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To what extent is REDD+ integrated into land use sectors driving deforestation? Insights from Cameroon

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Abstract

Environmental policies ought to be integrated into economic sectors for successful outcomes. We assess to what extent Reducing Emissions from Deforestation and forest Degradation (REDD+) is integrated into land-use sectors driving deforestation in Cameroon. REDD+ governance has been extensively examined, including the challenges of a multisectoral approach to tackle the drivers of deforestation, especially those lying outside the forestry sector. Yet, these studies have focussed on cross-sectoral coordination, giving little attention to factors such as political will and the adequacy of policy instruments for integration. We amend and apply an innovative framework for environmental policy integration to conduct a comprehensive assessment of REDD+ policy integration in Cameroon, a Congo Basin country experiencing increasing deforestation rates due to agriculture, husbandry, infrastructure development and mining. Drawing from policy documents and in-depth interviews with key informants, we found out that territorial battles between ministries, insecurity about their understanding of forest matters in different land-use sectors, and dysfunctional policy instruments have undermined REDD+ policy integration. Our study suggests that REDD+ integration into land-use sectors would be enhanced by informing stakeholders about their roles in the REDD+ process, completing and legitimising the forest zoning plan, addressing loopholes in environmental assessment regulations, and alleviating inconsistencies in land-use rules. These instruments would be reinforced with an economic tool internalising carbon costs in projects generating forest emissions.

Keywords: REDD+, Deforestation, Environmental Policy Integration, Land-use sectors, Cameroon

1. Introduction

Climate change is widely acknowledged as one of the most pressing and defining threats of our time. Human-induced global warming has led to profound alterations to human and natural systems, marked by increases in the frequency and intensity of droughts, floods, and biodiversity loss (IPCC, 2019). The adverse impacts on water supply, food security, health, livelihoods, human security and the overall economy have been manifest worldwide and are predicted to intensify with projected global warming of 1.5°C to 2°C (IPCC, 2019). Forest clearing accounts for 12–22% of global carbon emissions, driven by demographic and economic fostering of land conversion for agriculture, logging, mining, and infrastructure building (Gupta et al., 2013; IPCC, 2023). Reducing Emissions from Deforestation and forest Degradation (REDD+) emerged under the United Nations Framework Convention on Climate Change (UNFCCC) to financially compensate and support forest-rich developing countries in mitigating forest emissions (Bhattarai et al., 2023; Nketiah et al., 2023). REDD+ deployment across implementing countries occurs in three phases: the readiness, implementation, and payment phases. National REDD+ strategies are designed in the readiness phase, implemented in the second phase, resulting in a change in forest areas and carbon stocks to be measured and compensation is paid for in the third phase (UNFCCC, 2016). Alongside other countries of the Congo Basin, the world's second largest rainforest currently experiencing increased deforestation, Cameroon appeared as a prime location for REDD+ (Brown et al., 2011).

As has been the case for scientifically informed global environmental agendas set to permeate multiple layers of decision-making, REDD+ has been expected to encounter diverging interests, from global expectation for carbon mitigation to national aspirations for economic growth (Mustalahti et al., 2012; Kissinger et al., 2021) . With most REDD+ countries currently transitioning from the first to the second phase of REDD+ development, assessing to what extent forest considerations are woven into economic or land use sectors driving deforestation informs policy reforms which improve REDD+ performance (Nkem et al., 2010; Weatherley-Singh & Gupta, 2017). Integrating REDD+ policy objectives into land use sectors has proved challenging in tropical countries (Korhonen-Kurki et al., 2016; Kemigisha et al., 2023). Almost unanimously, REDD+ scholars have warned that REDD+ integration is challenged by sectoral coordination problems, advising policy reforms and participatory governance approaches (Peskett & Brockhaus, 2009; Gupta et al., 2016; Korhonen-Kurki et al., 2016; Špirić & Ramírez, 2021); but is there sufficient political backing and appropriate policy instruments to achieve integration? Incorporating REDD+ into a broader land use context

would seldom be attained without dedicated policy instruments and staunch support at higher governance levels and among land use stakeholders (Runhaar, 2016; Weatherley-Singh & Gupta, 2017). Yet stakeholders' backing for REDD+ integration and their adoption of adequate policy instruments have received little scrutiny in existing REDD+ integration studies; on the other hand, existing surveys of the discursive practices of REDD+ stakeholders have instead focused on their perception of REDD+ benefits sharing, equity, carbon monitoring, and finance (Di Gregorio et al., 2013; Tiani et al., 2015; Vijge et al., 2016). We fill this gap in our assessment of the extent to which REDD+ policy objectives are integrated into land use sectors driving deforestation beyond the forestry sector in Cameroon, namely agriculture, livestock, infrastructure, and mining. We scrutinise the political will of state actors through which policy integration occurs, and the policy instruments that support the integration process. More specifically, the paper evaluates sectoral REDD+ integration through these four research questions: i) To what extent do state actors view or frame deforestation - the source of forest emissions - as an intersectoral problem to be addressed across land use sectors? ii) To what extent are the various land use sectors involved in addressing forest clearing? iii) What is the magnitude of coordination challenges among land use sectors in Cameroon? iv) To what degree are existing policy instruments conducive to REDD+ policy integration?

In the next section, we undertake a conceptual review of the notion of Environmental Policy Integration (EPI) that underlies this research, provide a background review of EPI frameworks, then select and describe the components of the appropriate one applied to evaluate REDD+ integration in our case study. Next, the existing literature on REDD+ policy integration is reviewed and assessed against the selected EPI framework to reveal the gap filled by this study, which then permits to amend the framework. Subsequently, the methodological approach is laid out, which introduces the study area, landscapes the Cameroonian forest context as well as competing land use sectors, then spells out our data collection and analytical choices. The findings structured around the components of the EPI framework selected are next exposed and discussed, leading to pathways to advance REDD+ policy integration and directions for future research.

2. Environmental Policy Integration: a framework for analysis

2.1. Conceptual background and clarification

EPI traces back to landmark documents on sustainable development such as the 1987 Brundtland report and the 1992 Rio Summit Declaration that promote the inclusion of environmental considerations across sectors (WCED, 1987; Lafferty & Hovden, 2003). We understand EPI as incorporating environmental concerns into the decision-making of other sectors. EPI foreran the analogous notion of Climate Policy Integration (CPI) and although CPI builds on the theoretical understanding of EPI, it emphasises the dual dimensions of climate change mitigation and adaptation (Kengoum & Tiani, 2013; Di Gregorio et al., 2017) and engages a narrow set of sectors (Ahmad, 2009; Adelle & Russel, 2013). EPI research such as this work involves a wider range of sectors (Candel & Biesbroek, 2016).

2.2. A theoretical framework to assess EPI

This study amends an EPI framework from existing analytical tools reviewed in this section. Frameworks for EPI have increased in recent decades, theorising how EPI is conceptualised and executed. As outlined below, the literature classifies these into static and dynamic lenses (Nilsson & Persson, 2003).

One of the first practical EPI frameworks was introduced by Lafferty and Hovden (2003), and includes vertical and horizontal features of EPI. Horizontal integration assesses how far a central authority has developed a comprehensive cross-sectoral strategy for EPI, evident through indicators such as the existence of a long-term sustainable development strategy. Vertical EPI relates to individual sectors and measures the extent to which a particular governmental sector has adopted and sought to implement environmental objectives (Lafferty & Hovden, 2003). When Lafferty and Hovden's framework covers the breadth and depth of EPI, its reliance on the existence policy outputs poorly helps to distinguish instances where such outputs are still under development from those where no attempt at EPI is undertaken. Such has been the limitation of approaching EPI as a relatively static policy outcome, a desired state that is reached or else EPI is deemed inexistent (Candel & Biesbroek, 2016). Such obliteration of the differentiated nature of policy integration explains the shift to a more dynamic and processual framework for EPI.

Several examples of the dynamic conceptualisation of EPI emerged, which introduced diverse degrees of sectoral coordination ranging from independent decision-making by ministries to shared government strategies, in between which distinct steps were distinguished (Metcalfe,

1994; Keast et al., 2007). While these have provided a logical order of how integration may increase or regress over time and thus offer a tool for comparison, they lack clear criteria or elements on the basis of which degrees could be distinguished (Candel & Biesbroek, 2016). Building on these early frameworks, Candel and Biesbroek (2016) introduced a theoretical approach that accommodates the dynamic and processual nature of the integration process and would therefore underpin our assessment of REDD+ integration into land use sectors driving deforestation.

