



Climate-smart cocoa in forest landscapes: Lessons from institutional innovations in Ghana

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ABSTRACT

Integrated landscape approaches have been welcomed by scientists and development practitioners as a promising way to address commodity-driven deforestation and associated land degradation and greenhouse gas emissions. They present cross-sectoral approaches to manage trade-offs between multiple land uses and environmental and socio-economic objectives through participatory multi-stakeholder planning and negotiation processes. The success of landscape approaches depends on the larger institutional systems of rules, regulations, and actor networks in which they are embedded. Yet, there remains a critical gap in our understanding of how such enabling conditions can be established. Taking the case of Ghana, this research analyses cross-sectoral institutional innovation in commodity and forestry regimes promoting the enabling conditions to move integrated landscape approaches from theory to practice. As part of its National REDD+ Strategy, Ghana has led the way for jurisdictional REDD+ and has successfully mobilized broad-based stakeholder engagement and funding around a shared purpose: climate-smart cocoa in community co-managed forest landscapes. In this article, we apply a Multi-Level Perspective (Geels, 2002) to analyse the process of institutional innovation under the Ghana Cocoa Forest REDD+ Programme (GCFRP). Despite early signs of regime change and alignment in Ghana's cocoa and forestry sectors, GCFRP's success is threatened by, amongst others, frustrated reforms to tree tenure and timber benefit-sharing rights. Our research demonstrates that political commitment for institutional change beyond landscape and jurisdictional scales is essential to enable climate-smart landscape transitions.

1. Introduction

Global commodity production is a major contributor to deforestation and land degradation and related greenhouse gas (GHG) emissions in tropical countries (Curtis et al., 2018; Henders et al., 2015; Ordway et al., 2017). Therefore, many governments and companies have recently begun eliminating deforestation from 'high forest risk' supply chains (Carodenuto, 2019; Taylor and Streck, 2018; Wardell et al., 2021), while transitioning toward more 'climate-smart' production systems (CFI, 2018; Lipper and Zilberman, 2018).

In the past, most public and private efforts to delink commodity crop production from deforestation have not managed to transform practices and outcomes at scale, however. Because the many public policies and institutions regulating commodity sectors and natural resources are often misaligned, inter-sectoral externalities and socio-environmental trade-offs are in practice rarely anticipated and managed (Taylor and

Streck, 2018). While non-state market-driven governance innovations such as codes of conduct and third-party certification systems have sought to address these issues, most struggle to transcend niche markets and contribute to systemic change (Cashore and Stone, 2012; DeFries et al., 2017; Ingram et al., 2018; Mithöfer et al., 2016). Several public-private interventions have shown promise, but since they are often project-based and limited in their geographic scale, they have proven neither transformative nor sustainable beyond typical donor funding cycles (Carodenuto, 2019; Nelson and Phillips, 2018).

Integrated landscape approaches have been promoted as a promising 'new' alternative. Through integrated land use management and planning, such approaches seek to reconcile competing land uses and interests at the level of the landscape. Such a landscape is typically spatially delimited by a particular socio-ecological system (Sayer et al., 2013) or political administrative boundary (Nepstad et al., 2013). In the latter case, they are referred to as jurisdictional approaches. Both

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approaches necessarily involve multi-sectoral and multi-level perspectives that aim to anticipate and respond to socio-ecological trade-offs and sources of land use competition, often using bottom-up, participatory, and multi-stakeholder methods (Arts et al., 2017; Pedroza-Arceo et al., 2022). The integrated landscape approach concept dates back to the 1980s, when integrated spatial planning principles were used to simultaneously address nature conservation and socio-economic challenges (Arts et al., 2017). In the past decade, jurisdictional approaches have gained popularity as jurisdictions are in many situations considered the right scale and unit to build alignment between sustainable value chain objectives and national climate and conservation agendas (Pacheco et al., 2017).

Despite gaining significant political traction and scholarly interest (Adeyanju et al., 2021; Boyd et al., 2018; Milder et al., 2014), there is no common framework for implementing integrated landscape and jurisdictional approaches. Because experience with such approaches is limited, the evidence base needed to inform such frameworks is still lacking. However, with many innovative initiatives being piloted across diverse contexts, researchers and policymakers are beginning to take stock of how these approaches can best be designed to deliver impact at scale (Buchanan et al., 2019; Fishman et al., 2017; Irawan et al., 2019). This paper contributes to these efforts.

Much of the emergent literature has focussed on design principles for integrated landscape approaches as attributes of the decision-making process itself at the landscape or jurisdictional level. These studies stress the importance of, amongst others, inclusive multi-stakeholder processes, common concern entry points, transparent monitoring and evaluation, continuous learning, and adaptive management (Axelsson et al., 2012; Freeman et al., 2015; Sayer et al., 2013). Even though such principles help contribute toward positive outcomes, some of the issues integrated landscape approaches aim to address transcend landscape and jurisdictional boundaries. Some scholars have, for example, shown that effectiveness is often impeded by structural institutional barriers such as unfavourable land and tree tenure policies (Boyd et al., 2018; Kusters, 2015) and lack of economic incentive (Sayer et al., 2015; Seymour et al., 2020). Because such issues cannot be resolved at the landscape level alone, polycentric governance structures that not only permit horizontal but also vertical coordination are increasingly considered integral to the efficacy and durability of landscape approaches (Mwangi and Wardell, 2012; Nagendra and Ostrom, 2012; Ros-Tonen et al., 2018). For landscape approaches to succeed at scale, integrated landscape initiatives need to be nested within national and sub-national structures that support and are responsive to landscape-level challenges. To date, little is however known about how such institutional arrangements can be forged.

One such initiative is being piloted in Ghana. Ghana has embraced integrated landscape approaches as part of its country-wide strategy for the UNFCCC Reducing Emissions from Deforestation and Forest Degradation (REDD+) programme. Pioneering a commodity-centric approach, Ghana's 2016–2035 REDD+ Strategy presents a nested governance model with large sub-national programmes defined around ecological and commodity production landscapes embedded in a national programme and implemented in so-called Hotspot Intervention Areas (HIAs) defined around jurisdictional (district) boundaries. This research examines the case of the Ghana Cocoa Forest REDD+ Programme (GCFRP), the first sub-national programme, launched in 2017, that aims to curb deforestation associated with cocoa production. Through an elaborate multistakeholder process, Ghana began designing incentive mechanisms and supporting institutional arrangements for community-based land use planning and natural resource management and climate-smart cocoa (CSC) production.

Ghana is one of the first countries to champion a jurisdictional commodity-based REDD+ programme and has successfully leveraged broad-based stakeholder engagement and funding. An in-depth analysis of Ghana's institutional innovation process will provide valuable insights into how integrated landscape approaches can be moved from

theory to practice. This research examines how incentive mechanisms and institutional arrangements co-designed under GCFRP have managed to enable integrated landscape approaches, and to what effect. We unpack Ghana's institutional change processes using institutional innovation theory; specifically, applying the Multi-level Perspective (MLP) proposed by Geels (2002, 2004). Geels theorizes how socio-technical regimes, understood as the "semi-coherent set of rules carried by different social groups" (2002, p. 1260), change over time through external (e.g., global market pressure economic, climatic, and political shifts) and internal forces (e.g., coalitions and innovations). In this article, we will explore how the GCFRP development process facilitated institutional change and managed to alter Ghana's forestry and cocoa regimes.

This article is structured as follows. Section 2 will examine the state of knowledge on integrated landscape approaches and institutional innovation, while situating GCFRP within Ghana's forest and cocoa regimes. In Section 3 we describe the study area, Juabeso-Bia, and the research methodology. The subsequent section starts with an analysis of GCFRP innovation processes, before examining how these propelled forest and cocoa regime changes. The final sections reflect on the implications of findings on the creation of more enabling conditions for integrated landscape approaches in general and jurisdictional REDD+ in particular.

2. Conceptual framework: institutional innovation for GCFRP

2.1. Integrated landscape and jurisdictional approaches

The 'Integrated landscape approach' is an umbrella term for spatially-explicit approaches that integrate multiple domains and policy objectives. It emerged to address complicated and intractable issues, such as climate change and biodiversity loss, requiring multi-scale and intersectoral solutions and coordinated action across myriad stakeholders (Arts et al., 2017). The approach builds on integrated conservation and development initiatives and community-based natural resource management projects that emerged in the 1970s and 80s in response to hard conservation strategies prevalent in protected area management. It thus attempts to exploit synergies and resolve tensions between environmental (conservation, restoration) and socio-economic (sustainable livelihoods, food security) objectives (Arts et al., 2017; Reed et al., 2017; Sayer et al., 2013).

Jurisdictional approaches are a specific type of integrated landscape approaches, differentiated by their focus and geographic coverage. Whereas landscape approaches are more conservation oriented, jurisdictional approaches tend to be more market-oriented; typically stemming from sustainable value chain and zero-deforestation agendas (Fishman et al., 2017; Pacheco et al., 2017). Geographically, jurisdictional approaches follow administrative and political boundaries rather than socio-ecological boundaries such as a forests or watersheds (Boyd et al., 2018; Nepstad et al., 2013). Jurisdictional approaches place particular emphasis on the role and leadership of sub-national government (Boyd et al., 2018) and have become the preferred approach amongst zero-deforestation and REDD+ champions requiring close government participation. International consumer goods manufacturers also widely embrace jurisdictional approaches since these better align with preferential sourcing policies emanating from the New York Declaration on Forests. Since jurisdictional approaches typically externalise monitoring and traceability costs to sub-national government, manufacturers can deliver on their zero deforestation commitments without needing to establish expensive traceability systems (Arts et al., 2017; Pacheco et al., 2017). These approaches are prevalent in Latin-American and South-East Asian countries producing high-forest risk commodities such as soy, beef, and oil palm (Buchanan et al., 2019; Fishman et al., 2017; Stickler et al., 2018).

While there is no single way to design and implement integrated landscape approaches and jurisdictional approaches because they

should be tailored to local contexts, scholars and practitioners have identified some key design principles (see for instance (Fishman et al., 2017; Kusters, 2015; Reed et al., 2017; Sayer et al., 2013)). They are in essence bottom-up multi-stakeholder integrated planning processes offering a negotiation and learning space to develop shared objectives, coordination mechanisms, and participatory governance systems. By adopting an integrated perspective, such approaches help bring to light trade-offs and synergies between environmental, social, and economic objectives. Multi-stakeholder participation and coordination, often achieved through multi-stakeholder platforms, enables cross-learning, experimentation, and intervention co-design. This is intended to enhance local ownership of new innovations, and ensures these innovations correspond with local development objectives and remain adaptive to changing circumstances. The efficacy of such multi-stakeholder approaches is contingent on transparent monitoring and reporting using actionable metrics consistent with landscape development objectives (e.g., deforestation rate, emission reduction, food security, resilience, household income).

