances

Source: Author (Observation #1; Observation #2)

Notable interactions during the ISPO strengthening were the middle-level ones where public consultations were arranged in 5 different locations nationally with the cooperation of NGOs utilizing their existing civil society networks and infrastructure. The feedback from public consultations was obtained in writing and collected by the cooperating NGOs. Further, to support the goal of reducing illegal plantation and unsustainable practices, there were active technical assistance and pilot projects from NGOs such as KEHATI Foundation, such as obtaining ground-level data on smallholder palm oil farmers and plantations to map and register smallholder plantations and introducing alternative palm oil cultivation pattern "Jangka Benah" (Observation #1).

Operationalization of ISPO for environmental governance after the strengthening

Although the new presidential decree to strengthen ISPO has started since 2020, the decree also mandated a five-year preparation period for related stakeholders. Considering the preparation period, this research cannot observe the operationalization of ISPO for environmental governance in Indonesia. However, a separate report from the UK Foreign, Commonwealth, and Development Office (FCDO) (FCDO, 2022) highlighted that the dialogue and pilot projects have "increased the legality of palm oil plantations owned by smallholders, introducing a scheme to solve palm oil in forest areas." In addition, the government of Indonesia has recently funded the ISPO and is developing a plan to institutionalize the ISPO strengthening program further. The FCDO report also noted that the Ministry of Agriculture had limited functional and staffing capacity to establish a new ISPO Certification

System.

3.4 Discussion

The initial policy creation process resulted in a policy lacking operational capability, while the second involved increased public participation. According to Knowledge Co-Production (KCP) principles, these policies differ in context, goals, and participating actors. The interaction to strengthen the Indonesian Sustainable Palm Oil (ISPO) certification included public consultation and establishing a civil society network for monitoring and evaluation (Table 4.1). These efforts represent recurring instances of knowledge co-production activity.

Table 3.7: Comparison of the Initial ISPO policy and the ISPO strengthening activity as a KCP

Principles of KCP	**The applications in the ISPO case**	
	Initial ISPO	**Strengthening ISPO**
Context	Decreasing international competitiveness, low productivity for farmers with limited access to funding and seeds, the productivity gap between plantations and smallholders, and forest conversion	The doubted credibility about ISPO and certification impact towards environmental impact, lack of adoption, standard credibility
Plurality	Government bureaus, state universities, palm oil producers associations, social and environmental NGOs	Government ministries, NGOs, public (smallholders) representatives
Goal	To increase Indonesian palm oil competitiveness and its value-added sustainably	The issuance of the new ISPO standard
Interaction	Discussions and workshops, pilot tests, FGDs	Public consultations, discussions and dialogue, pilot projects, and establishing civil society network for monitoring and evaluation

Source: Author

The creation of the ISPO policy illustrates a recurring Knowledge Co-Production Process (KCP). Iterative processes in KCP are not new and have

been exemplified in various studies. Including iterative processes as a conscious KCP design can help identify and address power dynamics and biases influencing decision-making processes (Phillips et al., 2021).

The first effort in co-producing knowledge mirrored a process dominated by the government or government bureaus to advance the state's agenda of promoting Indonesian palm oil products. This dominance was evident in the government-led context and the goal of the activity. The initial ISPO process involved diverse, powerful, or incumbent actors in the Indonesian palm oil landscape. The context and goal echoed the government's economic development agenda. The initial ISPO process encountered barriers to knowledge co-production highlighted in previous studies, where historical and dominant contexts shape power dynamics and participation in decision-making processes (Miller and Nadeau, 2017; Lavorel et al., 2019).

The second effort in co-producing knowledge differed in goals, context, participating key actors, and interactions. Faced with operational capability challenges and international credibility concerns, the government changed its perception, leading to a new round of policy improvement to strengthen ISPO. Unlike the previous round, there was publicly documented involvement of NGOs, establishing civil society networks for public consultation, and a call for public input in several regions through consultations. The shift in actor configuration brought additional insights to the discussion.

Exploring the origin of knowledge and its relationship to the transformation process reveals that incumbent knowledge origins combined with non-contested actor configurations may echo incumbent agendas. In the initial ISPO case, knowledge produced in this manner resulted in ineffective policy operationalization. Despite the existing regulation mandating workshops and FGDs to facilitate knowledge co-production, this process was dominated by powerful, incumbent knowledge in the palm oil industry. This knowledge came from government bureaus (Bappenas and Directorate General for Plantation), a state university (IPB University), a state research body (Riset Perkebunan Nusantara), a palm oil producers association (GAPKI), and social and environmental NGOs. The policy paper, knowledge created during this process, is then used for sensemaking by powerful actors to understand the increasing scrutiny against palm oil products. The understanding obtained through the sensemaking then continued through the envisioning of ISPO to attach the attribute of "sustainable" to Indonesian palm oil products through certification. Incorporating sustainability certification into government regulation discussed the state's environmental problem, how to promote Indonesian palm oil as a sustainable product, and advocated for applying the RSPO principle and criteria.

Subsequent knowledge origins shifted towards a more diverse actor con-

figuration after the incumbent actor changed perspectives due to external shocks and partnered with key actors with active civil society networks. However, the outcome of operationalization for the new policy remains to be discovered. The case study was partly taken from the "Strengthening Palm Oil Sustainability in Indonesia" project that was a continuation of the Revamping ISPO and was funded partially by the Foreign, Commonwealth and Development Office (FCDO) of the United Kingdom. By the time the research was conducted, the project was undergoing completion. Based on the recent annual review of the ISPO strengthening program, there are extended from the second knowledge co-production process.

While the overall result of the ISPO strengthening program is yet to be seen, the latest report provided a rather positive outlook towards the future impact of the program with barriers in the capacity of the Ministry of Agriculture to establish a new sustainable certification system. Previous literature on knowledge as a leverage point and sustainable transformation provided insights that while knowledge is key to transformation, knowledge dissemination through agents of change was perceived as equally important (Bryant and Thomson, 2021). In the case of ISPO strengthening, SPOSI may have taken the role of agents of change and disseminating agents. SPOSI has published 14 policy briefs/papers disseminated through their website, developed a new practice (Jangka Benah), and helped to disseminate the practice through agroforestry demonstration plots.

The role of SPOSI in networking with several government actors at national and local levels, embedding "Jangka Benah" at the national level through institutionalizing it in the national regulations, developing the pilots for regional action plans for sustainable palm oil, and being involved in demonstration plots of agroforestry also supported the previous observation of interventions in multiple leverage points (Lam et al., 2021). However, this ability is only available to certain actors that are central enough among the stakeholders interacting with the leverage points (Lam et al., 2021; Andriamihaja et al., 2021; Bolton, 2022).

While it is unclear if the ISPO strengthening effort was a conscious call for active public experimentation, the results support the argument to include iterative processes as a conscious KCP design. The Indonesian government has published and revised ISPO several times to cope with external pressure while maintaining its agenda of pursuing economic development through palm oil production. It took five years of problematic operationalization and multiple external pressures before the government had a change in perception. A conscious iterative design, on top of involving multiple stakeholders, can save time and policy execution effort.

The barrier SPOSI experienced may be related to the need for more

shallow leverages or concrete actions related to the stakeholders in the Ministry of Agriculture of Indonesia. For example, the intervention projects in Colombia provided insights into projects that only targeted deep leverage by leveraging local knowledge to have higher transformative potential. However, these projects often met with implementation barriers, requiring additional concrete steps. Projects coupling deep and shallow leverages utilizing local knowledge with more concrete actions have better implementation and execution (Burgos-Ayala et al., 2020).

The involvement of NGOs played a crucial role. They built rapport with the government, gained trust as partners, and utilized existing civil society networks to obtain relevant public input for strengthening ISPO policy. This partnership resulted in revised practices embedded within the new regulation. NGOs acted as transformative agencies to foster policy innovation while collaborating with the government (Huber-Stearns et al., 2017; Westley et al., 2013; DeCaro and Stokes, 2013). The positive outlook regarding the strengthening program and the success of embedding Jangka Benah at the national level policy may also help drive sustainable transformation. A case in Ethiopia and South Africa showed that changes that started in formal structures, such as policy or regulation, may also influence the deeper leverage leading to transformation (Manlosa et al., 2019; Rölfer et al., 2022).

3.5 Conclusion

This chapter embarked on an exploration of the origin of knowledge and transformation processes in land governance. The research question guiding the inquiry was: How does the origin of knowledge affect the transformation process? This chapter revealed that the origin of knowledge plays a pivotal role in shaping the trajectory of transformation processes in land governance. Specifically, this chapter identified recurring instances of knowledge co-production activities while creating the Indonesian Sustainable Palm Oil (ISPO) certification policy processes. In the initial phase, characterized by government-dominated knowledge production, the agenda was primarily driven by incumbent actors with vested interests in developing the Indonesian economy through Indonesian palm oil products. However, this approach resulted in ineffective policy operationalization, highlighting the limitations of historical and dominant contexts that shape power dynamics and participation in decision-making processes.

In contrast, the subsequent iteration witnessed a shift towards a more inclusive knowledge co-production process, spurred by external pressures and a change in government perception. This phase saw the active involvement of

non-governmental organizations (NGOs) and civil society networks in policy improvement efforts, leading to enhanced public participation and a more inclusive public hearing to listen to stakeholder perspectives. The collaboration between NGOs and their civil society networks emerged as a transformative force, facilitating policy innovation and fostering a more multi-stakeholder decision-making process.