2.3. Candel and Biesbroek's processual framework for EPI assessment

Candel and Biesbroek (2016) frame EPI as a process of policy and institutional change where actors, the medium for integration, play a central role. Their framework consists of four distinct but interrelated dimensions of policy frame, subsystem or sector involvement, policy goals, and policy instruments.

The *policy frame* refers to the dominant definitions of a societal issue at the macro level (Candel & Biesbroek, 2016). Lack of political will for integration has been identified as a constraint to environmental mainstreaming (Dalal-Clayton & Bass, 2009). This dimension evaluates the level of political support for environmental integration by capturing the extent to which a cross-cutting problem such as forest clearing is perceived at macro level as requiring multisectoral governance; this could be articulated in foundational documents or statements (Candel & Biesbroek, 2016). Reflecting the processual and differential nature of integration, the framework introduces four degrees of manifestation of the policy frame that assess the extent to which an environmental problem is integrated within a governance system (Table 1).

Table 1: Manifestations of the policy frame (Candel & Biesbroek, 2016)

Low amounts of policy integration			High amounts of policy integration
Stage 1	Stage 2	Stage 3	Stage 4
The problem is defined in narrow terms within the governance system; the cross-cutting nature of the problem is not recognised and the problem is considered to fall within the boundaries of a specific subsystem (sector).	There is awareness that the policy outputs of different subsystems shape policy outcomes. The problem is still predominantly perceived as falling within the boundaries of a particular subsystem.	Increasing awareness of the cross-cutting nature of the problem, and understanding that the governance of the problem should not be restricted to a single domain.	General recognition that the problem is and should not solely be governed by subsystems, but by the governance system as a whole.

EPI also requires that environmental concerns are on the political agenda of sectoral administrations (Hertin & Berkhout, 2003). The *subsystem or sectoral involvement* refers to

the range of sectors or actors engaged in the governance of a cross-cutting problem when it arises on the political agenda. It is conceptualized along the sub-dimensions of *subsystems or sectors involved* and *interaction density.* The first assesses the range of sectors engaged in governing the problem, as determined by the extent of their awareness of its cross-cutting nature and their sense of responsibility in addressing the problem. The second captures the level of interaction among sectors, the frequency of which facilitates integration (Table 2).

Table 2: Manifestations of subsystem or sector involvement (Candel & Biesbroek, 2016)

Low amounts of policy integration			High amounts of policy integration
Row 1-Subsystems or sectors involved			
Stage 1	Stage 2	Stage 3	Stage 4
One dominant subsystem or sector, which governs the issue independently.	Subsystems recognize the failure of the dominant subsystem to manage the problem and externalities, which results in the emergence of concerns about the problem in one or more additional subsystems.	Awareness of the problem's crosscutting nature spreads across subsystems, as a result of which two or more subsystems have formal responsibility for dealing with the problem.	All possibly relevant subsystems have developed ideas about their role in the governance of the problem.
Row 2-Density of interactions			
No interactions	Infrequent information exchange with dominant subsystem.	More regular and formal exchange of information and coordination.	High level of interaction between formally involved subsystems.

Sectoral engagement occurs when environmental objectives are incorporated into sectoral policy goals. The third dimension of *policy goals* reflects the range of sectoral policies that explicitly adopt cross-cutting problems as goals, as well as the coherence between environmental and sectoral policy goals (Table 3).

Table 3: Manifestations of policy goals (Candel & Biesbroek, 2016)

Low amounts of policy integration			High amounts of policy integration
Row 1-Range of policies in which the cross-cutting problem is embedded			
Stage 1	Stage 2	Stage 3	Stage 4
Concerns only embedded within the goals of a dominant subsystem.	Concerns adopted in policy goals of one or more additional subsystems.	Possible further diversification across policy goals of additional subsystems.	Concerns embedded within all potentially relevant policy goals.
Row 2-Policy coherence			
Very low or no coherence. Occurs when cross-cutting nature is not recognized, or when subsystems are highly autonomous in setting (sectoral) goals.	Because of rising awareness of externalities and mutual concerns, subsystems may address these to some extent in their goals.	Coordinated sectoral goals, which are judged in the light of coherence. Subsystems attempt to develop synergies	Shared policy goals embedded within an overarching strategy.

Policy coherence relies on the effectiveness of the mix of instruments designed for the purpose. Adequate *policy instruments* are needed at subsystem and system-levels to harmonize environmental and sectoral policy goals. Policy instruments constitute the fourth EPI dimension and can be substantive or procedural. Substantive instruments allocate financial, regulative or organisational resources to directly support EPI, and procedural instruments indirectly influence outcomes by shaping policy processes (Candel & Biesbroek, 2016). EPI tools could include sectoral strategies, green budgeting, interdepartmental working groups, environmental assessment, and environmental correspondents in sector departments (Jacob & Volkery, 2004). The dimension of policy instruments is assessed through three indicators: (i) instrument deployment at system level to coordinate subsystems or sectors' efforts, (ii) the range of subsystem or sectoral policies that adopt policy instruments to address the cross-cutting problem, and (iii) the consistency of policy instrument mixes (Table 4).

Table 4: Manifestations of policy instruments

Low amounts of policy integration			High amounts of policy integration
Row 1-Policy instruments at system-level			
Stage 1	Stage 2	Stage 3	Stage 4
No relevant instruments at system-level.	Some information sharing instruments at system-level.	Increasing number of system-level instruments that facilitate subsystems to jointly address the problem.	Broad range of instruments at system-level that coordinate, subsystems' efforts .
Row 2-Range of subsystem or sector policies that contain policy instruments			
Problem only addressed by the instruments of a dominant subsystem.	One or more additional subsystems (partially) adapt their instruments to mitigate negative effects.	Possible further diversification of instruments addressing the problem across subsystems.	Instruments embedded within all potentially relevant subsystems and associated policies.
Row 3-Consistency of policy instruments			
No consistency. Sets of instruments are purely sectoral and result from processes of policy layering.	Subsystems consider externalities of sectoral instrument mixes in light of internal and inter-sectoral consistency.	Subsystems seek to jointly address the problem by adjusting and attuning their instruments.	Full reconsideration of subsystem instrument mixes, resulting in a comprehensive, cross-subsystem instrument mix.

These three indicators have focused on the range of sectors that embed instruments, when EPI effectiveness eventually rests on their implementation. We have, therefore, added a supplementary indicator that assesses the extent to which existing policy instruments are implemented (Table 5).

Table 5: Manifestation of policy instrument implementation

Policy instrument implementation			
Stage 1	Stage 2	Stage 3	Stage 4
There is no or substantial implementation deficit of policy instruments at system and subsystem levels.	A marginal proportion of sectors apply a few integration instruments to some extent.	Decision-making at system level and within several subsystems is increasingly guided by a sizeable mix of policy instruments.	There is consistent and regular use of a broad range of instruments with regular reporting across most to all relevant sectors.

We apply the amended framework to assess REDD+ policy integration within competing land use sectors in Cameroon, filling a major research gap in the literature reviewed below.

3. REDD+ integration viewed through an EPI lens

The imperative of integrating solutions to forest emissions into land use sectors at the origin of deforestation sparked research interest on REDD+ policy integration. Most studies have taken a static approach at EPI and many equate integration to sectoral coordination, which constitutes only one subdimension in Candel & Biesbroek's four-pronged conceptualisation of EPI.

Sectoral coordination challenges stemming from overlapping institutional boundaries and policy inconsistencies are widely reported across REDD+ countries (Fujisaki et al., 2016; Korhonen-Kurki et al., 2016). In Laos PDR, for example, a blurred division of responsibilities between the forestry and the natural resource departments strained institutional relations with detrimental implications for forest protection (Lestrelin et al., 2013). In Papua New Guinea, land lease allocations in the agricultural sector accelerated forest clearing at a pace contradictory to REDD+ objectives (Korhonen-Kurki et al., 2016). REDD+ development in Cameroon has also been marred by overlapping land titles across forestry, agriculture, and mining uses (Kengoum & Tiani, 2013). Forest encroachment seldom runs short when the quest for economic growth holds sway, highlighting the centrality of EPI in invigorating environmental considerations. REDD+ studies herald land zoning – allocating areas of land to specific uses – as a remedy to land use conflicts and key indicator of successful REDD+ governance (Pettenella & Brotto, 2012; Robiglio et al., 2014). Land use planning thus constitutes an important policy instrument for REDD+ policy integration into other land use sectors.