Moreover, several institutional factors beyond the landscape or jurisdictional level have been brought forward in the literature as pre-conditions for the success of these approaches. Ostrom (2010) and Ros-Tonen et al. (2018) have identified the need for institutional bridging across scales, stakeholders, and sectors to allow for multi-level or polycentric governance.¹ Rodriguez-Ward et al. (2018) and Reed et al. (2017) stress the importance of active government engagement to develop these institutional arrangements, address any institutional bottlenecks, and institutionalize landscape arrangements through policy and regulation. In a review of seven integrated landscape initiatives, Sayer et al. (2015) conclude that unsuccessful initiatives tend to be those that struggle to motivate participation and investment by companies and subnational leaders by failing to develop value propositions consistent with their interests. While REDD+ and other performance-based payment systems do encourage broader-based participation, revenues from carbon credits rarely exceed profits associated with deforestation (Bastos Lima et al., 2017; Gizachew et al., 2017). Other incentive mechanisms, such as preferential sourcing, green investment, fiscal transfers, reputational benefits, and landscape certification are being trialled more but are still in nascent stages of development (Boyd et al., 2018; Seymour et al., 2020). Hence, an institutional change process is needed to develop the enabling institutional structures for integrated landscape and jurisdictional approaches. The question arises: how can such institutional change take shape?

2.2. The multi-level perspective on institutional innovation

We draw on institutional innovation theory and socio-technology studies (Geels, 2002, 2004; Geels and Schot, 2007; Latour, 1990; Turnheim et al., 2015) to analyse the institutional change processes emerging from Ghana's REDD+ strategy. One well-established theory to analyse institutional innovation is the multi-level perspective on system innovation (MLP) developed by Geels (2002, 2004, 2007). MLP distinguishes between three levels of systems innovation: socio-technical regimes, innovation niches and the socio-technical landscapes. Socio-technical regimes encompass the institutions, social networks, and materiality (artefacts and infrastructure) that together influence social behaviour (Geels, 2004; Raven, 2007). Such institutions include the formal and informal rules shaping social (human-human) and human-environment interactions and are enacted and reproduced by local practices (Geels, 2002, 2004; Ostrom, 2005). These manifest, for instance, through government policies and regulations, market

¹ Polycentricity refers to situations with many centres of decision-making that are not necessarily hierarchically ordered (as in the case of multi-level governance) but that do involve overlapping jurisdictions (Ostrom, 2010; Ros-Tonen et al., 2018).

arrangements and incentive mechanisms, culture, and technological infrastructure. Socio-technical regimes can be observed in many societal spheres, such as in national energy sectors or global food systems (Geels and Schot, 2007). Through the interdependence of the dominant institutions, actors and materialities, socio-technical regimes are 'dynamically stable': "Regimes will be reproduced via prevailing regulatory, normative and behavioural practices, but also through active defence and resistance strategies of dominant market players." (Turnheim et al., 2015, p. 241). Regime changes do happen, but often in incremental rather than disruptive ways. Because of path-dependencies, inertia, and vested interests, actors and social networks tend to actively defend existing regimes.

Innovation niches are initiatives where regime restrictions are temporarily lifted to allow for learning and experimentation. This makes them "test-beds for alternative technologies, institutions and social networks" (Raven, 2007 p. 2199). Innovation niches can emerge when a group of actors decides that a regime is no longer in line with their needs, or they can be actively created through innovation policy.

Finally, the socio-technical landscape is the dynamic exogenous context outside the direct influence-sphere of regimes or niche actors. It encompasses slow-changing trends and developments such as macro-economic fluctuations and climatic change and rapid events such as price shocks. These put pressure on and can destabilise existing socio-technical regimes and create 'windows of opportunity' for regime change. Institutional innovation occurs when coalitions can make use of these 'windows of opportunity' to push niche innovations. This may in time lead to a new equilibrium in the socio-technical regime (Geels, 2002, 2004).

The socio-technical regimes of interest for this study are Ghana's cocoa and forestry sectors. Together, they form the enabling environment in which the GCFRP is taking shape. We analyse how these regimes have changed as a result of socio-technical landscape and niche pressures and to what extent this institutional change has provided the enabling conditions for successful implementation of GCFRP.

2.3. Ghana's forestry and cocoa regimes

As a relic of its colonial history, Ghana's forestry regime can be identified as a pluralistic legal system combining customary and statutory rules and responsibilities. While most land is governed by traditional authorities under customary law, the right to natural resources, including trees and forests, are vested in the President (Forestry Commission [FC], 2016). The Forestry Commission (FC), an executive agency under the Ministry of Lands and Natural Resources, is responsible for management of all forest resources. Its Wildlife Division is responsible for the management and protection of Wildlife Reserves and National Parks gazetted for conservation purposes. Its Forest Service Division is responsible for the management and exploitation of Forest Reserves gazetted for silvicultural practices, as well as the management and exploitation of naturally-occurring off-reserve timber. Most of the off-reserve lands can be used for agriculture, but any naturally occurring trees belong to the state. The Forest Service Division can allocate a timber utilization contract to a timber company to fell trees but should share revenues with District Assemblies and Traditional Authorities. District and Municipal Assemblies are the third-tier administrative bodies after regions and headed by the District/Municipal Chief Executive. They are partly elected and partly appointed by the President. The Climate Change Unit of FC coordinates the design and implementation of the national REDD+ programme and is responsible for implementing GCFRP with the Ghana Cocoa Board (COCOBOD).² COCOBOD is a semi-autonomous public agency, currently hosted by the Ministry of Finance.

² In 2018, the Climate Change Unit was upgraded to a Climate Change Directorate to strengthen further institutionalisation (including mandate and resources) of REDD+ coordination and implementation.

Ghana is the second largest cocoa producing country in the world after Ivory Coast, accounting for an estimated 19% of global supply (Carodenuto, 2019). The cocoa market in Ghana is semi-private (Deans et al., 2018), governed by both state and market (Vellema et al., 2016). COCOBOD used to monopolize Ghana's cocoa value chain, but after structural adjustment reforms, had to cede market control to licensed buying companies (Williams, 2009). Ghana had 48 registered licensed buying companies in 2018 (IDH, 2018). Most of these are of Ghanaian origin but large international cocoa traders such as Olam, Cargill and Mondelez are also represented. These companies can buy cocoa from farmers but must sell to COCOBOD. The Cocoa Marketing Company, a COCOBOD subsidiary, then sells the beans on the international market. COCOBOD is responsible for quality control and sets minimum farmgate prices to ensure fair compensation of farmers. With fixed farmgate and sales prices, companies compete mainly on volume and try to differentiate themselves to farmers through their service offering (Williams, 2009) and relationship building (Ton et al., 2008).

Cocoa is an important source of tax revenue to Ghana and provides a livelihood for an estimated 60% (800,000) of rural households (COCOBOD, 2020). Much of Ghana's cocoa is produced within small-holder systems of 2 ha or less, with yields averaging 400–450 kg/ha - far below cocoa's 1000–1500 kg/ha yield potential (Wessel and Quist-Wessel, 2015). This is partially attributable to old stand age, prevalence of pest and disease and use of low-input production practices (Gockowski et al., 2011; NCRC, 2018; Wessel and Quist-Wessel, 2015). Traditionally, low productivity is offset by extensification, but this often involves conversing of 'vacant' forestland (Hill, 1963). Cocoa has long been cultivated in shaded agroforestry systems in Ghana, but in the Western Region where our study area is located this has given way to unshaded cocoa in response to the availability of sun-tolerant varieties and influence from perceived higher-yielding farms in adjacent Cote d'Ivoire (Gockowski et al., 2011; Ruf, 2011; Gallagher, 2015).

2.4. Ghana Cocoa Forest REDD+ Programme (GCFRP)

An extensive body of literature on the early years of Ghana's REDD+ process and its efforts to become 'REDD Ready' has emerged (e.g., Asare, 2015; Asiyambi et al., 2017; Den Besten et al., 2019; Gallagher, 2015; Ochieng et al., 2013; Satyal, 2018). These reveal how extensive planning and consultation helped Ghana graduate from a national REDD+ programme focussed on carbon credits to a jurisdictional programme centred around major commodity crops and various drivers of deforestation. To reduce GHG emissions, Ghana's 2016–2035 REDD+ Strategy envisions a nested programme consisting of five sub-national programmes within distinct agroecological commodity landscapes. GCFRP is the first sub-national programme that was launched, covering the high forest zone in the country's South-West where deforestation and land degradation are primarily driven by cocoa. Given its delineation around an agroecological zone, GCFRP can be classified as an integrated landscape approach, though implementation is more jurisdiction-focussed through its HIAs. Each of the first six HIAs covers two to four administrative districts and is managed by a consortium of government (FC and COCOBOD), private sector (cocoa buying and processing companies) and civil society actors (FC, 2017a).³ Fig. 1 shows the HIAs selected as priority areas for GCFRP.

GCFRP aims to produce approximately 295.4 million tons of emission reductions in twenty years (2017–2037) of which 10 million tons in the first five years (2017–2021) (FC, 2017a). In 2014, the programme was accepted in the pipeline of the Forest Carbon Partnership Facility for an Emission Reductions Payment Agreement (ERPA) for up to \$50 million for the first 10 million tons of emission reduction, which was signed in 2019 (World Bank, 2019). As the first subnational

REDD+ programme implemented in Ghana, the GCFRP is responsible for developing and piloting new institutional structures to support a transition to climate-smart cocoa and forestry. These include a governance model, incentive mechanisms and supporting institutional structures for community-based land use planning, carbon accounting, and CSC.

2.5. Research objective

This article contributes to the literature on integrated landscape approaches in general and jurisdictional approaches in particular by analysing how institutional structures beyond the jurisdiction can create the necessary enabling conditions. Using MLP, we analyse the institutional innovation and cross-sectoral alignment in the process leading up to and the first years of implementation of GCFRP (2007–2019) and map the changes in Ghana's forestry and cocoa regimes. We aim to understand how forces at the niche and landscape level have been leveraged to mobilize regime change, which institutional innovations have been developed and how inertia and certain path-dependencies have been addressed. Lastly, by identifying primary outstanding challenges, we aim to inform land use policy in Ghana and beyond.

3. Research design

This article offers an in-depth case study of institutional innovations in the first years of GCFRP (Gerring, 2004; Kumar, 2019; Yin, 2014). To delineate the scope of its case study, we follow Gerring's (2004) definition: "an in-depth analysis of a relatively bounded phenomenon where the scholar's aim is to elucidate features of a larger class of similar phenomena" (p. 341). The case study is 'bounded' by the three governance levels summarized in Table 1, reflecting the nested governance model of Ghana's REDD+ programme. The Juabeso-Bia HIA was selected because it is instrumental in the design of GCFRP. In this section, we introduce the Juabeso-Bia HIA and implementation consortium and present the research methods used to analyse the parallel design and implementation processes at the national, sub-national (GCFRP) and HIA level.

3.1. Juabeso-Bia Hotspot Intervention Area

The Juabeso-Bia HIA has been identified as a priority intervention area for GCFRP and Ghana's national REDD+ Programme. Implementation started in 2017 under the Partnership for Productivity, Protection & Resilience in Cocoa Landscapes (3PRCL): a consortium consisting of FC, COCOBOD, the NGOs the Nature Conservation Research Centre (NCRC), SNV Netherlands Development Organisation and Agro Eco, and the French commodity trading company Touton. 3PRCL under the leadership of Touton is responsible for designing the HIA governance structure and piloting institutional arrangements and incentive mechanisms for a climate-smart transition (NCRC, 2018).