The findings of this chapter underscore the importance of having a multi-stakeholder knowledge co-production involving actors with transformative agencies to foster transformation in land governance. By recognizing the influence of knowledge origin on transformation processes, policymakers, and stakeholders can work towards more inclusive and effective governance frameworks. As demonstrated in the ISPO case study, the iterative nature of knowledge co-production emphasizes the need for a conscious design instead of a trial-and-error approach compounded with diverse stakeholders to address power dynamics and biases inherent in decision-making processes. Further, non-government actors can make the process more collaborative by benefiting from their civil society networks and connecting stakeholders with diverse interests.

This chapter underscores two major empirical limitations of the study. First, the implementation of the ISPO policy after strengthening is incomplete. The absence of a fully implemented ISPO policy made it difficult to empirically observe how knowledge origins affect the transformation process. Second, the data used to construct the case study were unable to obtain triangulated data, resulting in an unintentional non-convergence of evidence, where different sources of information address different part of the case study. A robust case study ideally utilizes multiple sources of evidence, combining documentation, archival records, interviews, direct observations, and physical artifacts to triangulate and strengthen validity. This chapter relied on documentation and interviews to construct the case study. However, the limited amount of available documentation and the feasible number of interviews resulted in non-convergence of evidence. Chapter 5 will discuss these limitations and the implications of the overall outcome of this dissertation.

Chapter 4

Exploring Triggers and Leverage in Land Governance

4.1 Introduction

As briefly argued in Chapter 1, path dependency in land governance can equate to unsustainable control of land, shaping livelihoods and people's well-being (Doyon et al., 2021; Goldstein et al., 2023; Wittman and James, 2022). Path dependencies can also manifest in decision-making structures, division of roles, expertise, knowledge, and resource dependencies within governance networks (Beunen et al., 2020). For example, in Swedish commercial fisheries, the long-term involvement of the government and the establishment of exclusive harvesting rights have led to alternative stable states (Hentati-Sundberg et al., 2019). Further, in the Brazilian Amazon, the environmental registry program has led landholders to perceive it as a step towards future land titling, indicating a path-dependent mindset where expectations of future outcomes influence current actions (L'Roe et al., 2016)

A recent multi-disciplinary review of the path dependency concept called for a more structured analysis that considers the multiple sources of path dependency, such as its spatial, temporal, or structural scales, to highlight opportunities for path-breaking attempts (Goldstein et al., 2023). For land governance, it may mean not only taking into account the intersection of policies, processes, and institutions on access, use, and interest in land and resources (Palmer et al., 2009) but also considering the involved actors, their network, and the interventions required for path-breaking attempts (Andriamihaja et al., 2021; Abson et al., 2017). Analyzing governance as a system may provide insights into the causality of land governance, especially about interventions that focus on specific timing or structures to make changes

possible.

To explore the causality and strategic intervention in land governance, this chapter will focus on the 3rd phase of the morphogenetic cycle (Figure 2.2). Using the leverage point for sustainability transformation as a lens, this chapter explores how the transformation began and how knowledge serves as a leverage point in steering the transformation trajectory. This chapter will examine the dynamics of transformation in land governance by asking two questions: 'How does the land governance system transform?' and 'How do leverage points, specifically knowledge, influence the land governance transformation trajectory?' To answer these questions, this chapter explores the previous studies on deliberate governance change in general and land governance change. The exploration is done using a systematic literature search. The nature of the exploration is descriptive to synthesize a textual narrative (Xiao and Watson, 2019).

4.2 Methodology

4.2.1 Systematic Literature Search

While the Google and Google Scholar combination is known to perform the best, especially for open access coverage and gray literature (Xiao and Watson, 2019), this chapter considers excluding them to enable the exploration to focus on peer-reviewed academic articles and book chapters written in English. This chapter explored the two largest academic research electronic databases, Scopus and Web of Science (WoS), using the combinations of keywords listed in Table 4.1 below. The search covered published literature up to July 2022. The literature search yielded 186 articles from Scopus and 86 from WoS, excluding duplicates.

Table 4.1: Scopus search parameter for systematic literature search

Keywords and syntax combination	Subject area
"deliberate" AND "governance" AND ("change" OR "transformation") AND ("structure" OR "regime")	environmental science (ENVI), social sciences (SOCI), agriculture (AGRI), economics (ECON), energy (ENER), business and management (BUSI), and earth and planetary science (EART)
"land" w/2 "governance" AND "change" AND ("structure" OR "regime")	
Continued on next page	

Table 4.1 – continued from previous page

Keywords and syntax combination	Subject area
"deliberate" AND "governance" AND ("change" OR "transformation") AND ("structure" OR "regime")	All databases (TS)
"land" NEAR/2 "governance" AND "change" AND ("structure" OR "regime")	

Note: The proximity operators (Scopus: "w/2"; WoS: "NEAR/2") are used to find records where the terms joined by the operator are within two words of each other. The Boolean operator "AND" finds records with all terms specified through the keywords. The operator "OR" finds records containing any of the keywords specified.

The complete flow of the literature search is shown in Figure 4.1. In reviewing the literature, duplicates are screened before deciding to include or exclude the literature for analysis. The screening resulted in 208 articles for further screening and 64 duplicates. The 208 articles are then screened based on their titles and abstracts. Following the systematic literature review guidance, especially relative to the research question of this chapter (Xiao and Watson, 2019). The abstracts or the full text of the reviewed literature have to be able to answer at least one of the research question elements. The screening resulted in 15 articles for analysis.

The literature search is limited to peer-reviewed articles and book chapters, which points to the limitations of this research. This limitation may insufficiently capture the complexities of land governance change. A complete list of 15 articles about land governance literature is available in Appendix A.1.

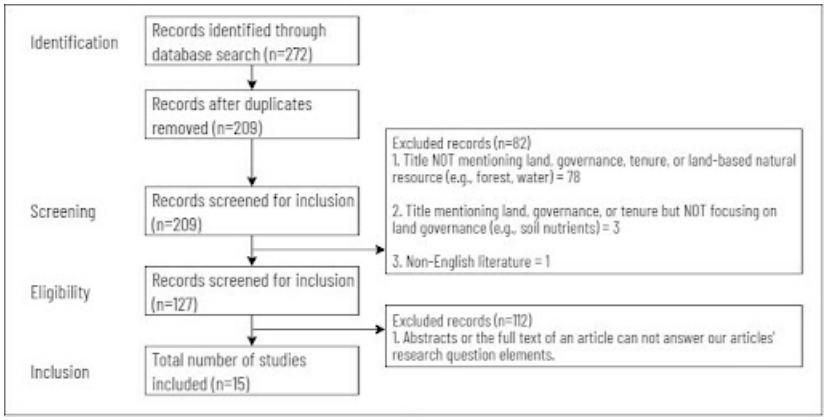

Figure 4.1: Literature search and evaluation for inclusion flow

4.2.2 Analyzing the Triggers and Leverage in Land Governance

This chapter uses the concept of 'when', 'where', 'how', and 'who' in analyzing the land governance literature. These concepts are derived from the relevant literature on sustainable transformations, notably the concept of leverage points for sustainable transformation (Abson et al., 2017; Meadows, 1999). 'When' is a shorthand for triggers, 'where' is for leverage, 'who' is for actors, and 'how' is for their agency. Leverage points provide a conceptual place to poke, jump, and start a systemic transformation. Shallow leverage points involve parameters such as taxes and incentives, while deep leverage points are more difficult to influence but can lead to substantial change (Abson et al., 2017). System transformations are also related to temporal elements (i.e., shocks or triggers) (Fischer et al., 2022; Moore et al., 2014). These triggers can create windows of opportunity and critical junctures that, when seized, can lead to a turning point and change (Geels et al., 2017; Olsson and Galaz, 2012). Seizing the windows of opportunity is the job of agents of change. They are actors with particular aims, resources, and networks (Andriamihaja et al., 2021). These actors can do transformative agency, conscious actions with a certain intended goal (Westley et al., 2013; Moore et al., 2014).

Literature on land governance change combined actors and agencies to understand a few possible configurations for sustainable land governance. They identified that actors with predominantly economic aims tend to have high access to resources and better social networks (e.g., state representatives and cash crop intermediaries). On the contrary, actors with social aims tend to have low access to resources and worse social networks (e.g., farmers and local associations). Actors with environmental aims tend to have access to physical resources (international NGOs, conservation NGOs) (Andriamihaja et al., 2021). Actors with predominantly economic aims are targets for transformation actions due to better access to economic and social resources. However, relying on an actor-centric approach leaves out the details of agency and institutional configuration (Westley et al., 2013; Smith and Raven, 2012; Olsson and Galaz, 2012).

Literature on agency discussed three types of strategic agency for change: sensemaking, envisioning, and gathering momentum, regardless of what they aim for (Moore et al., 2014; Westley et al., 2013). Figure 4.2 illustrates how

the strategic agencies fit into the concepts of systemic change described in Chapter 2 (Figure 2.2). Sensemaking agencies actively analyze the current problem and assert their interpretation of a problem (Westley et al., 2013; Rip and Kemp, 1998). Sensemaking can also be an action in which key actors create common stories and purposes to motivate action). Envisioning involves figuring out alternative pathways for alternative solutions. It often involves scenario planning or other participatory processes (Moore et al., 2014). Gathering momentum is an action to move the system towards the vision created in the envisioning process, typically by forming a coalition of supporters (Moore et al., 2014). Gathering momentum also works as a self-organization mechanism to amass power (Dorninger et al., 2020; Meadows, 1999).