Policy inconsistencies have also brought about sectoral coordination challenges in REDD+ countries. Emissions associated with the use of chemical fertilisers involving a shift of greenhouse gases from deforestation to energy-intensive industrial processes in fertiliser factories, and the use of machinery to increase agricultural production have been found to undermine REDD+ (May et al., 2011; Kalaba et al., 2014; Atela et al., 2016) highlighting policy incoherence.

Efforts at sectoral coordination in REDD+ countries have been hindered by capacity deficit. In Vietnam, limited understanding of REDD+ strategy and how it relates to other government activities left sectoral actors puzzled, and financial shortages hindered sectoral outreach, restricting participation in REDD+ fora to forestry and REDD+ experts (Mcnally & Nguyen, 2016). The latter had been under political pressure to formalise a National REDD+ Action Plan to demonstrate success at COP meetings (Mcnally & Nguyen, 2016). Such "cosmetic" strategy (Mickwitz and Kivimaa (2007, p. 82) should be distinguished from genuine policy integration.

Our amendment of the fourth EPI dimension of policy instrument facilitates such distinction by including not just the range of policy instruments developed, but the extent to which these are actually implemented.

A common suggestion to enhance cross-sectoral coherence has been to encourage information exchange and inter-institutional learning among sectors (Korhonen-Kurki et al., 2016; Wurtzebach et al., 2019). This relates to the EPI subdimension of interaction density and highlights the role of communicative policy instruments. In REDD+ countries, different types of joint ministerial platforms such as REDD+ steering committees, inter-ministerial working groups, and task forces have been used to support cross-sectoral cooperation (Standing, 2015; Fujisaki et al., 2016; Korhonen-Kurki et al., 2016; Špirić & Ramírez, 2021), but they have not always successfully fostered integration. Powerful sectoral institutions often undermine the resolutions of these joint platforms (Resosudarmo, 2013; Korhonen-Kurki et al., 2016). Sectors' resistance to REDD+ platforms' push for integration raises questions about whether existing organisational arrangements are conducive to integration, whether REDD+ integration is endorsed at the macro level, and how sectoral actors frame forest clearing. Yet, other EPI dimensions, such as the policy frame and subsystems or sector's support, and the adequacy of policy integration instruments, have received little attention to date.

We address such shortcomings through a comprehensive analysis of REDD+ policy integration, improving and building on Candel and Biesbroek's framework. Our amendment of the framework draws from the above REDD+ policy integration literature which has focused on sectoral coordination. Although not its sole component, cross-sectoral coordination remains a fundamental EPI feature and yet is not included in the four dimensions of Candel and Briesbrook's framework. We added the dimension of sectoral coordination into the framework and subsumed the indicators of interaction density and coherence of goals under this dimension (figure 1). Finally, we subsume the criteria of the extent to which the problem is included in sectoral policy goals under the dimension of subsystem or sector involvement.

We apply this innovative framework to the forest-rich yet increasingly deforested Cameroon that joined the REDD+ initiative over a decade ago to curb forest clearing. Although this country has been included in multi-countries comparative analyses of sectoral coordination (Korhonen-Kurki et al., 2016) no research to date has specifically investigated REDD+ integration into all main land use sectors behind deforestation across all four key EPI dimensions in Cameroon. We adopt a processual and differentiated approach that assesses not

just whether REDD+ is integrated within concerned land use sectors, but also the extent to which it is. The next section outlines our methodological approach.

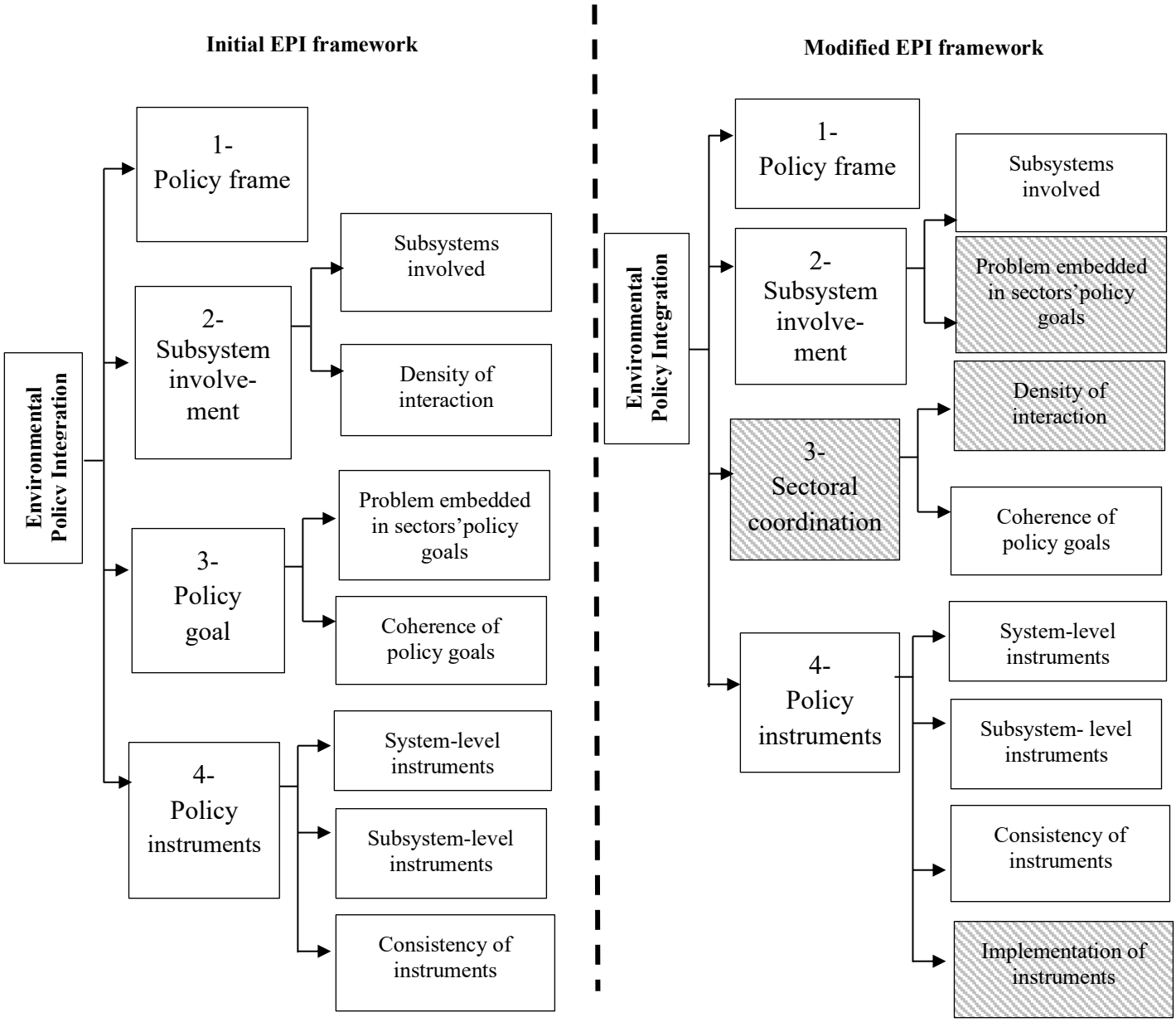

Figure 1: Adjusted framework for Environmental Policy Integration

4. Materials and methods

Cameroon's extensive forest under growing pressure from varied land uses and its adoption of the REDD+ mechanism to halt forest clearing makes it suitable to investigate REDD+ policy integration into land use sectors driving deforestation. Before outlining our methodological approach, we present the Cameroonian forest context and competing land uses.

4.1. Study area: Cameroon

Cameroonian forests: State and governance

Cameroon has about 22 million hectares of forest which plays key economic and socioecological functions. The Cameroonian forest contributes 4% to the GDP, ensure biodiversity preservation, water recycling, carbon capture, and is central to local livelihoods for wood provision and non-timber forest products such as fruits, tree bark and medicinal plants (MINFOF, 2013; Lhoest et al., 2019). The forest sector is governed by the 1994 Forest Law enforced by the Ministry of Forestry and Wildlife (MINFOF), and to some extent by the 1996 Environmental Framework Law overseen by the Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) (MINFOF, 2013; Mosnier et al., 2016). We consider MINFOF and MINEPDED as the main system-level institutions in our analyses.