Juabeso-Bia sits in one of Ghana's main cocoa production areas. It is in the North-East of Ghana's high forest zone on the Ivorian border dominated by moist semi-deciduous forests. The jurisdictional area consists of two administrative districts, Juabeso and Bia-West, which together cover 265,717 ha and a national park and two forest reserves. In 2021, the combined population was 204,695 (Ghana Statistical Service, 2021). Between 2000 and 2015, the deforestation rate was 2.62%, amounting to a total forest loss of 91,000 ha (NCRC, 2018). This translates to an annual forest loss of 6088 ha and average annual emissions of 777,930 tCO₂ (ibid.). Cocoa is the most dominant crop across the landscape resulting in a cocoa mosaic typical in this part of Ghana. Productivity has declined due to old average stand age, climate change, and infection with Cocoa Swollen Shoot Virus Disease (CSSVD) (Gockowski et al., 2011; Ruf, 2011; Läderach et al., 2013). Juabeso and Bia fall under the jurisdiction of the Sefwi Wiawso Paramount Chief and Traditional Council, with multiple divisional chiefs and sub-chiefs. The

³ An area of around 200,000 ha was considered a manageable size for each HIA. The six HIAs do together cover 2.5 million ha (FC, 2017a).

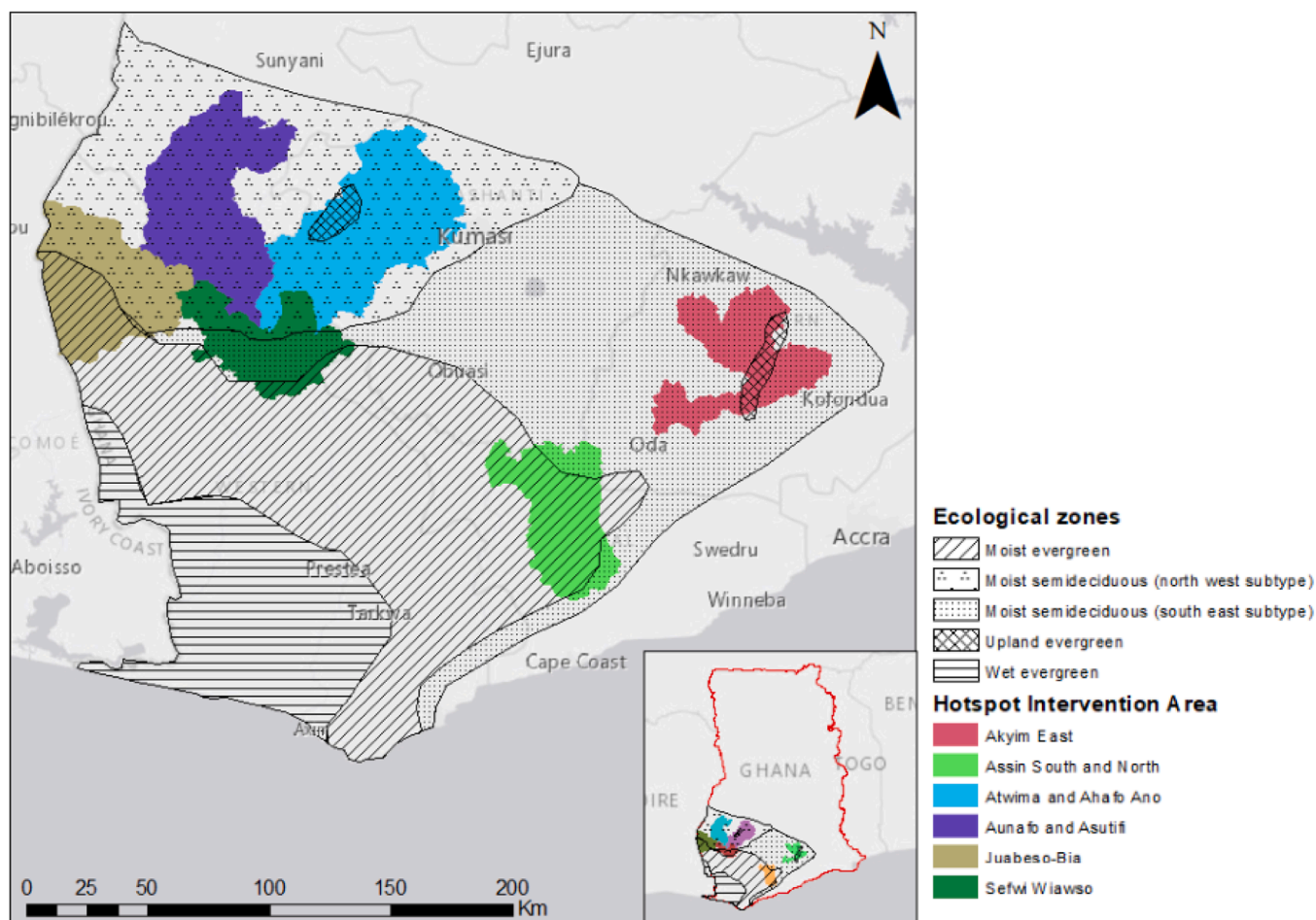


Fig. 1. Hotspot Intervention Areas (HIAs) prioritised for GCFRP implementation.(Note: FC, 2018a).

Table 1
Focus of research at each governance level.

Governance level	Focus of research
National	Ghana National REDD+ Strategy
Sub-National	Ghana Cocoa Forest REDD+ Programme (GCFRP)
Hotspot Intervention Area	Juabeso-Bia HIA

dominant land holding type is stool land, generally leased out to tenants for a period of 50 years, followed by family land (NCRC, 2018). Fig. 2 depicts the land cover in 2018.

3.2. Research methods

Our case study research covers innovation processes between 2007 and 2019. This initially involved a literature review and analysis of secondary data, policy documents, and materials. Appendix 1 provides an overview of the policy documents consulted, which, amongst others, include Ghana’s REDD+ Strategy, GCFRP and its institutional arrangements (governance structure, reference level and monitoring, tree tenure and benefit sharing).

Drawing on desk study results, 40 key informant interviews were held with key stakeholder groups using a snowball sampling approach.⁴ These include 3PRCL partners, traditional authorities, local government,

⁴ Given the scope of the research and the early stage of implementation, we did not map all stakeholders impacted by GCFRP, but instead focused on agents of change.

community resource management executives, private sector representatives, donors, and NGOs active in Juabeso-Bia. Appendix 2 provides an overview of the stakeholders consulted.

The objective of the key informant interviews was threefold. First, to validate desk study results on past innovation processes. Second, to gain insight into GCFRP at the national and HIA levels in relation to its theories of change, institutional design features (institutional arrangements and incentive mechanisms), implementation progress and unresolved challenges. Thirdly, to map changes in institutional arrangements over time, driving factors for these changes, and innovation niches that accordingly emerged.

Interviews were semi-structured and involved questions about the respondents’ role and responsibilities in the GCFRP process, their reason for joining, and the extent to which GCFRP serves their interest and has affected their operations. Researchers also joined a 3PRCL consortium meeting in 2019 to gain greater insight into the HIA’s implementation status and challenges.

To identify institutional change process in accordance with MLP, we, firstly, used the interview results to reconstruct dynamics within Ghana’s cocoa and forestry regimes before the start of the National REDD+ Programme and associated institutional barriers to jurisdictional REDD+. We then analysed how changes in the socio-technical landscape opened-up ‘windows of opportunity’ to integrate niche innovations around cocoa agroforestry and community-based resource management into the REDD+ strategy design and GCFRP. Finally, we assessed how the institutional arrangements and incentive mechanisms developed enable the application of jurisdictional approaches and support a CSC landscape transition.

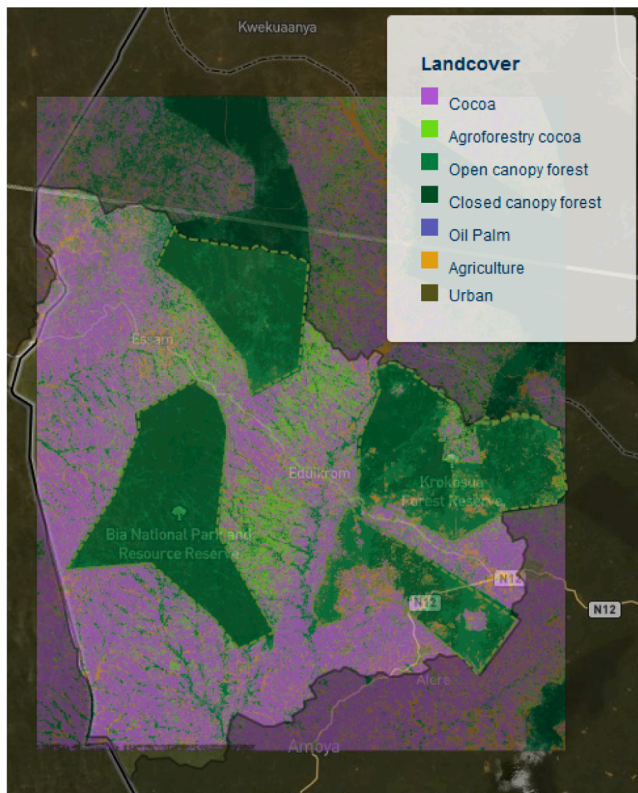


Fig. 2. Juabeso-Bia HIA land cover 2018. (Note: Developed by Satelligence (3PRCL, 2020).).

4. Results

In this section, we trace the influence of socio-technical landscape pressures and innovation niches in the GCFRP innovation process (4.1). We then assess the governance model, incentive mechanisms and institutional arrangements and how these were operationalized in the Juabeso-Bia HIA (4.2). Finally, we assess to what extent these innovations produce regimes changes in the forestry and cocoa sectors and enable future implementation of GCFRP (4.3).

4.1. Landscape pressures and niche initiatives that shaped GCFRP (2007–2019)

Fig. 3 summarizes the socio-technical landscape pressures and innovation niches that influenced GCFRP innovation processes. Emergent global REDD+ discourse and funding created socio-technical landscape pressures that mobilised actors seeking to capitalize on carbon finance opportunities. Following the launch of the World Bank's Forest Carbon Partnership Facility (FCPF) in 2007, the National REDD+ Secretariat was established at the FC Climate Change Unit to design and coordinate Ghana's REDD+ programme. Fig. 4 summarizes key REDD+ developments in Ghana between 2007 and 2019. The REDD+ Secretariat led the development and submission of a REDD+ Readiness Project Idea Note in 2008 and the Readiness Preparation Proposal in 2010 (FC, 2010). Both were ultimately approved by the FCPF. In the REDD Readiness phase following approval, Ghana began developing the fundamentals for performance-based carbon financing through a \$ 3.4 million FCPF REDD Readiness grant (Asare, 2015). This involved, amongst others, analysing deforestation drivers, establishing carbon reference levels, stock-taking of relevant existing projects, and identifying institutional barriers that could frustrate implementation.