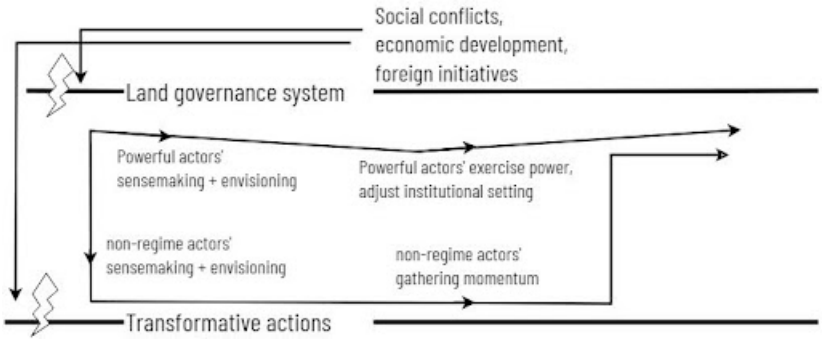

Figure 4.2: Illustration of landscape shocks triggers strategic agencies

Note: The illustration was made according to the concepts in Chapter 2. Thunders represent landscape shocks. Arrowheads represent agencies enacted by actors.

4.3 Result

4.3.1 Triggers, agency, and actors

During the release and reorganization phases, the old institutional arrangements lose dominance and new understandings emerge about how a problem or crisis should be understood (Westley et al., 2013). The literature on land governance change provides evidence that actors utilize sensemaking agency and try to understand their existing problems during such times. Some actors can influence systemic change by gathering momentum (network and collaboration) and bridging their vision to a larger scale. In comparison, some other actors are powerful enough to impose their vision on a broader

scale.

There are several triggers in the current literature on land governance. Most of the triggers came from social conflicts and economic development (Zhang et al., 2021; Varkkey, 2020; Lundsgaard-Hansen et al., 2018; Zhong et al., 2014; Ansoms et al., 2014; Bollens, 1993). Sometimes, triggers are social conflicts and foreign initiatives' direct or indirect influence (Akolgo-Azupogo et al., 2021; Ónega-López et al., 2010). Foreign initiatives directly influence land governance through land titling programs (Musinguzi et al., 2021; Boutthavong et al., 2016; Biitir and Nara, 2016), whereas indirectly through REDD+ or other forest carbon initiatives (Robiglio et al., 2014; Higgins et al., 2014; Cenamo and Carrero, 2012).

Sensemaking

Triggers create crises that result in society changing opinion about the current structural arrangement or having unsolved problems. Some actors try to understand their existing problems through sensemaking (Westley et al., 2013). Examples of sensemaking include farmers from Galicia, Spain (Ónega-López et al., 2010; Tubío-Sánchez et al., 2013), and Nongnong Project, China (Zhang et al., 2021), who developed the 'increasing farm cost and related labor' to reason with the increase in land parcels with different owners. Some rural landowners and international NGOs in Apui thought that deforestation is caused by farmers claiming land titles and turning over their lands to other owners (Cenamo and Carrero, 2012). Farmers in certain African marshes had difficulty finding land to cultivate food, and the problem was narrowed down to customary leaders' land allocation (Ansoms et al., 2014). Clan leaders in Ghana believed that 'the growing practice of land governance violates traditional practice' as land rent and distribution practices changed (Biitir and Nara, 2016).

Powerful actors such as customary leaders and governments also do sensemaking, although it can be different with less-powerful actors. Such sensemaking is visible in separate cases in the land governance literature. The US government was concerned with increasing congestion and housing and narrowed the cause to decrease the control of local land allocation (Bollens, 1993). Increasing urbanization and industrialization in China threatened farm preservation. To prevent further threats, the government must prevent illegal farm conversion (Zhong et al., 2014). The Malaysian government sees an increasing increase in global palm oil consumption, while it does not produce as much palm oil as its competitor (Varkkey, 2020).

Envisioning

Envisioning in land governance literature follows a rather linear path from sensemaking, regardless of the actors. Envisioning follows the problem understanding from sensemaking. Actors used envisioning and devised alternative solutions to solve the existing problems (Westley et al., 2013). For example, reallocating land to create larger parcels to increase efficiency as costs increased (Zhang et al., 2021; Ónega-López et al., 2010). Clan leaders in Ghana created an institution to record land ownership to counter changing land distribution practices (Biitir and Nara, 2016). a local NGO bundled the REDD+ economic benefits agreement with a land titling mechanism to prevent land turnover (Cenamo and Carrero, 2012). Powerful actors such as the US government created new financing and development agencies to intervene in the decrease in local land control (Bollens, 1993). The Chinese government improved its surveillance by including additional remote sensing data to counteract illegal farm conversion (Zhong et al., 2014). The Malaysian government utilized idle ancestral land to increase palm oil production (Varkkey, 2020).

Gathering momentum

There are two types of changes: with and without gathering momentum. Local community members, leaders, and organizations are involved in changes, gathering momentum. Often, it is accompanied by transnational organizations, NGOs, and governments. The agency of gathering momentum bridges the result of sensemaking and vision that actors have done toward a goal or a problem (Lundsgaard-Hansen et al., 2018; Moore et al., 2014; Westley et al., 2013) to a larger scale. For example, sharing and discussing in a farmer community to socialize changes in practice (Ónega-López et al., 2010), communicating with governmental departments (Lundsgaard-Hansen et al., 2018), or spreading information and resolving conflicts (Zhang et al., 2021). The network built from the gathering momentum agency is important for change (Westley et al., 2013; Moore et al., 2014; Andriamihaja et al., 2021).

Gathering momentum agency for land governance change is more likely to be observed where a bottom-up relation is built. Case studies from Galicia, Spain, and one from the Nongnong Project, China, provided evidence that farmers and landowners held community meetings to advance their vision and resolve conflict by discussing new land governance mechanisms (Ónega-López et al., 2010; Zhang et al., 2021). In these cases, other farmers disagreed about the solutions. Community meetings were held to increase participation and resolve conflicts. The community meetings resulted in greater adoption and

legitimacy of proposed new land governance mechanisms. Both cases were self-organized movements. They highlighted the exclusion of government entities or market mechanisms during the community meetings (Ónega-López et al., 2010; Zhang et al., 2021). However, there was government involvement in duplicating the community solution to other locations, diffusing it with the help of additional incentives such as financial incentives and technical support (Zhang et al., 2021). In some cases, the government may exercise gathering momentum, as seen in colonizing customs lands in palm oil in Malaysia (Varkkey, 2020).

Conversely, changes without gathering momentum coincide with government-dominant involvement or top-down relations. Powerful actors often exercise power through regulatory or institutional changes toward a goal or problem to bridge the incumbent sensemaking and vision. For example, to improve land rights management, the Laos government rezoned and formalized land tenure through land titling (Boutthavong et al., 2016) or increased surveillance activity through additional GIS-based information in China and Laos (Boutthavong et al., 2016; Zhong et al., 2014).

From observing the triggers on land governance change, most of the cases happened related to external triggers such as changes in socio-economic conditions (Bollens, 1993; Zhong et al., 2014; Varkkey, 2020; Zhang et al., 2021), biophysical changes (especially land uses) (Ónega-López et al., 2010; Zhong et al., 2014). Few cases were related to changes in the regulation (Varkkey, 2020; Boutthavong et al., 2016). Previous literature on land governance change argued that the external or internal triggers are why transformation happens (Andriamihaja et al., 2021). The literature implies that the agency of change in land governance literature did not happen until certain triggers destabilized the incumbent land governance instead. External or internal triggers are not the reason a change needs to happen. External or internal triggers coupled with strategic agencies are the cause of transformation in land governance.

4.3.2 Leverage, agency, and actors in land governance change

The places for interventions (leverage points) vary depending on the difficulty and their potential impact (Abson et al., 2017; Fischer and Riechers, 2019). There are four places to intervene: parameters, feedback, designs, and intents (Table 4.2). The parameters have modifiable mechanistic characteristics, such as the number of participants in certain initiatives, the average consumption of car fuels, or the amount of land the government regulated for

communal use (Fischer and Riechers, 2019; Meadows, 1999; Riechers et al., 2021). While it is possible, parameter changes alone rarely kick-start systemic changes (Abson et al., 2017; Meadows, 1999).

Table 4.2: Relationship between four realms of leverages, the twelve systemic leverage points, and examples for the land governance context.

Leverages	Leverage points	Examples from land governance literature
Parameters	Constants, parameters, numbers	Average minimum areas for land (re)distribution or reforestation
	Size of buffer stocks, relative to flows	Lands available to govern
	Structure of material stocks and flows	
Feedbacks	Length of delays, relative to the rate of system change	Time required for access/use/interest changes on a particular land
	Strength of negative feedback loops	Frequency of land access/use/interest report and monitoring, land taxes
	Gain around positive feedback loops	Increase in population, changes in land access/use/interest, land aggregation allowance
Design	Structure of information flows	Information about land ownership (open/limited/proprietary)
	Rules of the system (incentives, constraints)	Land governance that is managed with spatial and environmental awareness, purposeful, and just
	Power to change the system structure or self-organize	The ability of a group of land-owner to establish alternative rules for land (re)distribution
Intent	The goal of the system	Growth-focused land governance, pro-poor land governance

Continued on next page

Table 4.2 – continued from previous page

Leverages	Leverage points	Examples from land governance literature
	Paradigm underpinning the system	Social norms and values influencing land access/use/interest
	Power to transcend the paradigm	Acceptance of alternatives to the existing land governance exists and is doable

Source: (Abson et al., 2017), (Meadows, 1999)

Parameters are the modifiable, mechanistic settings or conditions determining a system's operation (Meadows, 1999). Interventions concerned with the system parameters are commonly related to technological or economic problem framing (Dorninger et al., 2020). It can be the carbon price or the classification of air quality standards (Meadows, 1999; Abson et al., 2017). Examples of parameters in land governance literature include the size of agriculture land parcel (Ónega-López et al., 2010), allowable planted crop type (Ansoms et al., 2014), or minimum area to reforest (Cenamo and Carrero, 2012).