REDD+ emerged to address the shortcomings of existing forestry regulations. The 1994 forest law sought to regulate and preserve the various functions of the forests; yet its enforcement has been undermined by resource and staff shortages consistent with the 1990s economic crisis that halted recruitments in the public sector (Mvondo, 2009). The ensuing poor legal compliance by timber operators prompted the European Union (EU), then leading destination of tropical timber to launch the Forest Law Enforcement, Governance and Trade (FLEGT) initiative, a Voluntary Partnership Agreement with timber exporting countries (Cerutti et al., 2016). FLEGT aimed to curb the flow of illegal timber into European markets; but after a decade of development, has been thwarted by disagreements between EU and the forestry administration fearing the erosion of their sovereignty over the country's forest (Cerutti et al., 2016; ATIBT, 2021). As a result, forest certification schemes took prominence but hardly fared better (Lescuyer et al., 2021). The low uptake of costly and complex certification schemes in tropical countries combined with the increased flow of timber to less stringent Asian markets foiled the effect of certification on sustainable forest management (Savilaakso et al., 2017; Karsenty, 2019). The continuous erosion of tropical forests amid heightening global concern about forest-based emissions and climate change prompted the introduction of market-driven instruments

including Payment for Ecosystem Services (PES). Unlike previous policy instruments, PES schemes such as REDD+ assign a monetary value to the environmental benefits of forests and broaden their scope beyond illegal logging within the forest domain to other land use sectors all the more responsible for deforestation (Buttoud, 2012). In Cameroon, the biggest pressure on forests emanates from land conversion to agriculture, livestock rearing, mining, and infrastructure development (MINEPDED, 2018). Thus, Successful REDD+ outcomes rely on integrating forest considerations into these land use sectors investigated in this study as sub-systems or sectors of interests.

Land use sectors driving deforestation and the response of REDD+

Studies of deforestation and forest degradation in Cameroon attribute anthropogenic deforestation to agricultural expansion, livestock husbandry, logging, mining, and infrastructure development (MINEPDED, 2018). Land use sectors driving forest clearing form the backbone of the country's economy (GESP, 2009). Agriculture accounts for 20% of the national GDP; the country's agroecological diversity accommodates a wide range of crops including cereals, tubers, oleaginous, and cash crops such as cocoa and coffee (MINADER, 2014). Farming in Cameroon is essentially traditional involving slash and burn shifting practices (MINADER, 2014). The husbandry sector is equally predominantly traditional, employing 30% of the rural population (MINEPIA, 2011). Traditional livestock rearing dominates in the Sahelian North where fire use for feed regeneration causes deforestation (MINEPIA, 2011; Gakou-Kakeu et al., 2022). Infrastructure development is also detrimental to forests (Tchatchou et al., 2015); after a delay during the economic recession, substantial investment has been committed into infrastructure expansion, which has come at the expense of forests. Transportation facilities are crucial to unlock the country's mineral potential; yet mineral extraction in forestlands drives forest clearing (KPMG, 2014; Kamga et al., 2019).

In this context of growing pressure from different land use sectors, REDD+ emerged as a financial mechanism to foster forest protection. In Cameroon, a multisectoral Steering Committee was set up within the environmental department to oversee the design of the national REDD+ strategy aiming to achieve net zero deforestation by 2035 (MINEPDED, 2018). Evidently, successful outcomes rest on whether such a policy objective is incorporated in policies and practices in the land use sectors driving deforestation (Korhonen-Kurki et al., 2016). The main national state institutions related to these sectors outside the forest department include the Ministry of Agriculture and Rural Development (MINADER) that oversees the 2014 agricultural policy, the Ministry of Livestock, Fisheries and Animal Industries

(MINEPIA) in charge of the 2011 livestock strategy, the Ministry of Public Work (MINTP) responsible for the infrastructure development strategy, and the Ministry of Mines, Industry and Technological Development (MINMIDT) that implements the mining policy. The section below outlines our methodological approach.

4.2. Data collection and analytic methods

We draw from a mix of policy analysis and in-depth interviews (Byrne, 2012) with key informants to explore the four research questions through related EPI dimensions of problem framing by state actors, subsystem or sectoral involvement, sectoral coordination and policy instruments, in the context of REDD+ policy integration in Cameroon. The first research question on the framing of forest clearing by state actors at the central governance is assessed through in-depth interviews with decision-makers from MINFOF and MINEPDED, the system-level bodies. Their framing reflects political support for integration. Interviews are complemented with a systematic review of forestry and environmental legislation and policy documents, as well as broader development policies to interpret decision-makers' framing of the problem of deforestation and support for REDD+ integration. Interviews enabled us to probe their awareness of the cross-cutting nature of forest clearing and the extent to which they endorse a multisectoral approach to address deforestation. The second research question related to the EPI dimension of subsystem or sector involvement is assessed through a sectoral policy review and in-depth interviews with policy-makers from the departments of agriculture, animal husbandry, public work and mining. They shared their perceptions of forest clearing and the extent to which forest protection is integral to their department goals. Their accounts on their interactions with other sectors and coherence with system level and other land use policies informed our assessment of the third research question on the extent of sectoral coordination challenges. Lastly, policy document review and participants' views about the availability and implementation of policy instruments guided our assessment of the fourth research question on the availability and suitability of policy instruments. Sixteen policy documents were systematically reviewed and nine in-depth interviews were conducted with purposively selected (Carpenter & Suto, 2008) national level decision-makers holding leadership positions in administrative units directly linked to deforestation and forest degradation (Table 6). To comply with ethical standards, we have kept their names and professional roles confidential.

Table 6-Research design

EPI sub-dimensions	Questions	Data sources	
		Policy documents	**Interviewees**
Dimension 1: Policy frame			
/	How is deforestation framed in the Cameroonian governance system?	**System-level policies:** ➢ **Forest** -1994 Forest and Wildlife Law -Decree 95/466 on wildlife provisions -Decree 95/531 on forest provisions -2020 Forest and Wildlife Strategy - 2009 Growth and Employment Strategic Paper -2020 National Development Strategy ➢ **Environment** - 1996 Environmental Framework Law -Decree 2001 on the Interministerial Committee on the Environment -Decree 2013 on Environmental and Social Impact Assessments - Order 0070 on Operations subject to ESIA ➢ **REDD+**: -2018 National REDD+ Strategy	**System-level participants:** 1 representative from -MINFOF -MINEPDED -3 representatives from REDD+ Steering Committee
Dimension 2: Subsystems/sectors involvement			
Subsystems/sectors involved	How is forest clearing framed within the sectors of agriculture, animal husbandry, public work, and mining?	**Subsystem/sector-level policies:** - 2014 National Agricultural Investment Plan - 2011 Strategy Document for the sub-sector of Livestock, Fisheries, and Animal Industries -2012 Infrastructure Development Strategy -2016 Mining Code - Mining Strategy	**Subsystem/sector-level participants:** 1 representative from: -MINADER -MINEPIA -MINTP -MINMIDT
Problem embedded in sectoral policy goals	What range of sectoral policies includes forest protection as a goal?	Subsystem/sector-level policies (see list in above cell)	
Dimension 3: Sectoral coordination			
Density of interactions	What departments do each sector interact with and how often?	-System-level policies (see list in dimension 1 above) -Subsystem/sector-level policies (see list in dimension 2 above)	-System-level participants (see list in dimension 1 above) -Subsystem/sector-level participants (see list in dimension 2 above)
Coherence of policy goals	To what extent are land use policy goals coherent?	-Subsystem/sector-level policies (see list in dimension 2 above)	Subsystem/sector-level participants (see list in dimension 2 above)
|Dimension 4: Policy instruments			
Range of instruments at system level	What range of instruments is available at the	System-level policies (see list in dimension 1 above)	System-level participants (see list in dimension 1 above)

	system-level to shield forests from competing land uses?		
Range of subsystems/sectors equipped with policy instruments	What range of sectors has adopted policy instruments to address deforestation and related emissions?	Subsystem/sector-level policies (see list in dimension 2 above)	Subsystem/sector-level participants (see in list dimension 2 above)
Consistency of policy instruments	To what extent is the mix of policy instruments coherent?	-System-level policies (see list in dimension 1 above) -Subsystem/sector level policies (see list in dimension 2 above)	-System-level participants (see list in dimension 1 above) -Subsystem/sector-level participants (see list in dimension 2 above)
Implementation of policy instruments	What range of policy instruments is effectively implemented at both system and subsystem/sector levels	-System-level policies (see list in dimension 1 above) -Subsystem/sector-level policies (see list in dimension 2 above)	-System-level participants (see list in dimension 1 above) -Subsystem/sector-level participants (see list in dimension 2 above)

We employed NVivo (QSR 12) to analyse the policy documents and the interview transcripts (Bryman, 2012), and used the four EPI dimensions of policy frame, sector involvement, sectoral coordination, policy instruments and their respective subcomponents as our pre-determined categories for deductive coding (Patton, 2002). Coded text was then assessed against the varying degrees of manifestations of EPI dimensions ranging from low to higher levels of integration for each indicator (Tables 1 to 5). The following section outlines our findings.