During the REDD Readiness process, new coalitions of public, private, and civic actors emerged that all sought to exploit a window of

opportunity for expanding the scope of REDD+ to include, in addition to forest, local livelihoods and agronomic practice. In 2009, the National REDD+ Technical Working Group (NRTWG) was established to co-design Ghana's REDD+ Strategy. This included representation from various Ministries,⁵ the National House of Chiefs, civil society organisation and the private sector. The NRTWG and its seven sub-Working Groups provided a platform for collaborative learning, problem solving and planning (Den Besten et al., 2019; FC, 2016, 2017a).⁶ In 2011, a Climate-Smart Cocoa Working Group (CSCWG) was established by NCRC and Forest Trends with funding from the Rockefeller Foundation. The CSCWG included members from cocoa buying and processing companies, government (COCOBOD and FC), financial institutions, farmers associations, civil society, and research institutions. Some were also actively involved in NRTWG (COCOBOD, 2020; NCRC and FT, 2013). Inspired by growing interest in climate-smart agriculture and experience from Latin America, the CSCWG explored viability of a REDD+ programme involving CSC agroforestry (NCRC, FT, 2013). Viability was eventually confirmed by remote sensing and carbon accounting. In particular, improved access to higher resolution satellite imagery in this time helped better distinguish between planted trees (including cocoa agroforestry) and (secondary) forests and more accurately capture land use cover change dynamics within complex mosaic landscapes (Carodenuto, 2019; FC, 2017b).

The CSC agenda was further supported by scientific evidence that began establishing clearer links between global commodity production and climate change. In 2011, the Climate Change Agriculture and Food Security research programme published maps that showed a drastic decline in land suitable for cocoa production in future, estimating that the cost of climate change inaction to Ghana's economy could amount to \$410 million per year by 2050 (Bunn et al., 2018; Läderach et al., 2011; Läderach et al., 2013). The research showed that the periphery of the cocoa belt is likely to become particularly unsuitable for cocoa production and alternative livelihood opportunities should be sought. In other areas, however, the micro-climate for cocoa production could be improved by transitioning to more drought-tolerant species and increasing the number of shade trees on farms and within the landscape. A large share of our respondents (government agencies, NGO's, companies) identified these maps as the wake-up call for the cocoa sector by showing that the emergent crisis demanded large-scale collaborative action across the cocoa and forestry regime, while offering a common concern entry point to encourage collaboration between FC and COCOBOD. As a result, the maps helped align interests of historically competing forestry and cocoa regimes, creating a window of opportunity for the developing a jurisdictional REDD+ programme on CSC under joint FC-COCOBOD leadership. That was ultimately the impetus for GCFRP.

Early REDD Readiness analyses also showed that a large share of annual deforestation took place outside of Ghana's forest reserves (FC, 2010). In 2016, FC estimated annual off-reserve deforestation rates to be two percent (FC 2016, p. 29). Supported by a plethora of consultancies and policy analyses (e.g., Asare, 2013; Dumenu et al., 2014; Ministry of Lands and Natural Resources [MLNR], 2016), the NRTWG and CSCWG identified tree tenure and benefit sharing as the main institutional barriers to successful off-reserve tree management. As the rights to naturally occurring trees are vested in the President, farmers and local communities do not share in the benefits but do often incur costs when timber companies fell trees on their farm and damage surrounding cocoa

⁵ These include the Ministry of Local Government, Ministry of Land and Natural Resources, Ministry of Finance, Ministry of Environment, Science and Technology, and Ministry of Agriculture (FC, 2017a).

⁶ The NRTWG sub-Working Groups were: Measurement, Reporting and Verification (MRV); Consultation and Participation; Policy, Legislation and Governance; Safeguards; Monitoring and Evaluation; REDD+ Demonstration; and Gender (FC, 2017a).

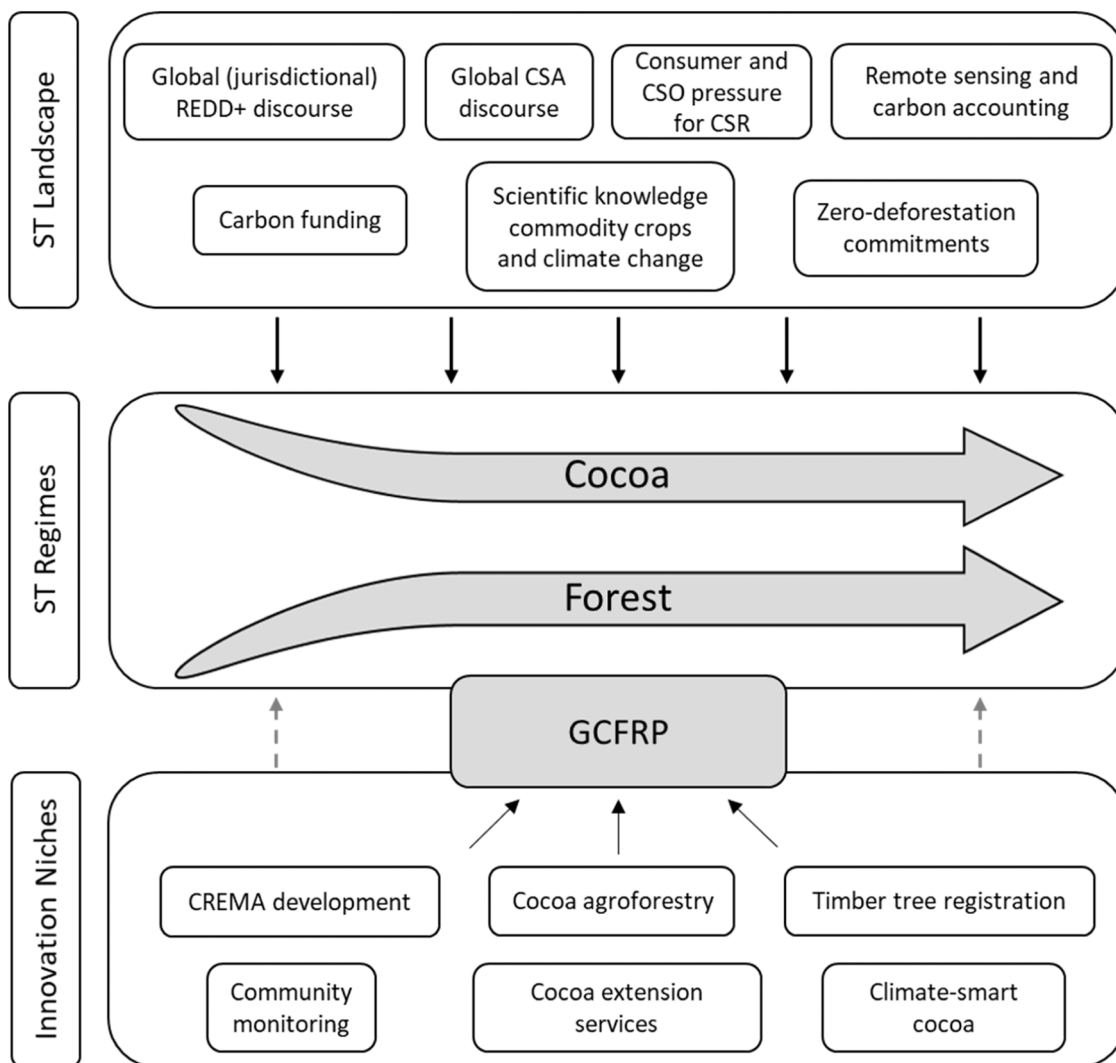


Fig. 3. Innovation niches and socio-technical (ST) landscape pressures that have shaped GCFRP.

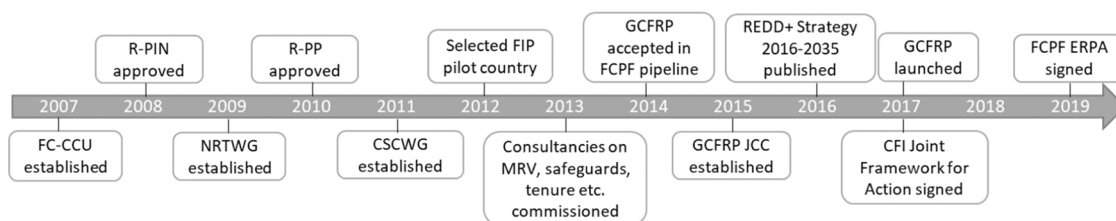


Fig. 4. Key REDD+ developments in Ghana (2007–2019). (Note: Expanding on [Asiyambi et al., 2017](#), added data from [Den Besten et al., 2019](#); FC, 2016; FC, 2017a and interviews; FC-CCU = Forestry Commission Climate Change Unit; R-PIN = Readiness Project Idea; NRTWG = National REDD+ Technical Working Group; R-PP = Readiness Preparation Proposal; CSCWG = Climate-Smart Cocoa Working Group; FIP = Forest Investment Programme; MRV = Measurement Reporting and Verification; GCFRP = Ghana Cocoa Forest REDD+ Programme; FCPF = Forest Carbon Partnership Facility; JCC = Joint Coordination Committee; CFI = Cocoa and Forest Initiative; ERPA = Emissions Reduction Payment Agreement).

trees in the process.⁷ This system has long discouraged farmers and communities from planting timber trees and actively managing naturally occurring shade trees (FC, 2016; [O’Sullivan et al., 2018](#)).

The Working Groups accordingly developed innovation niches to test

⁷ Officially, timber companies would have to compensate communities for social responsibility agreements and compensate farmers for any crop loss in the timber felling process, but these obligations are rarely fulfilled ([O’Sullivan et al., 2021](#)).

models for community engagement, benefit-sharing, and CSC production. For the former, they sought to build on pre-existing governance models of Community-Resource Management Areas (CREMA). The CREMA model was developed in the early 2000s by FC Wildlife Division for community wildlife management and habitat protection in areas bordering protected areas and forest reserves. By developing landscape management plans, including clearly defined landscape boundaries and bylaws for resource management, monitoring and enforcement, communities can obtain Certificates of Devolution from FC. These grant

formal rights to manage and use off-reserve natural resources for wildlife management, non-timber forest products and eco-tourism (Baruah et al., 2016; Murray et al., 2018; NCRC, 2019). The CREMA model was embraced by NRTWG and CSCWG as a governance mechanism for community-level monitoring, reporting, sanctioning, and benefit sharing and extending REDD+ goals from forest protection and restoration to sustainable rural development (Asare, 2013; Den Besten et al., 2019).

To aide community benefit-sharing, a timber registration procedure was developed by a consortium of FC, World Cocoa Foundation, Agro Eco, Sustainable Food Lab and Meridia. In 2018, they registered the first shade trees on 150 farms in the Western Region (Dohmen et al., 2018). CSC was furthermore operationalised and tested by COCOBOD and partners. In collaboration with World Cocoa Foundation, Rainforest Alliance and the CGIAR's Climate Change, Agriculture and Food Security Program, they developed manuals for cocoa extension and CSC production (CHED, 2016). Rainforest Alliance and Olam were able to develop and market the first CSC bean (Brasser, 2013; Nojonen et al., 2014). Some of these niche innovations were integrated into GCFRP.