Feedback focuses on the system's internal dynamics to maintain a certain goal. The strength of the negative feedback loop helps keep the system on point. Such as fees and taxes to recapture externalized public costs (Meadows, 1999). A positive feedback loop can drive growth. For example, the growth of meat consumption benefits cattle farming. However, uncontrolled gain around positive feedback loops tends to drive the system to implode and lead to chaos (Meadows, 1999). In the land governance literature, feedback leverage is observable as the permanent allocation of consolidated marshland plots for farming purposes (Ansoms et al., 2014), the cooperative or intermediaries to maintain available agricultural land parcels to be cultivated (Ónega-López et al., 2010; Ansoms et al., 2014), or the contract to ensure reforestation activity (Cenamo and Carrero, 2012).

Design and intent leverages are categorized as deep leverage points more likely to cause systemic changes (Abson et al., 2017; Meadows, 1999). The system's design comprises the structure of information flow, rules of the system, and power characteristics (Dorninger et al., 2020). Changing the design alters the flow of information and power, resulting in a change in governance. In the land governance literature, examples of design leverages were observable as the changing the regulation to add information such as spatial coordinates, landowners on illegal land clearing, or available lands to the

public may lead to how people access, use, and manage land (Boutthavong et al., 2016; Zhong et al., 2014; Moss, 2004).

The system's intent is about the system's goal, and the background paradigm of the goal is constructed or changed (Abson et al., 2017). As leverage, intents such as goals and paradigms are superior for systemic changes compared to other leverages (Meadows, 1999). Goals in smaller existing systems, such as land accumulation or distribution, can be apparent. However, some broader systems goals are less obvious and need to be analyzed to understand what the system does. Broader goals include the broader narrative of sustainable transformation or just land governance (Köhler et al., 2019; Meadows, 1999; Singh, 2009). These goals are assumed to be constructed by the existing values behind them. The shared values and ideas within society are about how the world works (Meadows, 1999; Schmidt, 2009). For example, customary norms of land governance may distribute the right of access and use of lands equally among the community members, albeit limited to a certain gender. Such norms can change through colonization. Over time, land governance values social ranks more and creates inequality in land access and use (Doyon et al., 2021).

4.4 Discussion

In the land governance literature, changes dominated by powerful actors, such as governments, could design and utilize leverage to make changes related to the structure of information flows and rules. For example, the state intervened to address the declining local economic growth and established an intergovernmental structure in the United States' land governance. This change changed the authority of land governance to the state and regional levels (Bollens, 1993). The government changed the rules and governance structure for land inspection in China. They added satellite images to find illegal farmland conversion. The addition of remote sensing imagery increased the type of information that the government could analyze and reduced illegal farmland conversion (Zhong et al., 2014). The government changed the rules and information flow within the country's land governance in Lao PDR through the land titling program. They added land registration to help with the land tax system, added GIS as a source of information, and reorganized agricultural land zoning for individual households (Boutthavong et al., 2016).

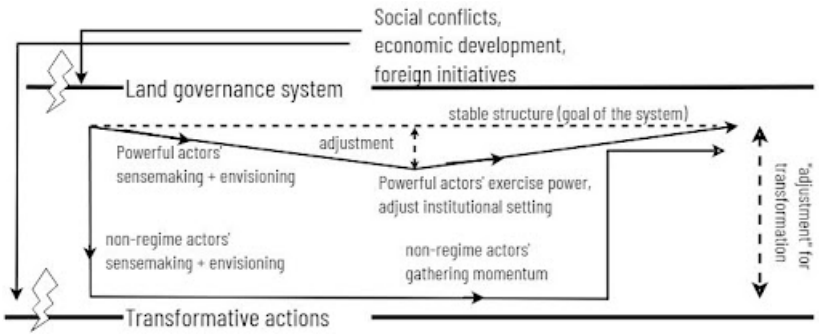

Figure 4.3: Illustration of leverage required to adjust vs to transform

Note: The illustration follows the concept from Chapter 2. Thunders represent landscape shocks. Arrowheads represent agencies enacted by actors. The dashed line represents a stable structure. Dashed lines with arrows represent leverage needed for adjustment or transformation.

Figure 4.2 illustrates the leverage required to adjust compared to transform, aligned with the concepts from Chapter 2 (Figure 2.2). Shallow leverage points can be enough for shallow adjustment, but deep transformation requires accessing deep leverage points (Abson et al., 2017). Transformative actors use leverage differently to dominate the change processes. For example, five farmers' households act as transformative farmers to deal with increasing labor costs and land fragmentation in China. They sensed a problem, conceived a solution, and used their resources to create a land redistribution pilot project. These five farmers' households were "chief decision-makers throughout the project." (Zhang et al., 2021). They utilized parameters in the form of incentives as leverage. Farmers who joined the land reallocation project were allowed to access beneficial infrastructure. Those who did not were not allowed. Next, the transformative farmers utilized feedback through pilot project demonstration to ensure that their program is beneficial and provides desired outcomes. Last, the transformative farmers utilized design leverage to self-organize and change the power distribution. They use village cadres as leaders and authoritative figures to resolve land conflicts.

Land governance change literature provided evidence on how leverages change actors' agency. The case of land use trajectories in Myanmar provided detailed pictures of powerful actors utilizing leverage differently than less-powerful actors. Natural Reserve Park (NRP) was established in Myanmar to establish a natural reserve in a reserved forest-designated area. This action also moves the overlapping customary land to the buffer zone so the locals can retain access to the land (Lundsgaard-Hansen et al., 2018). In

one scenario, the government established a Nature Reserve Park (NRP) on top of customary land without prior negotiation and set up NRP rangers' offices around the area. As a result, farmers and local communities in the area refrained from using the land. In this case, the government carries the sensemaking and vision agencies through the NRP program. The government uses the design leverage to enforce the rules and power over customary land through NRP rangers' deployment. In addition, an international NGO –collaborating with the government– helped bridge the sensemaking and vision of the government with the local community and established a buffer zone to replace now-protected customary lands. The government also employed design leverage to enforce rules and power over customary land, with additional information flow utilized by government-sponsored NGOs. Both cases resulted in top-down land governance change with slightly different results. The bridging by NGOs resulted in fewer conflicts, a better implementation of their NRP policies, and the local people retained access to a different land.

However, design and intent leverage do not always generate changes. The single case where changes are not observed (Biitir and Nara, 2016; Cenamo and Carrero, 2012) suggested a few key aspects of land governance change. First, from the agency perspective, actors (or agents of change) can be anyone (Andriamihaja et al., 2021; Moore et al., 2014). It is important to understand the actors' alignments, whether they are niche or incumbent actors. Incumbents may prolong pre-existing power imbalances, co-opt the triggers, and prevent transformation (Ansoms et al., 2014). Second, agencies and leverages are interrelated. Failure to gather momentum in mutual agreements align interests, or commitments among key actors leads to inefficient utilization of design leverage. This inefficiency can change some key actors into a barrier to change instead. In Ghana's case of land governance, the growing mistrust among tendamba (land-owning families) prevented land governance change (Biitir and Nara, 2016). In the case of Southern Amazonas, a "lack of commitment from public institutions" may have prevented the transformation (Cenamo and Carrero, 2012).

4.5 Conclusion

This chapter started with a review of the literature on land governance. The review revealed that most changes in land governance began with triggers, such as social conflicts and economic development, that resulted in crises. During these crises, actors engaged in sensemaking, envisioning, and took advantage of the leverages to bring about change. The review also found

that both transformative and incumbent actors could utilize some leverages to make changes related to the structure of information flows and rules. Still, they differ in the steps they must take to do so.

Chapter 5

Discussion: an analytical framework of land governance transformation

Literature in land governance change argued that linking could lead to transformative action. Linking actors with different resources and aims (such as economic, sustainable, or social) can change actors' aims while allowing other actors to access resources, such as the link between resourceful (network and physical), economic actors, to sustainable actors (Andriamihaja et al., 2021; Lundsgaard-Hansen et al., 2018). Connecting NGOs and local communities with governments can influence governments to shift their aims from economic to more sustainable. However, this argument assumes that actors with different aims can influence change regardless of power. The land governance change literature shows that actors' influence in the governance transformation varies depending on who takes advantage of the triggers (i.e., enacting agency on the triggers through leverages). When incumbents take advantage of the triggers through their agency, it influences the transformation direction (Ansoms et al., 2014; Varkkey, 2020). In a case of bottom-up changes (Zhang et al., 2021; Lundsgaard-Hansen et al., 2018), emergent actors (farmers and landowners) gather momentum to support their pilot project, a work of their vision, offering a new land governance mechanism in the face of triggers. In both cases, this dissertation saw networks between less resourceful actors with non-economic and resourceful actors with economic aims. The difference lies in who acted on the leverages. Analyzing actors, agencies, and leverages can provide contextual factors missing from the previous literature.

In analyzing actors, agencies, and leverages in land governance transition, this dissertation complemented the socio-ecological systems perspective with socio-technical systems and leverage for sustainable transformation to ana-

lyze the intricate interplay between knowledge, actors, and systemic change in land governance. By zooming in on the origin of knowledge and its relationship to the transformation process through a case study of Indonesian palm oil. Further, this dissertation looked at the broader picture of causality and strategic intervention, focusing on understanding how the transformation occurred and how the knowledge could influence the land governance transformation trajectory as leverage. This chapter will discuss the above points separately and converge to provide a holistic picture of how knowledge interacts with actors and agencies as leverage and influence land governance transformation. This chapter ends by providing a novel analytical framework and its application in analyzing land governance change.