5. Results

In what follows, we assess REDD+ policy integration into the four land use sectors and across the four EPI dimensions of policy frame, subsystem involvement, sectoral coordination, and policy instruments, dimension by dimension, each addressing our four research questions.

5.1. Framing of deforestation as an indicator of political backing for REDD+ integration

The framing of deforestation or the recognition of its multidisciplinary character in macropolitical venues at MINEPDED and MINFOF has been divisive. In the environmental department, there is a strong belief in the virtue of a multisectoral approach to tackling

deforestation evidenced in the environmental legislation that prescribes sectoral inclusion in tackling broader environmental problems, and in REDD+ respondent's advocacy for greater involvement of land use sectors in the REDD+ process.

> *"The Administration in charge of the environment shall ensure the inclusion of environmental concerns in all [...]plans and programmes."* ***1996 Environmental law, Article 14 (1)***
>
> "*REDD+ cannot be a matter of the environment department alone, but of all sectors involved in natural resource management. MINEPDED shall simply play a supervisory role."* ***REDD+ participant***

The opposite sentiment prevails in the forestry department. While the 2013 forest strategy acknowledges the shared responsibility of land use sectors in forest clearing, the perception that forest matters fit within MINFOF boundaries transpires in both the forestry legislation that assigns forest management responsibility to the forestry institution, and in MINFOF participant's claim that other stakeholders overstep their attributions.

> "*Forest management shall be the concern of the ministry in charge of forests working through a public body".* ***Article 64 (1), 1994 Forest Law***
>
> "*If there are forest-related activities to be carried out as part of REDD+, let the forestry department handle those; the problem is there is a group of people trying to take over MINFOF responsibilities, which is not good".* ***MINFOF Participant***

Overall, the growing awareness within the environmental sector of the cross-cutting nature of deforestation and the imperative of a holistic governance approach to addressing forest clearing matches the third stage of Candel and Briesbrook's EPI assessment index (Table 1). On the other hand, MINFOF's acknowledgment of land use sectors' shared responsibility for deforestation and their belief that forest matters are to be handled by the forestry institution fits the second stage of the EPI index, as outlined in Table 1. Thus, the level of central state actors' support for integrating REDD+ objective of curbing deforestation into land use sectors falls between stages 2 and 3. It appears that the momentum for cross-sectoral integration at system-level might be limited by MINFOF's loyalty to institutional compartmentalisation. REDD+ policy integration is also a function of land use sectors' commitment. Next, we assess the related dimension.

5.2. Subsystem/sector involvement

The second dimension of subsystem involvement captures both the framing of deforestation among land use sectors and their involvement in tackling forest clearing. Bar the public work department, there has been wide recognition of the multi-dimensional nature of forest clearing

across land use sectors. Surprisingly, the latter have been casually involved in the REDD+ process, and their policy goals seldom invoke deforestation, as indicated below.

5.2.1. Subsystems or sectors involved in addressing deforestation

The departments in charge of agriculture, livestock, public works and mining pledge to conform with natural resource and environmental protection broadly. Queried on their understanding and framing of the specific problem of deforestation, land use actors acknowledged its multi-sectoral character, save the respondent from the public work department who believes roadwork contributes only marginally to forest clearing.

> *"Deforestation contributes to climate change but not significantly; global warming is largely linked to industrialization. Most of the roads we build existed already and only needed widening and tarmacking. So, we do more of road maintenance which marginally impacts trees."* ***MINTP participant***

Land use respondents' recognition of the benefits of a cross-sectoral handling of deforestation has yet to drive participation in the REDD+ process. REDD+ actors report a rather casual engagement of subsystems in REDD+ meetings, possibly due to limited motivation and expertise in the subject.

> *"Sectoral participation in the REDD+ process is a challenge that might stem from a lack of enthusiasm or a limited mastery of the subject by sectoral departments. To this day, REDD+ comes across as an esoteric language reserved to experts[..] Land use sectors constantly alternate their representatives to REDD+ committee meetings and this hinders progress […]When introduced to REDD+, decision-makers usually query about how much it contributes to the GDP: I don't know if there is currently an answer to that? Hence the lack of enthusiasm."* ***REDD+ participant***

In summary, there is wide recognition of the crosscutting character of deforestation across sectors that contrasts with their limited involvement in tackling forest clearing. Stage three in the EPI grading index would be reached when such awareness translates into more sectors having formal responsibility for dealing with the problem (Table 2 – Row 1), while stage one reflects a lack of recognition of the transdisciplinary nature of the problem. Thus, our case matches stage two of the EPI grading index. The poor involvement of land use sectors in addressing deforestation could be linked to the absence of forest concerns in sectoral policy goals.

5.2.2. Subsystem/sector policy goals

The sub-dimension of policy goal assesses the explicit adoption of forest protection goals within sectoral policies. In our case, sectoral policy goals have hardly invoked forest

preservation, although they all commit to protecting natural resources and the environment. Varied justifications were provided, including their limited competence in forestry and belief that forest issues would be best handled within a broader environmental package rather than in isolation.

> "*In the livestock ministry, we do not have the confidence to discuss forest matters. Even if we include it in our policy, we will still have it transferred to the forestry department that has more competence in the subject.*" ***MINEPIA participant***
>
> *"I don't think singling out forest-related activities would be the best approach."* ***MINADER participant***

As suggested by MINADER respondent, sectors' policy goal of preserving natural resources might indeed encompass forest protection. For example, although MINADER's policy objectives merely mention natural resources, forest protection is visible in the breakdown of related activities.

> *"Activities in line with sustainable resource use include improving access to and use of agricultural land and natural resources [...]securing and conserving the permanent forest estate, wildlife and protected areas."* ***MINADER Policy***

While MINADER policy incorporates forest protection, related activities of securing and conserving the permanent forest estate appear to be clones of MINFOF attributions, corroborating MINEPIA respondent's claim that some forest activities included in land use sector policies would eventually be transferred to MINFOF. Meanwhile, carbon mitigating activities such as curbing slash and burn shifting farming practices are seldom addressed in MINADER policy. Forest matters are still viewed across land use sectors as MINFOF competence, matching stage one of the EPI grading index, where addressing a cross-cutting problem is only embedded within the goals of a dominant sector (Table 3 – Row 1). Such limited sectoral involvement could be indicative of latent challenges in coordinating diverging environmental and developmental goals as addressed next.

5.3. Sectoral coordination

Policy analyses have revealed strong political will for sectoral coordination in Cameroon that spawned dense interaction among ministerial departments at national-level. But this has yet to permeate the deconcentrated administration at ground-level where land use conflicts persist.

5.3.1. Density of interaction

Foundational and sectoral policies have created a conducive institutional environment for inter-ministerial cooperation, especially by clustering ministerial departments into functional groups. The 2009 national Growth and Employment Strategic Paper and its recent incarnation the 2020 National Development Strategy groups the four land use sectors of agriculture, livestock, environment, and forest departments into the rural sector cluster. All four departments have conjointly designed the 2005 Rural Development Strategy for a coordinated use of the rural space.

Sectoral interaction is further reinforced by joint platforms such as the Interministerial Committee for the Environment (ICE) composed of over 15 departments. ICE's stated aim is to ensure environmental considerations are taken into account in the design and implementation of economic, energy and land programs, and to provide advice on environmental impact studies. In the REDD+ context, the National REDD+ Steering Committee composed of different ministries facilitates sectoral involvement in the REDD+ process. These collaborative platforms have paved the way for a dense network of interaction among land use sectors.