GCFRP began implementation in 2017 in the six HIAs. These HIAs are innovation niches in themselves, deliberately created to design and pilot context appropriate institutional arrangements and incentive mechanisms. The HIAs were selected by the National REDD+ Secretariat based on the intensity of cocoa-driven deforestation, presence of private sector and NGO projects, and existing implementation structures. The Secretariat reached out to numerous companies and NGOs to form implementation consortia and explore funding opportunities. Large international cocoa traders such as Touton, Olam, Hershey and Mondelez began assuming leadership over the HIA consortia. These companies also signed onto the Cocoa and Forest Initiative (CFI)⁸ in 2017 at the COP 23 in Bonn. Under CFI, major cocoa buying and processing companies and cocoa producing countries (Ghana, Côte d'Ivoire, and Colombia) committed to "end deforestation and land degradation in the cocoa supply chain" by discontinuing any sourcing from protected areas, investing in climate-smart production practices, and using landscape approaches to help design more integrated landscape management plans (CFI, 2018). Engagement in GCFRP enables companies to meet their CFI commitments, thereby helping the Ghanaian government unlock private investment in support of GCFRP. The REDD+ Secretariat expects 51% of GCFRP implementation costs to be covered by private investments (FC, 2017a). Another important source of funding is the Forest Investment Programme (FIP), which committed US\$50 million.

The Juabeso-Bia HIA came off the ground in 2017 following the formation of 3PRCL. Touton was asked to lead the consortium by FC because of its ongoing community forest caretakers programme in the landscape. NCRC was included as consortium partner for their extensive experience with CREMA establishment and their involvement as knowledge partner in the REDD+ process and CSCWG. SNV was furthermore included for their experience with cocoa rehabilitation and CREMA formations and Agro Eco for their prior work on CSC extension and certification.⁹

P4F provided 50% of the funding for the first three years of implementation. The other 50% was contributed by consortium members,

⁸ The CFI was facilitated by the Sustainable Trade Initiative (IDH), the World Cocoa Foundation (WCF) and the Prince of Wales's International Sustainability Unit (ISU) and financed by Partnership for Forests (P4F) and the Dutch Ministry of Foreign Affairs. In 2020, 35 cocoa and chocolate companies had signed up to the initiative, translating to around 80% of global cocoa usage (WCF, 2020).

⁹ Other actors that were active in the landscape shared that they did not join 3PRCL because they felt that too many organisations would slow down the process. Rainforest Alliance and Olam, for example, continued their support to their Landscape Membership Board in Juabeso, but lead the Sefwi Wiawso HIA implementation consortium instead. Solidaridad and Tropenbos Ghana focussed their efforts on community engagement and strengthening of CREMAS.

largely leveraging existing projects in the landscape. Given their joint expertise with CREMA establishment and CSC institutions, 3PRCL was tasked with developing a blueprint for the HIA governance structure and pilot testing incentive mechanisms and institutional arrangements for a transition to climate-smart production and landscapes, as outlined in the next section.

4.2. Niche innovations within GCFRP (2017–2019)

In this section we present the institutional innovations developed under GCFRP, including the blueprint for its governance model (4.2.1) and the incentive mechanisms and supporting institutional arrangements (4.2.2). Moreover, the first experience implementing these in Juabeso-Bia are analysed.

4.2.1. The HIA governance model

Fig. 5 shows how the HIA governance structure (Panel B) is nested in the national REDD+ structure (Panel A) through multi-level polycentric governance. Multiple CREMAS form a sub-HIA, which is governed by a sub-HIA Executive Committee consisting of CREMA representatives. Multiple sub-HIAs form an HIA, governed by the HIA Management Board consisting of representatives from sub-HIA Executive Committees. The Management Board reports to the GCFRP Programme Management Unit. In places without CREMAS, Community Resource Management Committees are formed instead and similarly integrated into sub-HIA structures (NCRC, 2019).

Much like the CREMAS, both the sub-HIAs and the HIA Management Board are tasked with developing land use management plans and the constitution and bylaws that define land use rules and sanctions for illegal activities (FC, 2017a). As laid out in the HIA governance framework, these plans should be developed through a bottom-up, consultative process that reflects local priorities, values, and customs. The bylaws are gazetted and incorporated into the District Development Agenda by the District Assembly. The CREMA Executive Committees educate communities on land use plans and bylaws, and also monitor and sanction illegal activities. Community forest guards, for example, patrol off-reserve areas and forest boundaries and report any illegal activities. Additionally, the role of the HIA Management Board and the sub-HIA executive committee is to coordinate interventions on deforestation and CSC in the sub-HIA. They serve as entry-points for new initiatives and assess proposals on their alignment with landscape management plans and ongoing initiatives in the landscape (NCRC, 2020; interviews).

The HIA governance bodies are supported by a consortium of government agencies, private sector actors and CSOs/NGOs. In consultation with the HIA Management Board, they develop projects consistent with HIA objectives and management plans. In contrast to the 3PRCL consortium, which is a short-term collaboration for the formation of the HIA infrastructure, the HIA Consortium is intended as a permanent institution. Over time, new actors can take over consortium membership from actors exiting the landscape. This allows for continuity of support in the face of short-term project funding cycles. The HIA Consortium and Management Board sign a Framework Agreement and form an HIA Implementation Committee. The HIA Implementation Committee oversees the implementation and financing of the HIA Management Plan and manages the HIA financial account for carbon finance and any other funding streams (see Section 4.2.2).

As land custodians and community representatives, traditional authorities largely fulfil an advisory role as HIA patrons. They also educate communities on activities of the (sub)HIA committees, invoke traditional authority to encourage natural resource management practices stipulated in the HIA Management Plan and bylaws, sanction illegal activities, and arbitrate disputes (NCRC, 2020). As incentive, traditional

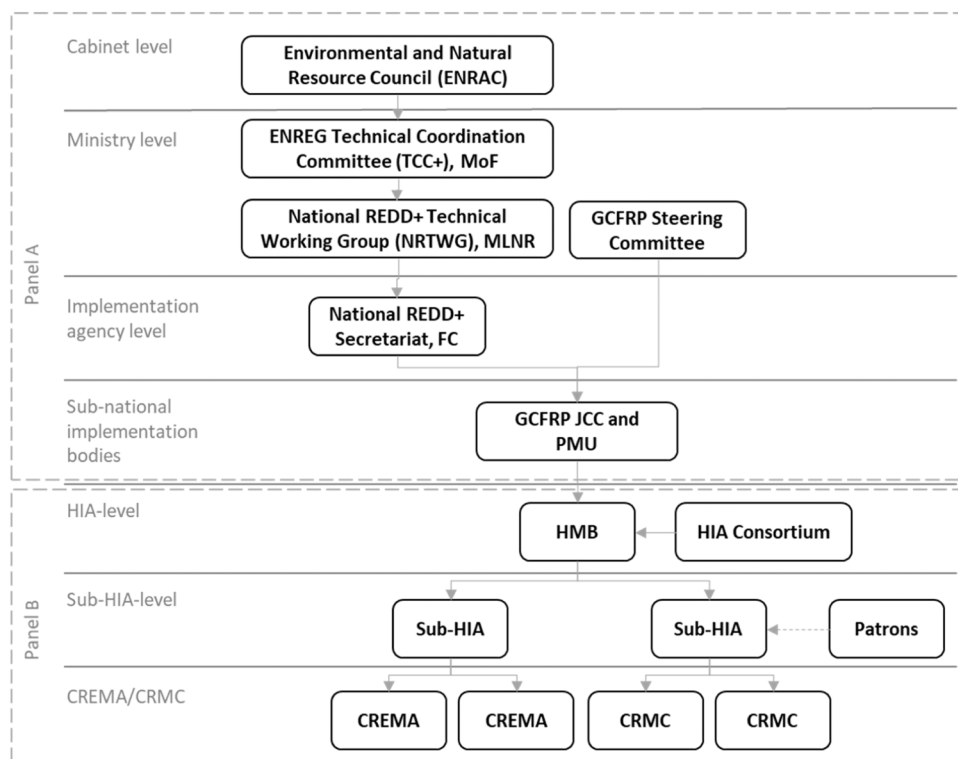


Fig. 5. REDD+ and GCFRP institutional structure. ENREG = Expanded Natural Resources and Environmental Governance; MoF = Ministry of Finance; GCFRP= Ghana Cocoa Forest REDD+ Programme; MLNR = Ministry of Lands and Natural Resources; FC = Forestry Commission; JCC = Joint Coordination Committee; PMU = Programme Management Unit; HIA = Hotspot Intervention Area; HMB = HIA Management Board; CREMA = Community Resource Management Area; CRMC = Community Resource Management Committee). (Note: Adapted from FC, 2016, 2017a; NCRC, 2019).

authorities receive 3% of the carbon funding distributed to the HIA for performing these activities (FC, 2018a).¹⁰

Interviews with 3PRCL members and (sub) HIA executives suggest that 3PRCL in Juabeso-Bia prioritised establishing the HIA governance model and pilot-testing incentive mechanisms first. At the time of research, the HIA Management Board and sub-HIA executive committees had just been established and were in the process of drawing-up bylaws. In October 2019, Juabeso-Bia became the first HIA to sign a Framework Agreement with FC and COCOBOD. Through the agreement, the Management Board formally commits to implementing ‘CREMA-type landscape planning and management processes’, drafting and implementing bylaws for forest protection, CSC farming, and on-farm tree management, and supporting CSC adoption. FC in turn commits to monitoring safeguards, grievances, and benefit-sharing, reporting on landscape level sustainability outcomes, strengthening forest law enforcement, and implementing tree tenure reform. COCOBOD commits to supplying CSC inputs and extension packages, mapping cocoa farms for traceability purposes, and improving public-private collaborations (FC, 2021, Appendix 4). Addenda to the Framework Agreement have been signed by the 3PRCL partners, Tropenbos Ghana, Solidaridad, Proforest and Mondelez¹¹ and together they form the HIA implementation consortium tasked with delivering on commitment under the Framework Agreement. In addition, interviewed paramount chief and divisional chiefs welcomed the initiative for helping stop forest encroachment and depletion and providing livelihood opportunities for their constituents. A committee of chiefs established the Forest Reserve Encroachment Remediation Committee to map illegal farms in the forest

¹⁰ The rest will be divided between the HIA (69%), government departments involved in the implementation of GCFRP (27%) such as FC, COCOBOD and the Municipal/District Assemblies and the GCFRP Programme Management Unit (4%) (FC, 2018a).

¹¹ Other cocoa and chocolate companies were initially deterred from joining the initiative by the branding of the HIA as the ‘Touton Landscape’, though this was corrected at a later stage and Mondelez joined the implementation consortium.

reserves and to facilitate a remediation process (NCRC, 2020).

4.2.2. Incentive mechanisms and supporting institutional arrangements

GCFRP developed several farm and community-level incentive mechanisms to motivate and assist transitioning to climate-smart production systems and landscapes. Fig. 6 summarizes these, as well as expected funding sources and supporting institutional arrangements.