5.1 Adapting different knowledge origins through knowledge co-production

The dissertation hypothesizes that landscape changes influence transformative actors' perceptions, leading certain actors to innovate or try to resolve problems caused by landscape changes. In more detail, the perception shifted due to the need to adapt by generating new skills or learning. What has been observed through the case of sustainable palm oil in Chapter 3 was recurring instances of knowledge co-production activities with different knowledge origins that resulted in different policy creation processes. This result shows that the origin of knowledge plays a pivotal role in shaping the trajectory of transformation processes in land governance. Two critical aspects are of focus: the shifting perception of actors due to landscape shocks enabling different knowledge origins and networked actors in influencing transformation trajectory.

The role of knowledge origin in influencing transformation trajectory can be observed through the change of ISPO policy creation processes. In Chapter 3, there were two iterations. The government or government bureaus dominated the first iteration to advance the state's agenda of promoting Indonesian palm oil products. The trajectory of the initial iteration leveraged the knowledge from the government and echoed the government's economic development agenda. The second iteration publicly documented the involvement of NGOs, the establishment of civil society networks for public consultation, and a call for public input in several regions through consultations. The trajectory of the second iteration leveraged the knowledge produced with a more diverse actor configuration. The diverse actor configuration in the second iteration was enabled by external shocks, shifting the incumbent ac-

tors' perspectives. Further, the shifting perspective enabled transformative actors with active civil society networks to partner with the government to bring additional insights to the discussion of policy creation.

Shifting perceptions have been observed in the systems transformation and adaptive transformation literature. It is one of the aspects highlighted as fundamental changes leading to a system transformation. The sign of shifting perspective is also related to knowledge production and is influenced by changes in the landscape or crises. The result of Chapter 3 signifies that the KCP activity was possible due to the change in perspective not only of transformative actors but also of the incumbent actors. The shifting perspective was visible through the recurring instances of knowledge co-production activities. Further, the literature mentioned that perceptions change due to crises at the individual and community levels (Benessaiah and Eakin, 2021). While the literature does not necessarily specify what kind of individuals shift their perceptions, the result of Chapter 3 provides evidence of shifting perceptions of incumbents due to crises or landscape changes.

In addition, an example of ongoing external adaptation is shown in Chapter 3(Smith et al., 2005). External adaptation was apparent in how resources and capabilities lay outside the incumbent regime, such as NGOs and their civil society networks. However, due to the ongoing policy application process and the system transformation overall, it is still being determined whether the transformation will lead to endogenous renewal or purposive transition (Smith et al., 2005). The case study in Chapter 3 was partly taken from the "Strengthening Palm Oil Sustainability in Indonesia" project that was a continuation of Revamping ISPO and was funded partially by the Foreign, Commonwealth, and Development Office (FCDO) of the United Kingdom. By the time the research was conducted, the project was undergoing completion.

The latest report provided a rather positive outlook toward the program's future impact, with barriers to the Ministry of Agriculture's capacity to establish a new sustainable certification system. The report also highlighted that the dialogue and pilot projects have "increased the legality of palm oil plantations owned by smallholders, introducing a scheme to solve palm oil in forest areas." In addition, the government of Indonesia has recently funded the ISPO and is developing a plan to institutionalize the ISPO strengthening program further. However, considering the FCDO report that noted the limited functional and staffing capacity of the Ministry of Agriculture had to establish a new ISPO Certification System, the trajectory will depend on whether the government's internal adaptive capacities were able to make deliberate efforts or rely on the external actors' interest to articulate the landscape shocks and to provide resources such as networks and knowledge

to counter the perceived landscape shocks (Smith et al., 2005).

5.2 Strategic interventions through capturing the trigger

The previous sub-chapter has discussed the early part of the transformation. It starts with system instability followed by deliberate actions by some actors to resolve the problems resulting from the instability. The exploration of land governance literature in Chapter 4 analyzed the transformation pathway by first analyzing the triggers of governance change captured by transformative actors actively resolving problems and paying attention to the figurative places, or leverage points these actors direct their strategic agency. However, due to the incomplete nature of the case study and the limited information the study was able to obtain, it is difficult to elaborate on how land governance transforms. Especially, how the actors utilizes their strategic agencies to capture the triggers during the start of transformation process.

There are three phases of co-production that can be valuable for observing early-stage governance transformation dynamics: preparing for co-production, namely representation and actor engagements (Wyborn et al., 2019). In the case of ISPO strengthening, while initiated by the government to address governance gaps in the Indonesian palm oil sector, this dissertation argues that the collaboration between NGOs and their civil society networks emerged as a transformative force. This collaboration facilitated policy innovation and fostered a more multi-stakeholder decision-making process. Additionally, public discussions were held in five different regions across Indonesia. However, this research could not obtain additional perspectives from regional participants or government representatives. Such perspectives could provide more insight into the preparation of regional public discussions, the dynamics of participation and power among regional stakeholders (Turnhout et al., 2020), and a more granular view of actor engagements that can provide a better insight on how knowledge as a leverage points can influence governance transformation.

Managing co-production has the potential to increase the capacity of participants. The ISPO strengthening saw the embedding of an alternative practice, "Jangka Benah", at the national level through its institutionalization in national regulations. Co-production theories provide insight into how this might happen: strategic actors navigating co-production agendas, managing relationships between strategic actors and stakeholders, and maintaining resources (Wyborn et al., 2019). On the other hand, this dissertation also

observed failed efforts in transforming land governance. Growing mistrust (Biitir and Nara, 2016) and coordination problems (Cenamo and Carrero, 2012) prevented governance change. More interview data could allow this study to observe co-production management from a better perspective and provide better insights into how the dynamics of participation and power (Turnhout et al., 2020) within co-production influence the potential for success or failure.

Despite the limitation, this dissertation observed a broader land governance dynamics in the literature. The land governance literature starts from triggers that came from social conflicts, economic development, or the direct and indirect influence of foreign initiatives. Further, observing the transformation in the land governance literature provided additional nuances to the dynamics of perception changes. Perception changes can be categorized into two strategic agencies exercised by the actors: sensemaking and envisioning. By separating these perception changes into two agencies, it is possible to further analyze where knowledge helps enable trajectory changes.

In sensemaking, actors analyze the existing problem and assert their interpretation of a problem with the knowledge they have. For example, farmers conclude that land allocation problems in their area are caused by other farmers claiming land titles or their customary leader allocating land. In the case of palm oil, this is also visible through how the government actors perceived sustainable palm oil as a domestic development issue. The land governance literature and the case of sustainable palm oil see the envisioning process as an internal process that sits in the deepest depth of deep leverage and was not observable through this research. However, the results in Chapter 3 and Chapter 4 observed that the critical point where knowledge can be leveraged to enable trajectory changes is through intervening in the envisioning process. The envisioning agency often involves finding alternative solutions to solve the problems understood through sensemaking. This process involves additional parties or groups of strategic actors. For example, when coming up with a solution to create larger parcels to increase efficiency, the farmers in Galicia cooperated with a local government agent. To prevent land turnover, local NGOs in the Brazilian Amazon work with a public government institution to bundle the REDD+ agreement.

The case of sustainable palm oil provided evidence that the envisioning process is not a black box and is vulnerable to intervention with the right timing, actor network, and resources. Resourceful strategic actors such as KEHATI captured the open moment when the Indonesian government started to shift its perception of sustainable palm oil policy. The mark of the open moment was when the government started to rely on external resources by publishing the letter to establish a policy-strengthening team and ask for

public participation.

However, the literature on land governance change also provided a picture where sensemaking and envisioning result in adjustments without involving external actors, such as the formalization of land tenure by the government or the increasing government surveillance to minimize illegal land conversion in Laos and China. According to the literature on system transformation, these adjustments often happen because the regime has high coordination of response, can withstand external shocks, and can innovate by utilizing its internal resources. These types of adjustment tend to be guided by past experiences and have the risk of ending up being path-dependent.

5.2.1 Gathering momentum for transformation

Envisioning often involves additional parties or groups of strategic actors. The gathering momentum agency overlaps with the envisioning agency with the involvement of additional parties or groups of strategic actors. From the results in Chapter 3 and Chapter 4, it is observable that events such as community meetings or workshops are the strategic actors interact and advance their vision to resolve the existing problem. Incumbent or powerful actors can gather momentum with less powerful strategic actors for an increased adaptation or diffusion.

From the perspective of KCP literature, it is difficult to delineate where the envisioning or the gathering momentum started. Especially considering that it involves multiple stakeholders cooperating and aiming to formulate shared perspectives and understandings. For example, the participants in ISPO strengthening were actors figuring out how to solve the operational problem of ISPO policy. However, through the observation in this research, this dissertation argue that all the iterations of KCP processes are combinations of envisioning and gathering momentum agencies. Gathering momentum requires a shared identity or aims. Some actors may change their aims after a certain external trigger changes their perception or sensemaking process. Further, gathering momentum can have different power dynamics, so it may not be free of conflicts.

5.3 Leverage points for transformation

In the previous section, this chapter imply that knowledge influences actors' envisioning and further the outcome of the transformation trajectory. The results of Chapters 3 and 4 argue that leverages, including knowledge, were utilized to stabilize the regime when there were triggers. Combining

the result of the sustainable palm oil case study and the land governance literature, as also implied in Chapter 4, the leverage points utilized vary depending on the regime's instability after the shock and the availability of internal resources. Several observable leverages are utilized in the land governance literature, some leading to systemic transformation when coupled with strategic agencies such as envisioning or gathering momentum. To discuss the dynamics of leverage and how actors interact, the result from Chapter 3 to will be used to look into how knowledge as leverage points influence governance trajectory.