> *"We interact mostly with our closest neighbour, MINEPIA. one would hardly dissociate animal husbandry from farming. MINFOF provides us with tree nurseries for agroforestry; Project would hardly be undertaken without prior environmental impact assessment overseen by MINEPDED; MINMIDT is resourceful for local industry development and intellectual property protection; Our relationship with MINTP is not very formal."* ***MINADER participant***

> *"For road construction, we interact with the land registration department on expropriations, with the agriculture and the housing departments on crops and property compensations, with the mining department on material supply. […] I do not have much knowledge about our involvement with the forestry department."* ***MINTP participant***

Thus, aside from the loose ties between MINFOF and MINTP, all the sectors directly concerned with the problem of deforestation interact with one another. Although the exception of MINTP suggests these interactions hardly reach the high-density level that characterises stage four (Table 2 – Row 2), they are considerably ahead of instances of infrequent exchange of information at stage two. Thus, the density of interaction in our case matches stage three of the EPI grading index. Yet, this still fails to secure coherence of sectoral goals.

5.3.2. Coherence of policy goals

EPI aims to address the incompatibilities between developmental policies underpinned by intensive resource exploitation and environmental policies pursuing opposite goals.

Inconsistencies are notable between REDD+ goal of achieving net-zero deforestation by 2035 and the development goals within the same timeframe, poised to drive land use conversion across sectors. In line with the national development vision, the 2014 and 2011 agricultural and livestock policies seek to enhance food production and productivity through modernisation and mechanisation of production infrastructures, with predictable implications for forest conversion.

> *"The strategy seeks to increase livestock and fishery production to meet nutritional needs and provide raw materials for agro-industries and export."* ***2011 livestock policy***

Similar unintended outcomes can be expected from MINMIDT policy goal of intensifying mining exploration and exploitation, and the rail development plan of the public work department to connect mining sites to seaports. Thus, unless steps are taken to attune economic development and environmental goals, policy coherence would not be attained and frictions would intensify.

> *"It may seem like everything works smoothly at the institutional level, but the difficulty lies in operationalising the collaboration. Most problems occur in the field, where everyone tries to pull the blanket on their side, stepping on each other attributions, leading to complaints on end."* **MINADER *participant***

Such low policy coherence clearly fits stage one of the EPI grading index (Table 3 – Row 2. The prevalence of land use conflicts despite strong sectoral interaction could signal defective integration instruments.

5.4. Policy instruments

In addition to inter-ministerial committees, the national REDD+ strategy has relied on a mix of regulatory and communicative instruments employed at both system and sectoral levels to nudge forest considerations into sectoral routines.

5.4.1. System-level policy instruments

At the system-level, regulatory instruments including forest zoning and environmental impact assessment have been instituted by the forestry and the environmental institutions respectively. Reputedly central to addressing forestland encroachment, forest zoning has been undermined

by legitimacy problems. Similarly, environmental impact assessment is mired in its application by loopholes and inconsistencies with sectoral regulations.

Forest zoning

The Cameroonian forestry legislation introduces a zoning plan setting aside 30% of the forest estate for exclusive and permanent forest use, to maintain a permanent stock of forest carbon and prevent encroachment by other land uses. The forestry legislation stresses that any area of the permanent forest estate (PFE) cleared under exceptional circumstances shall first be declassified then compensated with an area of equivalent extent and ecological characteristics. It further emphasises fire control and prohibits late fires lit in the height of the dry season.
Although land demarcation in forest zoning could ward off forest encroachment, it has only covered the southern half of the country and remains incomplete to this day. Further, the ministry in charge of forests that initiated the zoning process is hardly responsible for land allocation. As acknowledged in the 2013 forestry strategy, this has posed legitimacy problems. Land zoning is a prerogative of the ministry in charge of land planning, the institution that has yet to consolidate or release a national zoning plan to date. Until then, forest zoning falls short of shielding the PFE from encroachment by other land uses, especially extractive activities that are not prohibited across the whole PFE. The 2016 mining code bans extractive operations within protected areas only (article 126), which amount to only 25% of the PFE.

> *"The mining code states that there are areas where mining should not be carried out, such as national parks; but it does not prevent mining in the rest of the forest. The mining code was not designed solely by the mining sector, the forestry and environmental departments were also involved, then the President signed it."* ***MINMIDT participant***

In other words, the incompleteness and legitimacy uncertainties around the Cameroonian forest zoning, compounded by inconsistencies with mining regulations lie at the root of overlapping mining and forest titles. Below we examine the extent to which environmental impact assessment prevent forest clearing by competing land uses.

Environmental Impacts Assessment (EIA)

EIA is required in development projects to screen, anticipate and correct any detrimental impacts on the environment, thereby compelling land use sectors to mitigate deforestation. However, the leading drivers of deforestation have fallen through the cracks of the categories

of operations subject to EIA, and prohibitive administrative costs alongside inconsistencies with sectoral practices are poised to deter compliance.

The 2013 Decree on EIA introduces three forms of environmental assessments for three scales of activities: the environmental impact notice for small scale projects; the environmental (and social) impact assessment for large scale operations; and the strategic environmental impact assessment for policies, plans and programmes. While agriculture, livestock husbandry, public infrastructure and mining driving deforestation are covered across all three categories, traditional small-scale shifting agricultural activities identified as major deforestation drivers in Cameroon are omitted, as well as traditional pastoral activities associated with wildfires. While mineral exploitation is covered, mining exploration that could be as ecologically harmful is absent. It is thus evident that EIA would only partially prevent deforestation and perhaps even just marginally considering prohibitive administrative costs.

The 2013 EIA Decree mandates project developers to submit the terms of reference of their EIA for review by the Interministerial Committee on the Environment (ICE) that charges examination fees of CFA F 1500000 to 5000000 ($2 400 to $8 063). Such costs on top of the cost of conducting the assessment and addressing environmental impacts may disincentivise compliance in low-income settings.

To conclude, both the forestry and the environment institutions at system-level have regulatory instruments to incorporate forest concerns into land use practices. While these few instruments would hardly be considered as the broad range of instruments that typify stage four (Table 4 – row 1), they are more substantial than the information sharing tools that characterise stage 2 and closely match stage three featuring an increasing number of system-level instruments. However, forest zoning lacking legitimacy, EIA loopholes and prohibitive administrative costs hinder their capacity to address deforestation.

5.4.2. Subsystem or sector level policy instruments

Regulatory instruments designed at system-level have been introduced at sectoral level to address land use conflicts, environmental degradation as well as deforestation. Although EIA is gradually adopted across land use departments, its ability to restore degraded lands has been questioned.

> *"EIAs are conducted prior to any road projects by independent agencies, and mitigation measures follow, including the creation of green spaces or wells for residents; so, there is a lot done to mitigate projects' impacts, although we cannot exactly replace what has been destroyed."* ***MINTP respondent***

In addition to enforcing EIA, the livestock sector envisions mapping out pastoral areas to secure agro-pastoral resources and land. Like forest zoning, pastoral mapping would help avoid land use conflicts and minimise forestland encroachment; but it may also lack legitimacy unless led by the department in charge of land planning. Communicative instruments such as awareness-raising campaigns have also been organised to sensitise pastoralists about wildfire control.

In summary, a mix of regulatory and communicative instruments such as EIA, land demarcation, and sensitisation campaigns have been used across sectors to prevent forest clearing, matching the diversification of instruments across subsystems at stage 3 of the EPI grading index (Table 4 - Row 2). While the instruments are of varying effectiveness, this subdimension is overrated by Candel and Biesbroek's framework that does not take into account instrument effectiveness. Their capacity to foster integration also hinges on their implementation.

5.4.3. Instrument implementation

The fourth EPI dimension of policy instrument focuses on the range of instruments in place at system and sector levels, while integration occurs when these are implemented. Hence our addition of the supplementary sub-dimension of instrument implementation, the application of which has exposed inadequate monitoring of existing integration tools due to legislative inconsistencies. Since implementing forest zoning would be impaired by lack of legitimacy, we focus here on the implementation of EIA and awareness-raising initiatives.

The environmental legislation designates MINEPDED to oversee the design of EIA studies, but delegates relevant sectors to monitor implementation and compliance, ie MINADER in the case of farming projects and MINTP for infrastructure construction. However, land use sector representatives unanimously claim that monitoring EIA implementation fits the duty of the environmental department that possesses the requisite environmental expertise.

Monitoring has also proven lax with the communicative tools in the livestock department. MINEPIA respondent reported inadequate follow-up of awareness-raising campaigns on dangerous bushfires, raising doubts about whether the guidelines have been adhered to.