Cocoa farmers are offered ‘CSC engagement packages’ that help increase productivity and enable uptake of climate-smart technologies. These include access to inputs (e.g., improved planting material for cocoa and shade trees, fertilizers and pest and disease management products), cocoa extension services (technical and marketing), training on management and regeneration of shade trees, and financial products (credit services and crop insurance).¹² Integration of shade trees on cocoa farms serves multiple objectives, including carbon sequestration, improving micro-climates, adapting to shocks, and enhancing soil fertility, while also generating alternative sources of income from fruits and fodder (NCRC, 2018). To receive CSC engagement packages, farmers must adhere to the HIA Management Plan and COCOBOD’s CSC Production Standard. When their cocoa is eventually marketed as climate-smart, farmers are expected to receive a CSC premium. These farm-level incentives are initially focussed on cocoa production but may be extended other crops in future.

At the community-level, alternative livelihood projects and community projects are planned. The former are intended to generate employment and promote livelihood diversification, as alternatives to activities involving forest encroachment. The latter include infrastructural developments such as roads and health services. Based on the HIA Management Plan, the HIA Implementation Committee will designate a consortium member to implement such projects (FC, 2017a).

¹² Members of 3PRCL and other HIA implementation consortia explained that the packages should be adjusted to local needs and adoption barriers in different HIAs in consultation with the HIA Management board and Executive Committees.

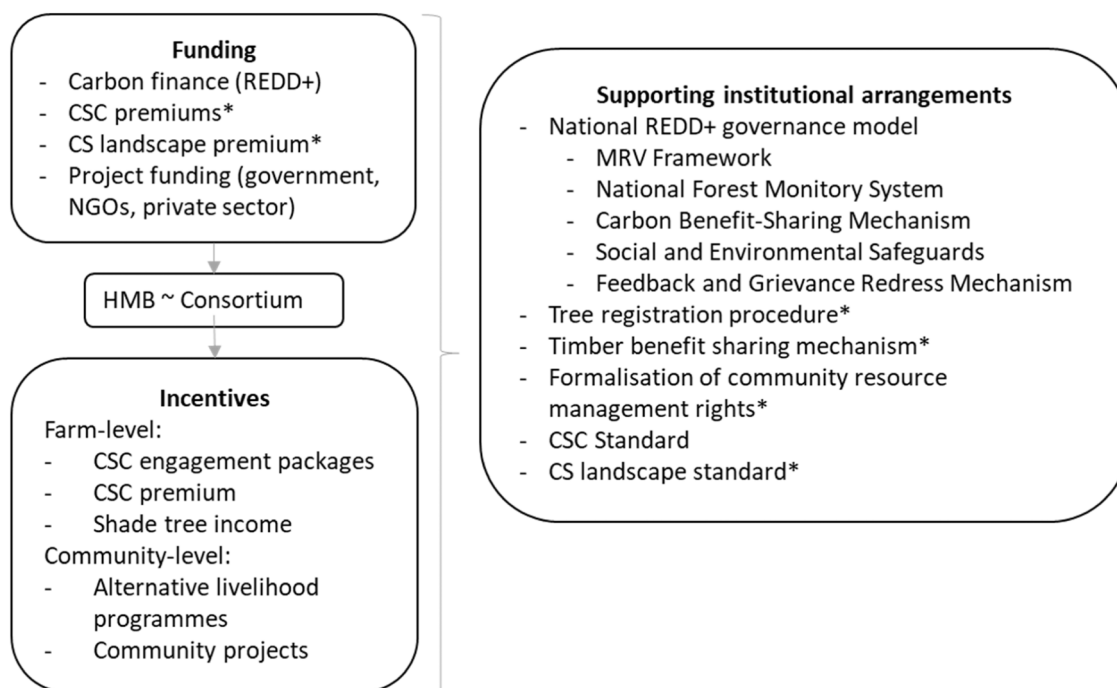


Fig. 6. Incentive mechanisms, funding streams and supporting institutional arrangements. (Note: Items with * still under development.).

At the time of research, 3PRCL members were piloting the design of these incentive mechanisms. Building on existing Touton and SNV projects with cocoa farmers and forest fringe communities, CSC engagement packages were piloted, and community forest guards trained. Moreover, they initiated a feasibility study for crop insurance that can help mitigate farmer risk against climatic shocks. Alternative livelihood projects were still in their conception phase, but harvesting of non-timber forest products (e.g., medicinal plants, nuts, spices) on communal or private lands and cottage industries such as soap-making were being considered. Two NGOs however expressed concern over identifying economically viable livelihood alternatives, partially because Juabeso-Bia is far from the main markets of Kumasi and Accra and road conditions are poor.

The governance model foresees several different funding streams besides REDD+ (Fig. 6). These include CSC premiums, climate-smart landscape premiums and project funding from government, NGOs, and private sector partners. Project funding may also include in-kind benefits directly distributed to farmers and communities as part of the CSC engagement packages or community projects. The HIA Management Board and Consortium play a central role in attracting and allocating HIA funding.

Lastly, the success of the programme depends on effective institutional arrangements outside the HIA. These include national REDD+ arrangements and the associated Measurement Reporting and Verification Framework¹³ (FC, 2017b), the National Forest Monitory System (FC, 2017b, 2021), Carbon Benefit Sharing Mechanisms (FC, 2018a), Social and Environmental Safeguards, and Feedback and Grievance Redress Mechanisms (FC, 2017a, 2018a, 2018c, 2018d, 2018e, 2021). In addition, supporting institutional arrangements for formalizing community resource management rights and benefit sharing and monitoring and valorising climate-smart cocoa and landscapes are

critical to success. Yet, as we will see in the following section, these still pose substantial challenges.

4.3. Regime change in Ghana's cocoa and forestry systems

REDD Readiness activities exposed structural deficiencies in Ghana's forestry and cocoa regimes. In this section, we analyse the extent to which the GCFRP innovation processes described above helped change these. We will discuss how path-dependencies and inertia constrain regime change and assess regime alignment dynamics. Fig. 7 summarizes key regime changes and alignment issues.

4.3.1. Forestry regime

Since the start of its REDD+ process, Ghana's off-reserve forestry regime in the HIAs has shifted from a system of exclusive state ownership and management to a system of co-management and community benefit sharing. The REDD+ process reiterated reform needs, by bringing together stakeholders, facilitating communal problem analysis, and providing incentives for change. Backed by findings from REDD Readiness and FIP policy analyses and consultancies, this process demonstrated the relevance of off-reserve lands for forest protection and the need for tree tenure reform. While procedures and administration systems for Measurement Reporting and Verification, grievances and carbon benefit sharing were successfully developed, formalisation of community management rights and tree tenure and benefit-sharing reforms have been limited in scope and pace.

Since the CREMA model established in 1994 predates REDD+, supporting policies and structures are already in place. In 2016, there were 32 CREMAs in Ghana, with 24 having obtained management rights by the Ministry of Lands and Natural Resources (Murray et al., 2018). Full legal devolution of management rights including carbon benefits to CREMAs is, however, still lacking. The Wildlife Resource Management Bill that is supposed to provide this has been before Parliament multiple times since 2014 and was approved by the Cabinet in November 2021 but, at the time of writing, is yet to be passed. Delays are caused by a long review process of penalties and sanctions for wildlife offenses (Ghana News Update, 2021).

For GCFRP, tree tenure reform and benefit sharing mechanisms

¹³ Based on a reference period of 2001–2015, the reference level is set at an average expected emission of 60.7 million tonnes of carbon per year in a business-as-usual scenario (FC, 2017b). Ghana's forest definition is in line with the IPCC threshold: "a minimum canopy cover of 15%, height of 5 m and area of 1 hectare" (FC, 2017a p. 96).

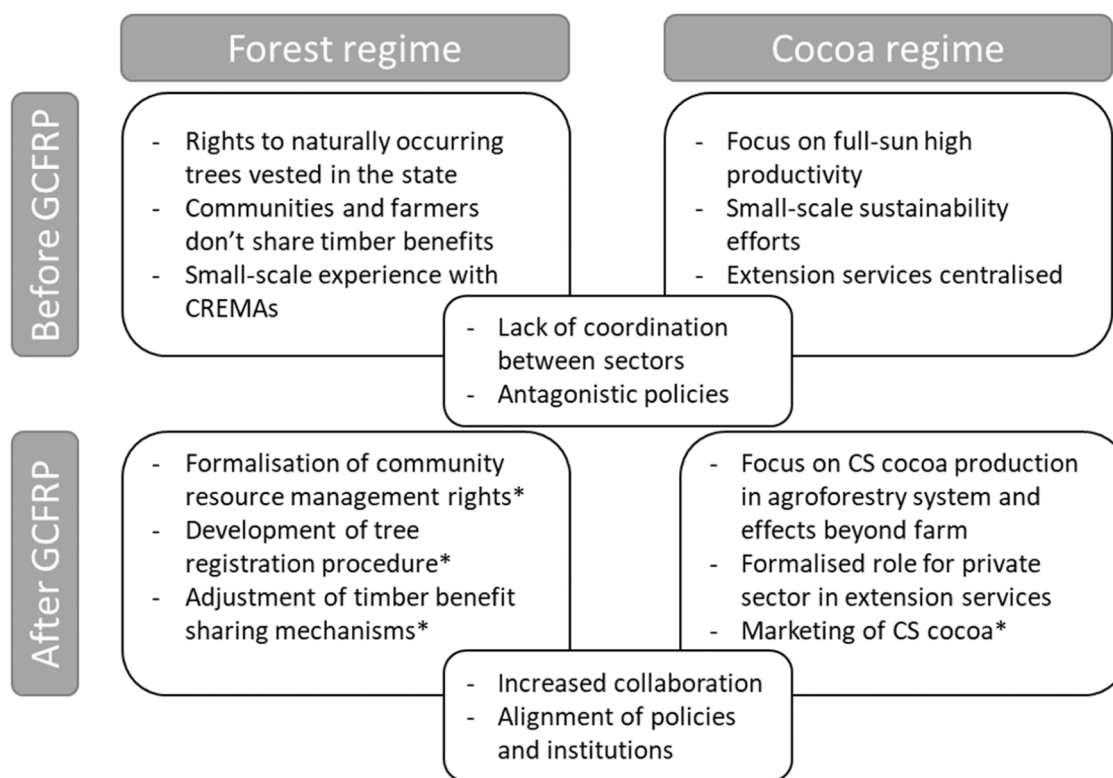


Fig. 7. Change and alignment in Ghana's cocoa and forestry regime. (Note: Items with * still under development.).

present the main institutional bottleneck. Multiple interviewed NRTWG members hoped that the 2012 Forest and Wildlife Policy would fundamentally change tenure rights in favour of communities. The economic rights to naturally occurring timber trees, however, remain vested in the government since a reform would require extensive constitutional amendments (see also O'Sullivan et al., 2021). Instead, the FC pursued tree registration. Building on earlier pilots, they developed a tree registration form and procedures for registering individual trees.

At the time of research, the FC was still pilot-testing tree registration procedures in Juabeso-Bia and other HIAs and developing a national tree registry. 3PRCL members and companies and NGOs assisting farmers with registration deemed the procedure laborious and costly. Each individual timber tree needs to be measured and registered by a FC officer. Registration costs (logistics and data management) are estimated at over 20 GHS (approximately US\$3) per tree, excluding labour costs of FC officers (NCRC, 2020). Regional FC offices currently lack human resources to register trees at scale. Moreover, respondents contend that farmers will be challenged to register trees individually without support from farmer organisations, NGOs, or companies.