In the sections above, the problems hindering ISPO were discussed. Specifically, how it serves as an endogenous and exogenous shock and how strategic actors capitalize on the opening made by the shocks through their strategic agency. Then, what was the role of knowledge in influencing governance trajectory? This dissertation could not answer this question due to the incomplete process of the case study and the opaque transformation process in the land governance literature. The point where the involvement of non-governmental stakeholders allowed the inclusion of public feedback obtained from public consultation. This feedback was obtained through representative and aggregation processes instead of directly from the public stakeholders.

Instead of thinking 'whose knowledge is responsible,' it may be better to understand the actors-network and the leverage points that can be utilized through which agents of change. The pressure from researchers and scientists pressured powerful actors to change how they produce and utilize knowledge for sensemaking and envisioning. The utilized knowledge then depends on which actors can access the actors-network central in influencing the policy design element. In the case of ISPO, the non-governmental stakeholders could participate due to their involvement in previous cooperative initiatives with government agencies at the national, regional, and local levels. Unfortunately, this research has yet to observe evidence to support this argument. What was visible through the case of ISPO was evidence that non-government actors can play key roles in making the process more collaborative. Previous literature on leverage points and systemic transformation suggests that while it is important to have agents of change with normative sustainable aims, certain network configurations allow intervention through multiple leverage points. In addition, some literature on leverage points highlighted that driving the transformation may work better through multiple leverage points intervention.

5.4 Linking triggers, actors, agency, and leverage to influence the transformation pathway

The above sections provide insights into how the strategic aspects of triggers, actors, agency, and leverage influence the transformation pathway in land governance, which aligns with what STS and SES hypothesized. Change may begin with one or multiple triggers that result in instabilities and problems that structurally influence actors. These actors then respond with their agency by making sense of the problem and preparing potential innovations as solutions. These potential solutions are then reproduced or transformed, creating a new structure through leverages before they are institutionalized. This cycle is conceptualized as a morphogenetic cycle (Figure 2.2).

Through the SLR in Chapter 3, this dissertation identifies four strategic aspects for deliberate governance change: 'when' (triggers), 'who' (actors), 'where' (leverage points), and 'how' (agency), which is summarized in Table 5.1. In addition, by adding the findings in Table 5.1 to the hypothetical analytical framework in Figure 2.2, a novel analytical framework is presented (Figure 5.1). This framework draws on insights from STS, SES, and literature on land governance change to identify 'when', 'where', and 'how' deliberate change can influence land use governance.

This dissertation provided evidence supporting the hypothetical framework proposed in 2.2. First, this dissertation confirms that triggers cause land governance instabilities. Strategic actors' agencies follow up on these instabilities. Some powerful actors can respond quickly and adjust the governance system. Less powerful actors require networks and resources to capitalize on the governance instabilities for transformation. When less powerful actors can amass resources by gathering momentum, they potentially intervene through leverage points for broader changes. Second, the trajectory described partially confirms the morphogenetic trajectory hypothesis. The land governance trajectory follows the morphogenetic cycle of governance change. However, it could not properly observe any leveraged practices that cause structural change. The hypothesis did not suggest actors' success or failure in executing strategic agencies. This dissertation found that less powerful actors can fail to intervene or access the leverage points. This dissertation observed that mistrust and coordination problems are among the causes of failures. These failures resulted in an incomplete exercise of gathering momentum agency and risk postponing the transformation trajectory. This dissertation will discuss each element of the morphogenetic cycle below.

5.4.1 A morphogenetic cycle of governance change for land governance

In analyzing changes in land governance trajectory, the fields of STS and SES transformation literature have provided many insights. According to both STS and SES, change may begin with one or multiple triggers that result in instabilities and problems that structurally influence actors. These actors then respond with their agency by making sense of the problem and preparing potential innovations as solutions. These potential solutions are then reproduced or transformed, creating a new structure through leverages before they are institutionalized. This cycle is conceptualized as a morphogenetic cycle (Figure 2.2).

By integrating insights from the SES with land governance literature, this dissertation present evidence of land governance change and identify four strategic aspects (Table 5.1) for deliberate governance change: 'when' (triggers), 'who' (actors), 'where' (leverage points), and 'how' (agency). Previous literature on land governance systems has had difficulty inferring causality to understand how transformation occurs (Busck-Lumholt et al., 2022; Munroe et al., 2019). Through operationalizing these four strategic aspects, this research followed the guidance to synthesize lock-in Goldstein et al. (2023). This dissertation provided a novel analytical framework by adapting STS elements to the SES perspective to infer causality in analyzing the transformation dynamics.

Considering the similarities between the STS and SES conceptual framework and the trajectories of land governance transformations, an analytical framework is presented (Figure 5.1). This analytical framework adds to the previous literature by providing a way to understand how transformation occurs in land governance (Busck-Lumholt et al., 2022; Munroe et al., 2019). The analytical framework also adds to the previous literature as a broader and more systematic analysis emphasizing the transformative pathway in land governance as a way out of path dependency Goldstein et al. (2023). Below, this chapter further demonstrates the different strategic aspects that can be used to influence change.

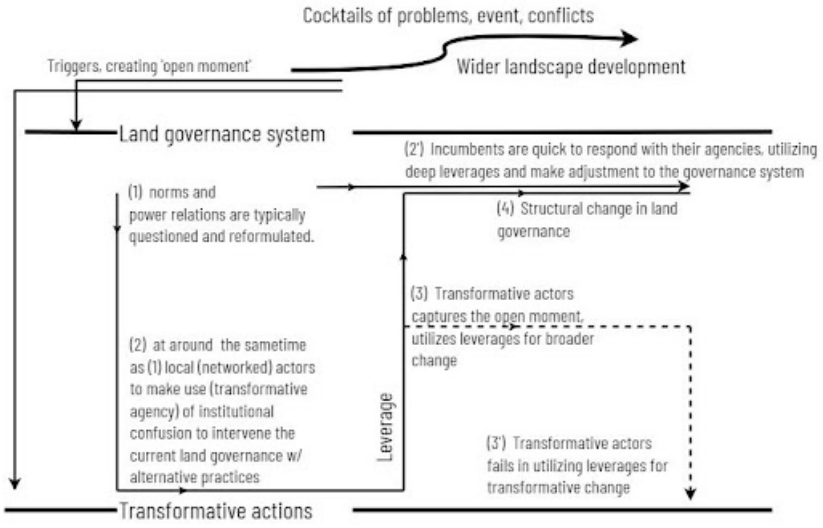

Figure 5.1: Analytical framework on deliberate change in land governance transformation.

Note: Dashed arrows denote a failed trajectory due to some unmet factors. Numbers represent step-wise trajectories following triggers created by landscape changes. Numbers with accents (e.g., 2' or 3') represent alternative pathways depending on the dynamics of actors' agencies.

'When' the triggers should be captured The 'when' aspect of deliberate land governance change is understood as Triggers. 'When' is relevant to the emergence of an open moment where power relations and norms are challenged and reformulated. Previous research suggested that strategically aimed transformative action may be necessary to initiate sustainable transformation Andriamihaja et al. (2021). Through this research, this dissertation agrees with the guidance in synthesizing lock-in Goldstein et al. (2023) and argues that the strategic aspect of timing or temporality is rather important as an enabler for Transformative actors to seize this opportunity to introduce alternative sensemaking and envision alternative practices to gain momentum for their movement. Previous studies suggested that actors' aims toward sustainability may change due to their network and interactions. As demonstrated in Chapter 3, this dissertation argues that triggers are not only a starting point of transformation but also responsible for shifting some actors' aims.

However, land governance literature provided limited insights into when an open moment will arise. Triggers can be difficult to predict, particu-

larly when broader exogenous changes occur gradually over time Geels et al. (2017). To adapt to emerging triggers, transformative actors build alternative practices through transformative agencies and adjust their strategies accordingly Järnberg et al. (2018). When the time comes, they utilize their gathering momentum to leverage the intended transformative actions. Timing is crucial in leading to successful transformation. This dissertation saw that powerful actors are more likely to capture triggers than transformative actors. However, some transformative actors can predict the emergence of an open moment with the help of external actors such as international NGOs. Together, they utilize their transformative agencies to build power and leverage transformative actions.

'When' the triggers should be captured Previous literature on path dependency provided insight into the structural unevenness that may highlight opportunities associated with path-breaking attempts. Through the leverage points perspective, this research introduces a way to unlock lock-in Goldstein et al. (2023). These leverage points are places where sustainable transformation intervention can be initiated Abson et al. (2017); Meadows (1999) 'when' path-breaking opportunities arrive. Through the result of Chapter 4, this dissertation shows that there are various targets that actors can influence.

In the context of land governance, 'where' in Figure 5.1 refers to the straight line connecting the trajectory (2), (3), and (4) as a transformative pathway. Both incumbent actors and transformative actors have the opportunity to target leverage points in land governance. However, the key distinguishing factor is the speed with which they understand and utilize the trigger ('when') and their power (if any). Government actors, as incumbents, are inherently more powerful than potential transformative actors, such as farmers and landowners. As a result, transformative actors must be strategic in anticipating broader changes and gathering momentum before they can utilize the leverage points. Failure to utilize the leverages for transformative change risks wasting the open moment and missing the opportunity for change.

'How' actors access triggers and leverage Agency refers to the conscious actions of actors in response to triggers, whether transformative or incumbent. These actions aim to intervene in leverage points. Previous literature implied that linking resourceful economic actors (network and physical) with less resourceful (transformative) sustainable actors can lead to transformative actions Andriamihaja et al. (2021). This study agrees with the

previous literature and expands the linking concept by demonstrating that transformative actors actively try to link resourceful actors to drive transformation through gathering momentum. Events such as community meetings or workshops are how the strategic actors interact and advance their vision to resolve the existing problem. Here, incumbent or powerful actors can gather momentum together with less powerful strategic actors for an increased adaptation or diffusion.