The inadequate monitoring of policy integration instruments suggests that not much has been done beyond their design which might explain a respondent's observation that impunity

hampers rule adherence. Thus, the subdimension of instrument implementation fits stage one of the EPI assessment index, where implementation deficit prevails (Table 5).

5.4.4. Consistency of policy instruments

While awareness raising or communicational instruments and regulatory tools are mutually reinforcing, the evidence above indicates incoherencies between forest zoning and mining regulations regarding mining activities in the PFE, and between the environmental legislation and land use sectors about responsibilities for EIA monitoring. Although mutually reinforcing instruments suggest a step ahead of stage one that features no consistency of instruments (Table 4 – Row 3), there is seldom a perceptible attempt among sectors to address the identified incoherencies as would be the case at stage 2. Thus, this subdimension is transitory between stages one and two.

Figure 2 illustrates our overall assessment of the extent to which REDD+ objective of forest protection is integrated into land use sectors in Cameroon, across all four EPI dimensions.

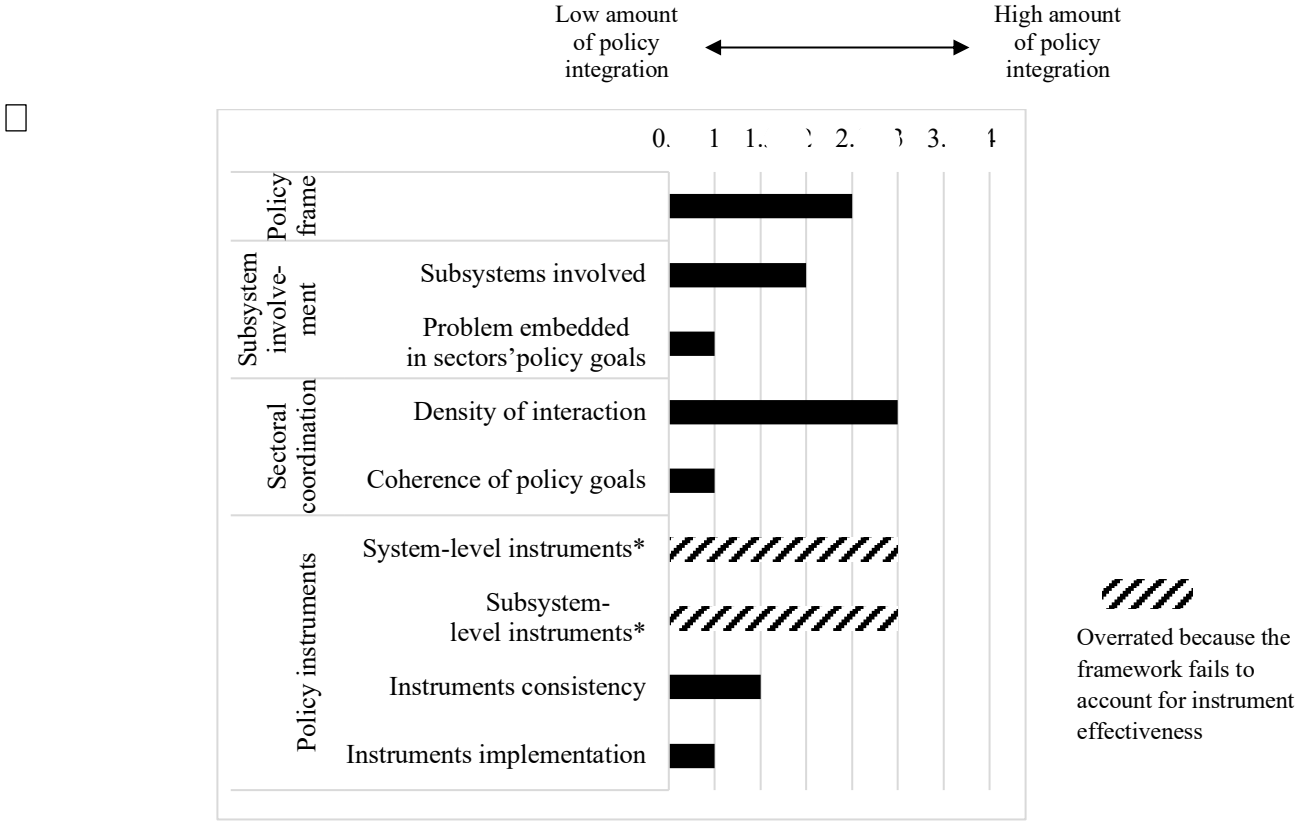

Figure 2: Integration level of REDD+ aim of forest protection in competing land use sectors

Our assessment revealed polarised framing of deforestation at system level, moderate to low degree of subsystem or sector involvement and sectoral coordination, and impaired policy instruments. Improvement of policy integration instruments would support cross-sectoral coherence and changing stakeholders' framing of deforestation would improve their involvement in the REDD+ policy process.

6. Discussion

6.1. Framing of deforestation and support for REDD+ integration

The framing of deforestation at the macro-governance level has been polarised, involving a strong belief in the interdisciplinary nature of forest clearing among environmental actors, and the perception in forestry circles that forest matters fall within the boundaries of the forestry institutions. Undoubtedly, the forestry department is best equipped to handle forest matters as pointed out by other foresters in the tropics (Mulyani & Jepson, 2013; Atela et al., 2016). The advocacy for an intersectoral approach to tackle deforestation by the environment department, an interdisciplinary institution, is unsurprising, but their backing for REDD+ integration might yield only little in driving the integration of REDD+ objective of forest protection into land use sectors if MINFOF, the gatekeeper of forestlands claims unilateral responsibility over forest matters.

The apparent territoriality of the forestry administration over forest-related responsibilities which translates into limited backing for sectoral REDD+ integration could be further explained by the overall paradigm shift in environmental governance. Growing dissatisfaction with regulatory policies has prompted a shift toward the adoption of New Environmental Policy Instruments (NEPIs) such as REDD+ (Jordan et al., 2003). As is the case, state-controlled regulations that are hardly ever fully enforced have proven inadequate to internalise or take account of the externalities or the ecological impacts of economic sectors (Jordan et al., 2003). Yet, as evidenced with the FLEGT process in Cameroon, introducing NEPIs entails that the central government loses its steering ability as control is displaced sideways to the civil society, upwards to international organisations, and downwards to local communities (Pierre & Peters, 2000). As a result, NEPIs adoption has usually been met with opposition from vested interests in traditional regulations (Hanley et al., 1990). Hence reluctance in the forestry administration to the transfer of forest responsibilities to other entities.

6.2. Subsystem or sector involvement in reducing forest clearing

Our findings reveal wide recognition of the crosscutting character of deforestation across sectors, contrasting with their limited involvement in tackling forest clearing. Land use sector representatives show little confidence in their technical understanding of forest activities, hence the absence of forest considerations from sectoral policy goals and their disengagement from REDD+. The deficit of expertise to weave environmental objectives into sectoral routine is a common barrier to EPI (Persson, 2004), and is compounded in our case by the misconceptions about stakeholders' roles in the REDD+ process. Land use actors question their skills in forestry and yet would seldom be expected to assume a forest management role or duplicate the forestry department. Instead, they are required to design preventive and corrective measures to minimise their forest footprint, such as ecologically fit farming practices. Land use sectors' misunderstanding of their role and forest actor concerns that their attributions are overstepped indicates ambiguity around stakeholders' roles in REDD+ development that has proved obstructive to sectoral integration and is not specific to Cameroon. Similar imprecisions have been stark in Kenya (Atela et al., 2016), Vietnam (Mcnally & Nguyen, 2016), and Peru (Robiglio et al., 2014). Thus, informing stakeholders on their roles would alleviate conflicts of interest, level up land use stakeholders and facilitate their adoption of REDD+ objective.

Casual attendance of poorly motivated representatives of land use sector in REDD+ meetings could also explain unawareness of role distribution. Sectoral actors tailoring their involvement in REDD+ to its contribution to the GDP provides evidence that REDD+ integration both seeks to address and is challenged by competing policy priorities (Nunan et al., 2012). Financial incentives are thus vital to integrate forest protection into development sectors. However, uncertainties regarding the amount and timing of carbon payments still fails to ignite stakeholders' interest across REDD+ implementing countries (Mulyani & Jepson, 2013; Awono et al., 2014).