Discussion about timber benefit-sharing were not concluded at the time of research. Under GCFRP and FIP, multiple proposals were developed for reforming benefit-sharing mechanisms for planted and naturally-occurring timber trees. These mostly involve stumpage fees allocated to farmers and communities as 'tending fee' (MLNR, 2019; MLNR, 2016). A FIP proposal, for example, suggested that 60% of the management fee collected by the FC should be allocated to farmers (MLNR, 2019). The FC is, however, reluctant to cede their share, instead suggesting that timber companies should pay an extra fee of 15% (NCRC, 2020).

The tree tenure and timber benefit-sharing reform process demonstrates how vested interests limit the scope for institutional innovation in the forestry regime. Institutions rooted in Ghana's colonial history and post-independence period therefore often resist radical reforms, with traditional beneficiaries of timber revenues (FC and the timber industry) reluctant to relinquish their stakes. While the FC Climate

Change Unit is championing REDD+, other FC departments are more hesitant. Further formalisation of the HIA model and timber registration, as well as adequate compensation for tree management, is needed to effectively align the off-reserve forestry regime with climate-smart objectives and outscale these outside HIAs.

At the same time, increased formalisation and monitoring threaten informal income streams of local communities from timber and non-timber forest products (Hirons et al., 2018; Maguire-Rajpaul et al., 2021). Traditional authorities and community resource management executives emphasized that communities in Juabeso-Bia have traditionally been dependent on timber and forests for their livelihood. Very few alternatives exist, especially for landless youth and migrants that are alienated from cocoa markets and are more inclined to engage in illegal activities such as poaching and mining. Failing to provide viable alternative livelihood options will therefore inhibit forest regime change.

4.3.2. Cocoa regime

A Cocoa regime change is also apparent. Before REDD+, cocoa policies paid little attention to sustainability issues. COCOBOD focussed on increasing cocoa output by distributing hybrid varieties and managing disease. As a result, average cocoa yields increased by 5.6% per year between 2002 and 2010, but also continued to expand onto forestland (Gockowski et al., 2011). Sustainability efforts were mainly driven by NGOs, certification agencies and Corporate Social Responsibility projects. Following consumers and civil society sustainability and fair-trade pressures, from the mid-2000s, a large number of especially private sustainability initiatives emerged globally, ranging from voluntary sustainability standards to individual corporate initiatives and public-private partnerships (Ingram et al., 2018; Wardell et al., 2021). These were, however, too small and uncoordinated to support a transition at scale.

Since REDD+, socio-technical landscape pressures (e.g., awareness about cocoa as a driver of deforestation, global market pressure for deforestation-free supply chains and insight into future climate threats) instilled a sense of urgency. Through platforms such as the CSCWG and

NRTWG, interests converged around CSC and landscapes as a potential pathway for not only reducing deforestation and sequestering carbon, but also for securing future cocoa production and improving livelihoods. GCFRP marks a critical change in thinking: from a farm and productivity focused approach with extension services centralised under COCOBOD to a climate-smart landscape approach with more private sector driven extension services and responsibilities beyond the farm. GCFRP also created a space for developing new institutional arrangements and incentive mechanisms for climate-smart cocoa and landscapes within the niche environment of the HIA.

The CSC Standard and the Climate-Smart Landscape Standard are central to GCFRP and HIA funding strategies. The CSC Standard was published in 2020¹⁴ (COCOBOD, 2020). While it does not radically depart from COCOBOD's earlier agronomic recommendations, it does provide more granular performance indicators that facilitate monitoring. Moreover, the Standard takes the earlier recommendation of 15–18 shade trees per ha (CHED and WCF, 2016) a step further by recommending 15–25 permanent shade trees per ha in areas with limited climatic threat and 25–50 in areas with high climatic threat (COCOBOD, 2020). The CSC Standard does not replace farm-level certification and will be an add-on instead. For the Climate-Smart Landscape Standard, the international Landscape sustainability assessment framework and verification mechanism¹⁵ is pilot tested in Juabeso-Bia HIA. The LandScale standard will complement COCOBOD's CSC Standard since it can assess impacts beyond the farm and enable marketing of CSC. The idea is that cocoa beans produced in 'certified' climate-smart landscapes can be branded as CSC (NCR, 2018).

At the time of research, the feasibility and marketability of climate-smart and deforestation-free cocoa beans were being studied. It is, therefore, still unclear whether a price premium can be obtained and whether these will sufficiently incentivise farmers to change practices. In the past, premiums for certified cocoa have rarely been welfare enhancing, nor motivated significant farm-level investments (Carodenuto, 2019; Ingram et al., 2018). Since a share of the price premium will be allocated to HIA implementation, price premiums alone are not expected to transform existing practices. However, they can incite regime shifts when combined with CSC engagement packages, tree registration support and crop insurance. Since many of these initiatives are still under development, it is too premature to draw conclusions. Progressing from pilots to scaling will also be challenging since the partnership base will need to be enlarged and much more financial resources should be unlocked.

Arguably, the main change to the cocoa regime is private sector integration into HIA institutional structures. This has helped align private and public services and strategies and encouraged the private sector to think 'beyond the farm'. By giving cocoa and chocolate companies a leading role in HIA consortia, GCFRP intends to leverage their CFI commitments. COCOBOD's central role in the value chain has though remained intact, remaining responsible for marketing, price setting, quality control and government extension programmes. Rather, its position has been strengthened since its policies are now supported by HIA management plans and bylaws. The bylaws from the Juabeso-Bia sub-HIAs require cocoa farmers to follow COCOBOD-recommended production practices and even prohibit farmers from declining government-initiated rehabilitation of diseased or overaged cocoa trees (3PRCL,

2020). On the HIA-level, COCOBOD is now though more collaborative since it now needs to engage with the HIA Management Board and align its operations with other HIA partners.

First results from CFI demonstrate that cocoa and chocolate companies have made progress distributing inputs and shade trees, training farmers, and mapping farms. Community engagement is, however, lagging behind (CFI, 2020). In the time of study, only a handful of multi-nationals, e.g., Touton, Mondelez, Olam and Hershey, were involved in establishing the HIAs (FC, 2021). As a result, most interventions have focused on their sourcing areas. While they include some of the largest cocoa and chocolate companies in the world, true transformation though requires considerably greater reach than these companies can offer. To reach the projected 51% private sector contribution to GCFRP implementation funding requirements (US\$121 million) (FC, 2016), more private sector actors, therefore, must buy into and align their activities with HIA plans.

4.3.3. Alignment of cocoa and forestry regimes

Changes to Ghana's cocoa and forestry regimes contributed to regime alignment, as is reflected in increasing policy coherence and inter-sectoral coordination (Fig. 7). The multi-level institutional structure of REDD+ allowed for increased coordination between government agencies and implementing partners both within GCFRP and between GCFRP and other related programs, while enhancing awareness about the importance of forest conservation.

The joint leadership of GCFRP by FC and COCOBOD has been cited by many as a major turning point and a first step towards resolving conflicting policy objectives. Before 2010, COCOBOD and FC rarely interacted, with output-oriented cocoa policies exacerbating deforestation. The agencies worked in siloes in partially overlapping but misaligned jurisdictions. Forest districts were not aligned with cocoa districts, nor with administrative districts or traditional authority stool lands, which complicated effective cooperation. Defining new jurisdictions for the HIA around multiple districts has helped mobilise each actor at the relevant scale. Moreover, to ensure policy alignment, representatives from FC and COCOBOD have been included in all the main GCFRP governance bodies: the GCFRP Steering Committee, GCFRP Joint Coordination Committee and Programme Management Unit and the HIA implementation committees (Fig. 5). Furthermore, since deforestation maps are highly political in Ghana, with various stakeholders questioning the validity of maps developed by other stakeholders, significant care was made designing a participatory process for developing baselines, a Forest Monitoring System and checks and balances.

The multi-level institutional structure also allowed for alignment between GCFRP and other international programmes such as FIP, CFI and the Voluntary Partnership Agreement of the EU Forest Law Enforcement, Governance and Trade (VPA-FLEGT) and national policies such as the National Climate Change Policy and Ghana's Forest Plantation Strategy (2016–2040). Whereas both FIP and CFI are hosted by the Ministry of Lands and Natural Resources instead of the FC, they are directly aligned with GCFRP objectives and jurisdictions (Republic of Ghana, 2018). CFI increases coordination between company sustainability efforts, facilitated by neutral conveners Sustainable Trade Initiative and the World Cocoa Foundation. FIP has contributed to some of the institutional arrangements described in Section 4.2.2 such as the Social and Environmental Safeguards and timber benefit sharing mechanism. VPA-FLEGT has supported efforts to reduce illegal logging (Ochieng et al., 2013) and laid the foundations for extending tree tenure rights to communities and farmers (O'Sullivan et al., 2021). Hence, the regime change and alignment that is observed is a product of the combined efforts of these and other programmes and not REDD+ alone.

At the HIA level, the governance model necessitates a high level of coordination and co-management by HIA Consortium partners. In Juabeso-Bia, several stakeholders are aligning their activities with and mobilizing around GCFRP. Solidaridad and Tropenbos Ghana, for instance, developed community platforms to raise awareness about

¹⁴ The Standard was developed by COCOBOD in collaboration with representatives of the Rainforest Alliance, WCF, Touton and FC (COCOBOD, 2020).

¹⁵ The development of LandScale is led by Rainforest Alliance, Verra and Conservation International and it is being tested in approximately 20 landscapes across the world. As opposed to traditional sustainability standards, it goes beyond a single crop or value chain to assess the "cumulative impact of all natural resource-based economic activities within the landscape, including agribusiness, forestry, extractives, infrastructure, and tourism" (Landscape, 2020).

social and environmental safeguards and work with communities and traditional authorities on land tenure issues. Ghana's National Cocoa Rehabilitation Programme that aims to replant old and diseased cocoa stands in line with the CSC Production Standard was also launched in Juabeso-Bia (Boadi, 2019). This illustrates that GCFRP has already succeeded in achieving the legitimacy needed to (up)scale its innovations and sustain itself going forward. At the same time, GCFRP requires a completely different way of working for regional FC and COCOBOD offices. The FC Climate Change Unit is an Accra-based institution and is dependent on regional FC Forest Service Division and Wildlife Division officers to implement GCFRP and coordinate with COCOBOD's regional officers and the HIA Management Board. While the structures are in place, the coming years shall demonstrate whether the social and organizational learning within these organisations can keep up with the national objectives.

5. Discussion

By offering an in-depth review of the jurisdictional approach employed by Ghana's REDD+ development process, this article contributes to the growing body of literature on integrated land management approaches. Inspired by MLP, it examined how socio-technical landscape pressures and innovation niches contributes to systems change. In doing so, we demonstrate how integrated planning approaches and broad-based participation has helped shift and align Ghana's cocoa and forestry regimes, while reconciling competing economic, social, and environmental interests. In this section, we discuss the pivotal role of shared purpose and polycentric governance as enabling conditions for GCFRP and broader institutional change (5.1) and the remaining challenges to effective regime change to enable climate-smart landscape transitions (5.2).