However, the literature on transformative actions in land governance assumed that actors with different objectives could influence change regardless of power Andriamihaja et al. (2021); Lundsgaard-Hansen et al. (2018). This disseration add to the previous literature by showing that power dynamics affect how actors influence change. The result in Chapter 4, focusing on strategic agencies, provided evidence that agencies influencing land governance trajectory are not independent of power. There are differences between powerful incumbent and less powerful transformative actors in executing their strategic agencies to influence the transformative pathway. Inherently powerful actors, such as incumbents, may be able to skip the process of gathering momentum and steer the change according to their sensemaking and envisioning. However, transformative actors require a stepwise build-up of agency, accessing all agencies before reaching deep leverages and driving transformation. This slow build-up increases the risk of the leverage point being co-opted by more powerful actors to prevent the transformation from happening.

Table 5.1: Factors influencing deliberate change in governance transformation during release and reorganization

Change prerequisites	Description	Key literatures
Triggers External or internal	Potential turning points, providing opportunities to be captured or responded to by other actors	Walker et al. (2004), Moore et al. (2014)
Actors Various levels of government, local community leaders, or international organizations	Individuals or collectives with sustainability aims, access to rich and diverse resources, and a central position in the network	Walker et al. (2004), Andriamihaja et al. (2021)
		Continued on next page

Table 5.1 – continued from previous page

Change prerequisites	Description	Key literatures
Agencies Conscious actions with a certain intended goal include intervening leverage points and responses to triggers from capable actors.	Prepare for change through sensemaking (reinterpreting current problems), envisioning (providing alternative solutions), and gathering momentum (making coalitions). Actors with aligned agency elements tend to coexist and increase their influence on land governance	Westley et al. (2013), Moore et al. (2014), Lundsgaard-Hansen et al. (2018)
Leverages Interventions or leverage points to influence the behavior of a system	The 'place' of interventions varies between shallow to deep, consecutively: parameters, feedback, designs, and intents	Abson et al. (2017), Dorninger et al. (2020)

Source: Author

5.5 Research implication to analyzing the land governance transformation

The revised analytical framework suggests that actors play varying roles at different process phases. For instance, transformative actors can innovate alternative practices regardless of who generates ideas, but some actors' sensemaking may be more crucial than others. Envisioning can help visualize these alternative practices. However, conflicts may arise during the envisioning process, and powerful actors may influence the implementation of these practices. Previous research often frames agencies of transformative actors relative to the state instead of the governance system. This framing made it difficult to analyze the transformative agency within governance change (Scobie et al., 2020). Analyzing transformative agencies such as sensemaking and envisioning *after* triggers can show different roles between NGOs and local actors such as farmers (Moore et al., 2014).

Gathering momentum works well, especially when a shared identity can be formed or gathered, such as aims for land-related activities (Andriamihaja et al., 2021; Moore et al., 2014). However, the process might not be free of conflicts. Hence, gathering momentum agencies are often found in meetings, spreading information, and conflict resolution mechanisms (Lundsgaard-Hansen et al., 2018; Varkkey, 2020; Zhang et al., 2021).

Powerful actors can utilize leverage. Leverages vary from shallow to deep depending on their difficulty and potential impact (Abson et al., 2017). Deep leverages are the "specific structures" (Geels, 2006) in land governance change that are vital for change. Incumbent actors may be better equipped to respond to deep leverages. Transformative actors must gather power to influence deep leverages in response to the triggers. Therefore, the use of leverage by emerging (transformative) actors can fail as time progresses, resulting in a postponed transformation.

Intervention through deep leverage, such as knowledge, interacts with governance transformation trajectory by affecting how actors frame or reframe problems and develop possible solutions. These dynamics critically depend on the origin of knowledge and the existence of transformative actors. Incumbent actors can be better equipped to respond to deep leverages. Incumbent knowledge also has a higher chance of shaping the problem framing and possible solutions, leading to a path-following trajectory. The research about land governance trajectory in China seems unable to draw a path beyond the conflict between transformative arrangement and incumbent structures Zhang et al. (2021). By considering the leverage points integrated into the revised framework, it is possible to analyze where the plausible interventions needed to help promote the transformative arrangement instead of understanding the transformation process as a governance mismatch.

The existence of transformative actors may introduce diverse knowledge origins if networked actors exist, or the transformative actors can gather diverse knowledge during the gathering momentum process, resulting in a more dynamic problem framing and solution. The involvement of NGOs with active networks as transformative actors played a crucial role in making the co-produced knowledge have different goals, contexts, participating actors, and interactions. Further, having transformative actors gathers momentum with incumbent actors, and utilizing the new knowledge for transformation can accelerate transformations. The cooperation can be enabled by having the incumbent actors' perspectives shifted by triggers.

The revised analytical framework (Figure 5.1) can be applied to diverse contexts beyond the Indonesian Sustainable Palm Oil policy case study. For example, when applied to the case of land governance in Galicia (Ónega-López et al., 2010; Tubío-Sánchez et al., 2013), it sheds light on how in-

efficient farming practices, land abandonment, and forest fires triggered an institutional transformation enabled by shifting perceptions and networked scholars. The wider land fragmentation phenomenon makes it difficult to conduct agroforestry farms efficiently, coupled with the high demand for the labor force. The land fragmentation also caused land abandonment and increased the risk of forest fires. The fragmentation drove some farmers to change their perspective towards the usual market and government policies. Some farmers engaged and discussed with the surrounding landowners and a local government technician to leverage their local knowledge about land management and the conditions in the surrounding areas to create a new mechanism to govern the available land.

Under the new practice, the farm is 'aggregated', creating shared ownership and managing it under an intermediary or cooperative where a rental model is possible. Scholars concerned about land abandonment and agricultural structure issues are picking up these social innovations and considering them applicable to the broader Galicia area. Around the same time, the extreme forest fires changed the public's perception and, more importantly, some newly elected government officials. The crises drove government officials to involve various scholars in agricultural structures in the decision-making process. The scholars enabled the new practice of shared ownership and rental model, managed under an intermediary or cooperative, to enter the decision-making process and was solidified into a new law.

In the case above, multiple triggers, such as inefficient farming practices, land abandonment, and forest fires, changed the perspective of farmers, government officials, and members of society about the current institutional structure in how Galicia managed their land. On the ground level, some organic knowledge co-production happens due to the changing perception, enabling some transformative farmers and a local government official to cooperate and innovate new practices. Around the same time, election processes coupled with shifting perceptions of some government officials created an open moment. Scholars familiar with the new practice were invited to the decision-making process to capture the open moment and insert the new institutional innovation to intervene in the design leverage, leading to the institutionalization of the new law.

Chapter 6

Conclusion

6.1 Conclusion

How land-use systems transform from one trajectory to another is well-researched in literature and understood as a result of the exogenous and endogenous feedback mechanisms influencing land-use choice options. Exogenous forces for land use mean that distant drivers influence the land use system. In contrast, endogenous forces mean land use is contested and influenced by societal power relations and asymmetries. Through exploring how to design better governance, land governance research understands that land use influences land-based decisions and practices. However, some argue that more research is needed to analyze the systemic change in land governance.

Against these backdrops, this dissertation explored path-breaking opportunities and knowledge as a leverage point to capitalize on the opportunities of governance transformation through the following overarching research question:

> 'How does knowledge interact and influence land governance transformation?'

In detail, the above overarching question is broken down into three questions. First, to uncover the initial catalysts and factors that initiate this transformation, this dissertation asked the following question: 'How does the land governance system transform?' Second, to uncover the initial catalysts and factors that initiate this transformation, building on the 'windows of opportunity' in land governance transformation and knowledge as a deep leverage point to influence the transformation process, this dissertation asked the following question: 'How do leverage points, specifically knowledge, influence the land governance transformation trajectory?' Third, to elucidate the influential stakeholders and their contributions in shaping the trajectory of

land governance, this dissertation asked the following question: 'How does the origin of knowledge affect the transformation process?'

How does the land governance system transform?

The evidence from land governance literature showed that the land governance system transforms through the dynamic interactions of triggers, actors, and actors' agency as the strategic elements. The above findings partially confirm the hypothetical framework. Most changes in land governance were driven by triggers, such as social conflicts and economic development, that resulted in crises. During these crises, some actors, enabled by the triggers, actively try to exercise strategic agencies such as sensemaking, envisioning, and gathering momentum to solve problems and bridge their solution to a larger scale.

How do leverage points, specifically knowledge, influence the land governance transformation trajectory?

The case study's evidence showed that deep leverage points, especially knowledge, influence the land governance trajectory, which was possible after perception changes within the decision-making actors' configuration. Additional cases from land governance literature provided a similar process where transformative actors sensed problems and conceived some solutions after external shocks hit. These findings confirm the 3rd element of the hypothetical framework. However, this dissertation could not observe any role of knowledge or other deep leverage points in some of the transformed governance in the governance literature. This is due to the empirical limitation met during the observation. It is still being determined whether the conceived solutions could help the governance system transform because of any deep leverage points or knowledge. Multiple sources of evidence, combining documentation, archival records, interviews, direct observations, and physical artifacts, may provide better insights and more granular views on how knowledge as a leverage point can influence governance transformation.

How does the origin of knowledge affect the transformation process?