6.3. Sectoral coordination

Our assessment has revealed strong sectoral interaction, at odds with prevailing sectoral incoherence and land use encroachment. The dense interaction among land use sectors credited to the strong political will for sectoral coordination in Cameroon could be an important asset for REDD+ policy integration. The loosest sectoral ties between the public work department (MINTP) and MINFOF explains the poor awareness or denial by the MINTP respondent of the department's forest footprint. The respondent argued that road construction has consisted of

road maintenance and caused only marginal forest disturbance. Budget constraints have impeded road network extension (Dominguez-Torres & Foster, 2011; MINEPAT, 2012), but booming demography and growth of road traffic will change this. MINTP is also responsible for infrastructure development such as Kribi seaport, which has a proven record of driving deforestation (Ngueguim et al., 2017). Inadequate awareness of such impacts within the sector that has little connection with MINFOF highlights the importance of interaction density.

Despite strong sectoral interaction overall, conflicts and overlapping land uses prevail as reported in other REDD+ countries (Fujisaki et al., 2016; Weatherley-Singh & Gupta, 2017). In the absence of functional integration instruments as will be discussed next, political support for cross-sector coordination would avoid conflict at the national level, but merely move it downstream to the implementation level (Nunan et al., 2012).

6.4. Policy instruments

Previous studies have heralded forest zoning as a robust foundation for REDD+ and a remedy to conflicting land allocations (Topa et al., 2009). Yet, it is failing to halt deforestation in Cameroon. The Cameroonian forest zoning has only covered the forested South, and not the Sahelian North where pastoral activities involving fire undermine reforestation efforts (Shidiki & Unusa, 2020). Further, lack of legitimacy of forest zoning initiated by the forestry administration devoid of land allocation attributions has enfeebled its ability to shield the permanent forest estate, hence recurrent land use conflict and overlapping mining and forest titles (Kengoum & Tiani, 2013). This highlights that the land use conflicts undermining REDD+ policy integration have some of their roots at much higher than sector level. The 1994 forest law that bans clearing in the PFE and the 2016 mining law that allows mining activities in 75% of the PFE were both approved by the same high-level institutions that promote sectoral coordination. It is thus hardly surprising that land use encroachment prevails despite dense sectoral interaction.

The effectiveness of EIA has been compromised by loopholes, prohibitive administrative costs and implementation deficit. Concerns about the loopholes in the EIA regulation were flagged early on (Alemagi et al., 2007). In the agricultural sector where deforestation is smallholder driven, EIA has focused on large scale agriculture. Still, outcries over widespread deforestation by environmentally certified large scale plantations such as the 80,000 ha Herakle palm oil farm in Southwest Cameroon (Hoyle & Levang, 2012) raise doubts about the effectiveness of EIA in integrating forest protection in the agricultural sector and development projects. Further,

one might question whether the protection or classification status of cleared forests is addressed in EIA; while several protected areas emerged in compensation for the impacts on wildlife of some large-scale infrastructure projects such as the Chad-Cameroon oil pipeline and Lom-Pangar hydroelectric dam, whether the entirety of forest cleared has been restored is uncertain. EIA of the Kribi deep seaport (Ngueguim et al., 2017) hardly states whether any portions of the 26 000 ha of forest cleared pertains to the PFE or encroach on forest management units visible in the project map (WRI, 2013), and whether a declassification and reclassification process has been undertaken in conformity with the 1994 forest law to preserve the forest estate and associated carbon stocks. This highlights the need to integrate spatial zoning and EIA to mutually reinforce their ability to integrate REDD+ and forest protection in sectoral projects (Hapuarachchi et al., 2016; Byambaa & de Vries, 2020).

Our results also align with Rutasitara et al. (2010)'s findings that limited resources constrain the potential for environmental integration, and corroborate Alemagi et al. (2007) and Minang et al. (2019) warnings that EIA administrative fees of up to £6000 disincentivise compliance. The fees intended to support member attendance in ICE (committee) meetings suggest that dense sectoral interaction is not costless, resonating with Korhonen-Kurki et al. (2016) report of collapsing inter-ministerial REDD+ platforms due to high operating costs. Organisational or regulatory instruments require generous use of resources, thus complementing integration instruments with an economic tool that offset such expenses is central (Panayotou, 1994; Runhaar, 2016; Barton et al., 2017). Transaction costs in REDD+ payment (Merger et al., 2012; Rakatama et al., 2017) could thus cover such expenses to secure integration, in addition to opportunity costs offsetting the forgone benefits of competing land uses. REDD+ can thus be seen as an economic incentive instrument facilitating forest integration in a broader land use context. However, whether REDD+ opportunity costs outweigh opportunity costs from other land uses is uncertain (Angelsen, 2012; Liu et al., 2020) and would demand monetisation of carbon and its deduction from the net revenue of land uses associated with forest emissions (Cosslett, 2013). In other words, the existing mix of regulatory, communication, organisational and economic integration instruments would be strengthened by an additional economic disincentive instrument such as carbon taxation that internalises forest carbon costs in development projects.

We have shown that the mere existence of policy instruments seldom guarantee REDD+ policy integration, and that EPI analytical frameworks should consider not just the range of designed and adopted policy tools, but their implementation too. Our addition of the fourth sub-

dimension of instrument implementation highlighted inadequate monitoring of compliance. EIA, in particular, would be best overseen jointly by the environment department and relevant sectoral institutions.

The contribution of our study is multifold in practical, academic, and theoretical terms. We have conducted a wholistic assessment of REDD+ policy integration into land use sectors driving deforestation in Cameroon, offering policy recommendation to improve REDD+ integration and by extension its implementation outcomes in Cameroon.

Existing academic research on REDD+ policy integration has focused on sectoral coordination. We enrich it by considering other EPI components including stakeholders' framing of deforestation, a key indicator of political support for integration, and policy instruments. Our probing of instruments such as forest zoning and environmental assessment adds nuance to studies that consider land use zoning as a remedy to conflictive land allocation (Pettenella & Brotto, 2012; Robiglio et al., 2014). Our processual take on REDD+ integration is also innovative. Unlike existing analyses that take integration as an output and merely establish whether REDD+ is or not integrated into land use sectors, we assess the extent to which it is, thereby providing a more nuanced picture of the scope and nature of efforts needed to achieve and possibly maintain a desired level of integration in a given setting.

Finally, we contribute an amended framework to EPI analyses. Although Candel and Biesbroek (2016) framework enables holistic examination of EPI and provides a processual analytical tool and clear assessment criteria, it omits important aspects of policy integration which we have addressed.

7. Conclusion

We have adapted and applied an innovative EPI conceptual framework to assess the extent to which the REDD+ policy objective of reducing deforestation and associated emissions is integrated across the sectors of agriculture, livestock, infrastructure, and mining in Cameroon. Drawing from policy documents and decision-makers' interviews, our analysis revealed varying levels of integration across EPI components. The polarised framing of deforestation fuelled by concerns about conflicts of interest around forest management as well as land users' insecurities about their ability to handle forest matters explains the limited political backing that has delayed REDD+ policy integration. Further, motivation deficit compounded by the absence of specific forest protection mandates in sectoral policy goals failed to translate land users' awareness of the centrality of a cross-sectoral approach to addressing deforestation into

active involvement in the REDD+ process. We also found that the strong political will for cross-sectoral coordination in Cameroon has been compromised by inconsistencies in land use regulations and defective integration instruments that entertain forestland encroachment. We argue that better informing land use stakeholders on their roles in the REDD+ process and clarifying carbon payment arrangements would facilitate and motivate sectoral involvement in REDD+ deployment. Land use conflicts and the ensuing retreat of forestlands could be addressed by legitimising and completing the forest zoning, while alleviating land use inconsistencies and amending loopholes in environmental assessment regulations. Such reforms would advance REDD+ policy integration if the instrument mix is effectively enforced and includes a financial disincentive internalising carbon costs into projects detrimental to forests. Further studies are needed on such instruments, as well as on organisational structures conducive to an enhanced REDD+ policy integration into development sectors.

Data availability statement

The datasets generated and analysed during the current study include legislations, policies, reports, and interviews.

-All legal and policy documents as well as government reports are publicly available and can be provided by the corresponding author upon request.

-Interview data are not publicly available; disclosing them risks breaching participants confidentiality.

Conflict of interest

We have no known competing interests that could have appeared to influence the work reported in this paper.

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