5.1. Shared purpose and polycentric governance

Almost 10 years after REDD+ was introduced in Ghana, GCFRP is now coming off the ground. The emergence of strong coalitions of public, private, and civil actors with context-relevant knowledge and expertise provided the necessary momentum. Through an iterative process of national level policy making and HIA-level piloting and implementation, GCFRP developed into one of the most promising cross-sectoral, multi-stakeholder programs of its kind. With forestry and cocoa stakeholders alike united by shared purpose, recognizing the need for scaling CSC practices, a shared vision for GCFRP's helped propel it into a program of national and global significance. Importantly, the program development process helped transform perspectives on cocoa in Ghana. Now, the sector is no longer strictly viewed as a driver of deforestation, but a pathway for carbon sequestration and sustainable land use.

GCFRP has a unique polycentric governance model that facilitates coordination between multiple centres of decision-making (Nagendra and Ostrom, 2012; Ros-Tonen et al., 2018), while building on pre-existing customary land and resource rules and community management structures (Adeyanju, 2021; Foli et al., 2018). HIAs also served as important innovation niches for developing new incentive mechanisms and institutional arrangements supportive of a climate-smart transition within and beyond the HIA. The governance model permits broad-based stakeholder participation and has encouraged many development stakeholders to embed their activities within HIA structures. Conversely, nesting HIAs within national policy initiatives and programs helps feed niche innovations into national processes and contributes to developing enabling structures that buttress (out-scaling of) jurisdictional approaches. More generally, the institutional structures in which HIAs are embedded have allowed for the horizontal and vertical coordination needed for regime shifts.

5.2. Remaining challenges

Our analysis shows, however, that even though Ghana made progress aligning land use policies and interventions and resolving forestry and cocoa regime contradictions, conflicting interests and path-dependencies still stand in the way of a full-fledged regime change. In this section, we discuss the primary outstanding challenges that, if left unaddressed, may constrain successful implementation of the GCFRP and jurisdictional approaches elsewhere.

5.2.1. Tree tenure reform

Like large-scale sustainability actions elsewhere, Ghana's REDD+ program contends with vested ministerial/sectoral interests. This is especially pertinent in the forestry regime, where – despite a plethora of programmes aimed at strengthening forest laws and enforcement capacities – the economic and political interests of administrative and political elites and timber companies, some of which dating back to the colonial era (Hansen and Lund, 2017; Wardell and Lund, 2006), have stalled efforts to reform timber management and benefit-sharing regimes (NCRC, 2020). To date, sectoral actors are yet to agree on the shares of timber revenue for farmers and communities, with early experiences with the tree registration suggesting such innovations may be too bureaucratic and costly to scale (NCRC, 2020).

Unfavourable land and tree tenure policies (Boyd et al., 2018; Kus-ters, 2015) and inequitable community benefits sharing (Sayer et al., 2013) have been identified as major institutional barriers for delivering on social and environmental objectives through integrated landscape approaches. As we demonstrate, community-based natural resource management and farm-level tree management are cornerstones of the GCFRP approach. Failing to equitably share benefits threatens to undermine the perceived legitimacy of the programme amongst local communities and its ability to deliver on Ghana's international commitments. Resolving these issues likely requires executive actions beyond the ministerial remit.

5.2.2. Moving beyond carbon finance

A distinguishing feature of Ghana's REDD+ programme is its commodity-centric approach. This has proven strategic in helping leverage private sector commitments and capital. While focusing on a single commodity risks simplifying the complexity of land use decisions and the interplay between different commodity sectors, commodity-centric initiatives are arguably well positioned to broaden their scope when they are financially self-sufficient and structures for integrated planning, management and monitoring are already in place. However, since shared purpose emerged from economic imperative (e.g., declining competitiveness of Ghanaian cocoa as a result of climate change), the cocoa sector is arguably 'low hanging fruit'. In contexts without a dominant sector that needs to evolve to survive, achieving broad-based commitments is likely challenging. Other sectors where the economic imperative for change is less pronounced may not be able to reach the same level of political support and institutional innovation as Ghana's cocoa sector. This may especially be the case for sectors with a strong domestic focus and fewer downstream/consumer pressures. Furthermore, in more economically diversified landscapes, vested interests will arguably be higher given the competition over land resources, with a multi-sectoral approach requiring, and possibly being constrained by, more complex and charged negotiations over competing land uses.¹⁶ Future research is needed to understand the design challenges in such sectors and landscapes.

It is too early to conclude whether institutional innovations in Ghana will produce intended outcomes (e.g., forest preservation, decreased GHG emissions, increased carbon stock, CSC, and improved livelihoods).

¹⁶ See for instance Hiron (2013) for a discussion on the interlinkages between forestry and mining.

Nevertheless, our research does yield some valuable insights. The first relates to funding streams and incentive mechanisms. The blueprint for the HIA governance model developed by 3PRCL foresees several financing streams beyond just carbon finance, including CSC premiums, landscape finance and project funding from private sector, NGO, and government initiatives. This resource blend enhances HIA responsiveness to changing funding conditions and opportunities and will make HIAs less susceptible to REDD+ funding issues (Duchelle et al., 2018; Gizachew et al., 2017) and donor project cycles. Lack of long-term funding was one of the main barriers to success of the CREMA model in the past (Baruah et al., 2016; Murray et al., 2018) and is experienced by many integrated landscape approaches and REDD+ projects across the world (Boyd et al., 2018; Brockhaus et al., 2017; Reed et al., 2020).

However, some of the potential funding streams listed in the HIA governance blueprint are still theoretical. While progress has been made developing climate-smart cocoa and landscapes standards (NCRC, 2020), these are yet to prove effective in generating price premiums. Experience from other sectors demonstrates that premiums from certification are negligible (DeFries et al., 2017), often not outweighing compliance costs incurred by farmers (Mithöfer et al., 2017). Returns on cocoa production have decreased for decades and rarely provide a living income (van Vliet et al., 2021). Together, sustainable intensification, credit and saving facilities, crop insurance and potential income from shade trees may help change this, but informal income from timber and non-timber forest products may at the same time decline due to increased formalisation and monitoring (Hirons et al., 2018; Maguire-Rajpaul et al., 2021). The development of alternative livelihood programmes may offer reprieve, though NGOs active in the area question availability of economically viable alternatives (see also Adeyanju, 2021; Roe et al., 2015). This should be carefully monitored in future.

5.2.3. Inclusive decision-making and equitable benefit-sharing

Efficacy of Ghana's REDD+ programme is also contingent on changes to informal institutions. New formal rules and regulations rarely translate to better practices if these are not integrated into customary norms and laws (Hodgson, 2006). The formal institutions developed under GCFRP may clash with local values and beliefs, which change at a much slower pace since these are deeply engrained in people's preferences and habits (Geels, 2004; Hodgson, 2006). For example, years of promotion of full-sun cocoa by COCOBOD has fuelled the belief that full-sun cultivation is better than cocoa agroforestry (Gockowski et al., 2011; Ruf, 2011). Similarly, due to pervasive tenure insecurities many farmers are reluctant to replant overaged cocoa stands for fear of losing their land once trees are cut (Asaaga et al., 2020; Hansen et al., 2009). Continued long-term engagement is necessary to address such issues, solve disputes and build trust. Undemocratic decision-making, unequal benefit-sharing and externally imposed objectives have fuelled mistrust in CREMA in the past (Adeyanju et al., 2021; Baruah, 2017; Bempah et al., 2019; Gilli et al., 2020). This has undermined their perceived legitimacy and thereby their effectiveness in achieving environmental and social change. The climate-smart agriculture agenda has been criticised for being hijacked by multinational corporations to serve their global supply and reputational agendas, undermining communities' autonomy and ignoring local differences in access and aspirations (Carodenuto, 2019; Maguire-Rajpaul et al., 2021; Nasser et al., 2020).

Just like in other integrated landscape initiatives, tension also remains between safeguarding HIA autonomy and inclusivity and meeting the needs and performance targets of donors and national-level policies (Reed et al., 2017; Saeed et al., 2018). As the HIA development and implementation process unfolds in the coming years, inclusion of marginalised groups such as migrants and women in decision-making and benefit-sharing should be closely monitored. Only when local communities co-own the HIA process and adjust their practices accordingly can we speak of effective regime change.

6. Conclusion

The GCFRP innovation process has demonstrated how socio-technical landscape pressures emanating from REDD+ discourse and funding, scientific knowledge on the effects of climate change on cocoa, and international zero-deforestation commitments have enabled formation of strong multi-stakeholder coalitions and encouraged numerous institutional innovations. Our study highlights the importance of shared purpose in instilling the urgency and creating the common language needed to overcome sectoral siloes and inertia. It also reveals how GCFRP's polycentric governance model – based on community-based natural resource management, supported by public and private actors and nested within national policy frameworks – helped leverage broad-based engagement and funding.

After two years of implementation, early signs of regime change and alignment can be observed. Despite this, effectiveness is threatened by frustrated reforms to tree tenure and timber benefit-sharing rights. Our research demonstrates that political commitment for institutional change beyond landscape and jurisdictional scales is essential to enable climate-smart landscape transitions. In the coming years, it will become clear whether the current political commitment and coordinated action can be sustained long run and whether the incentive mechanisms at the heart of the programme will materialise and stimulate uptake of better cocoa practices and natural resource management.

CRedit authorship contribution statement

Selma van der Haar: Conceptualization, , Formal analysis, Visualization, Methodology, Visualization, Writing – original draft. **Cees Leeuwis:** Writing – review & editing. **Maja A Slingerland:** Writing – review & editing. **George Christoffel Schoneveld:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Emily Jeanne Gallagher:** Investigation, Writing – review & editing, Conceptualization, Methodology.

Declaration of Competing Interest

The authors have no competing interests to declare.

Data availability

The authors do not have permission to share data.

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6.1. Government

- Cocoa Marketing Board Ghana (COCOBOD) – Cocoa and Health Extension Division (CHED)* – National and Bia-West
- Forestry Commission: Climate Change Directorate (CCD)* ; Forest Service Division (FSD) – National and Juaboso; Wildlife Division (WD) – Bia
- Ministry of Agriculture – Juaboso and Debiso
- Planning Office – Juaboso.

NGOs: Agro Eco* ; NCRC* ; Rainforest Alliance; SNV Netherlands Development Organisation*; Solidaridad; Sustainable Trade Initiative (IDH); Tropenbos International Ghana.

Private sector: Cargill; Mondelez; Olam – National and Sefwi-Wiawso; Partnership for Forests (P4F); ProForest; Satelligence; Touton* – National and Bonsu Nkwanta; World Cocoa Foundation.

6.2. Community representatives

- Asuopri CREMA and (sub-)HIA Executive Committee members and 1 HMB member (group interview);
- Juaboso CREMA and sub-HIA Executive Committee members (group interview);
- Krokosua CREMA and (sub-)HIA Executive Committee members (group interview).

Traditional authorities: Asempanaye Chief; Essam Chief; Krokosua Chief; Sefwi-Wiawso Paramount Chief.

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