Unfortunately, neither the observation of land governance literature nor the Indonesian Sustainable Palm Oil (ISPO) case study was able to answer the 'How does the origin of knowledge affect the transformation process?' Through the result of Chapter 3, this dissertation partially confirmed the fourth element of the hypothetical framework. There was instability in the

actors' cognitive structure, which was enabled by the lack of operational capability and international credibility concerns of ISPO, driving the government to invite public stakeholders to strengthen the ISPO. Here, the NGOs, as strategic actors, involved public stakeholders to add additional problem-solving perspectives to shift the problem framing of ISPO. However, the process is ongoing, and it is yet to be seen whether the problem of re-framing can provide context for the national palm oil sustainability context.

6.2 Scholarly contributions and future challenges

This dissertation provides a scholarly contribution as follows. First, this dissertation presents a novel analytical framework for analyzing land governance transformation. This framework complements the previous literature on land system studies by analyzing land governance as a system using a systemic multidisciplinary approach to explore causality and path-breaking trajectories in land governance. Second, this dissertation contributes to Global Environmental Studies by confirming the possibility of analyzing land governance as a system. This dissertation is the first research to analyze land governance transformation by complementing socio-ecological perspectives with the morphogenetic cycle from a socio-technical perspective and leverage points for sustainable transformation. This dissertation argues that to break away from path dependency, timing, knowledge as leverage, transformative actors, and their network are the strategic aspects to consider in driving and enabling transformation.

The empirical limitations of this dissertation made it difficult to observe the utilization of knowledge by transformative actors and analyze how the knowledge influences the transformation trajectory. Future studies can benefit from observing a complete or failed transformation to identify barriers and additional enablers in land governance—for example, the International Aid Transparency Initiative funded part of the strengthening ISPO program through SPOSI. Based on the recent annual review of the ISPO strengthening program, the strengthening of palm oil sustainability is ongoing. There were notable barriers during the implementation, such as the limited capacity of the Ministry of Agriculture. The barrier SPOSI experienced may be related to the need for more shallow leverages or concrete actions related to the stakeholders in the Ministry of Agriculture of Indonesia.

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Appendix A

Appendix

A.1 List of literature consulted for literature review

Below are the actors, agencies, triggers, and leverages observed in the land governance literature. We fit the definitions of each agency type with the strategic actions taken by actors described in the literature. Similarly, we fit the definition of leverage points with interventions observed in the literature.

Table A.1: List of literature consulted for literature review

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Bollens (1993)	Restructuring Land Use Governance	Article	Journal of Planning Literature	Land use governance in the United States. Covering rationales, political motivation for reform attempts, citizen support, and constituencies for change in land use governance.
Moss (2004)	The governance of land use in river basins: prospects for overcoming problems of institutional interplay with the EU Water Framework Directive.	Article	Land Use Policy	EU Water Framework Directive in Germany. Taking an institutionalist perspective, it explores opportunities and requirements for governance in future resource management.
Singh (2009)	Fighting rural poverty, inequality and low productivity through legal empowerment of the poor.	Article	The Journal of Peasant Studies	Commission on Legal Empowerment of the Poor (CLEP). Introducing the broader goal of just land governance built from bottom-up movements.

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Ónega-López et al. (2010)	Planning Innovations in Land Management and Governance in Fragmented Rural Areas: Two Examples from Galicia (Spain).	Article	European Planning Studies	Galicia, Spain. EU. Two innovative examples of land management and governance structures for dealing with land fragmentation in rural areas of Galicia, northwestern Spain. The new governance structures helped to increase the efficiency and sustainability of land use.
Tubío-Sánchez et al. (2013)	Institutional Change in Land Planning: Two Cases from Galicia	Article	European Planning Studies	Galicia, Spain. EU. Examples where land planning is developed to tackle negative outcomes of former institutional setups.

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Cenamo and Carrero (2012)	Reducing Emissions from Deforestation and Forest Degradation (REDD) in Apuí, Southern Amazonas: Challenges and Caveats Related to Land Tenure and Governance in the Brazilian Amazon.	Article	Journal of Sustainable Forestry	Pilot REDD project in Apui, Brazilian Amazon. The study emphasizes the role of local governance through an agreement. The article proposes to engage stakeholders and bind together the interests of governmental, non-governmental, and local civilian institutions through an agreement mechanism of mutual commitments.
Ansoms et al. (2014)	Land Contestation at the Micro Scale: Struggles for Space in the African Marshes.	Article	World Development	African wetland. This paper analyses how local actors instrumentalize the renegotiation of African wetland rights to call into question the prevailing social order. Deficiencies in formal instruments allow certain powerful actors to capture the momentum of an open moment.

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Robiglio et al. (2014)	Beyond REDD+ readiness: land-use governance to reduce deforestation in Peru.	Article	Climate Policy	REDD+ in Peru. This paper assessed two years of REDD+ readiness preparations according to six readiness functions. Peru's national government is to reduce deforestation to zero due to the worsening deforestation rate.
Zhong et al. (2014)	The Impacts on Illegal Farmland Conversion of Adopting Remote Sensing Technology for Land Inspection in China.	Article	Sustainability	Land conversion in China. Technological innovation reduced the illegal conversion of land. In addition, the governance structure change for land inspection has also contributed to deterring illegal farmland conversion. Combining technological and governance structure change helped to deter illegal farmland conversion

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Higgins et al. (2014)	Payments for Ecosystem Services, nonlinearization, and the hybrid governance of land management in Australia.	Article	Journal of Rural Studies	Payments for Ecosystem Services (PES) as governance strategy in State of Queensland, Australia. Institutional blending (existing governance and non-market instruments) and contextual adaptation were crucial in building trust between landholders, farming organizations, and those agencies responsible for governance.
Biitir and Nara (2016)	The role of Customary Land Secretariats in promoting good local land governance in Ghana.	Article	Land Use Policy	Local land governance in Ghana. Changes in social structure increase the number of individual landowners. This influences the cooperation and collaboration between formal and customary land governance. Multiple land governance may co-exist with conflicts.

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Boutthavong et al. (2016)	Historical Changes of Land Tenure and Land Use Rights in a Local Community: A Case Study in Lao PDR.	Article	Land	Historical land governance changes in Lao PDR. Government-led policies, investments, and activities have been key drivers in land governance change in Lao PDR. State-led formalization process triggered inequality among local households.
Lundsgaard-Hansen et al. (2018)	Whose Agency Counts in Land Use Decision-Making in Myanmar? A Comparative Analysis of Three Cases in Tanintharyi Region	Article	Sustainability	Tanintharyi Region, Myanmar. This study analyses who influence land use decision-making, how they do this, and under what circumstances smallholders are included. There are unequal agencies and mutually exclusive interests between powerful actors and smallholders in the top-down interventions regarding land governance. Collaborations are likely to happen when there are mediator supports or if the interests are aligned, despite inequal agency.

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Table A.1 – continued from previous page

Authors (Pub. Year)	Title	Document Type	Journal	Case Study Areas/ Scope
Varkkey (2020)	Palm oil, state autonomy, and assemblage of land use governance in Sarawak, Malaysia.	Article	International Review Of Modern Sociology	Land use governance in Serawak, Malaysia. State government helping conversions in native customary lands, and peatlands to palm oil plantation through influencing the land governance design.
Zhang et al. (2021)	The suitability and sustainability of governance structures in land consolidation under institutional change: A comparative case study.	Article	Journal of Rural Studies	Rural land rights in China. Land governance structure need to fit with the problem situation. Institutional change can lead to governance structural change, depends on the incentives of actors.
Musinguzi et al. (2021)	Assessment of the land inventory approach for securing tenure of lawful and bona fide occupants on private Mailo land in Uganda.	Article	Land Use Policy	The Mailo tenure in Uganda. Improving the institutional design can reduce the conflict between formal and customary land governance. In this case, improving the flow of information through information transparency.

A.2 Lists of news articles used from Lexis Nexis news database

Table A.2: Lists of news articles used from Lexis Nexis news database

Publisher	Publication Date	Title
Antara	October 28, 2010	ISPO diprioritaskan bagi perkebunan sawit besar
Antara	November 9, 2010	Indonesia siapkan ISPO untuk panduan perkebunan sawit
Koran Tempo	November 14, 2010	Menteri Pertanian perjuangan agar standar sawit Indonesia diakui dunia
Koran Tempo	November 14, 2010	Persyaratan RSPO dinilai tak adil bagi Indonesia
Antara	December 10, 2010	Indonesia akan berlakukan ISPO dalam perdagangan CPO
Antara	January 21, 2011	ISPO siap diberlakukan pada tahun ini
Koran Tempo	January 24, 2011	PTPN III siap ISPO tahun ini
Antara	February 4, 2011	Pengusaha harapkan penerapan ISPO sebelum 2014
Antara	February 4, 2011	GAPKI minta biaya ISPO di bawah RSPO
Antara	February 9, 2011	Pemerintah fasilitasi penerapan ISPO
Antara	March 29, 2011	Standar minyak sawit lestari Indonesia dicanangkan Rabu
Antara	March 20, 2014	Lahan sawit tersertifikasi ISPO 378 ribu ha
Antara	December 10, 2014	Kementan dorong industri sawit lakukan sertifikasi
Antara	November 22, 2015	Menuju standar lebih tinggi sawit berkelanjutan
Antara	April 9, 2017	GAPKI: Sertifikasi ISPO bersifat wajib
Tempo	July 16, 2020	Pemerintah percepat sertifikasi ISPO lahan kelapa sawit

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Table A.2 – continued from previous page

Publisher	Publication Date	Title
Koran Tempo	September 22, 2021	Capaian minim sertifikasi lahan sawit

A.3 Lists of interviewees

Table A.3: Lists of interviewees

Observation	Interviewee	Institution/Organization	Date
Observation #1	Rostanto Suprapto	Indonesian Biodiversity Conservation Trust Fund	February 23, 2022
Observation #2	Irfan Bakhtiar	Indonesian Biodiversity Conservation Trust Fund	February 23, 2022