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Spiders in the Web: Understanding the Evolution of REDD+ in Southwest Ghana

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Abstract: The implementation of the global programme on Reducing Emissions from Deforestation and Forest Degradation in developing countries, and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks (REDD+) is lacks a robust financial mechanism and is widely criticized for producing too little positive impact for climate, nature, and people. In many countries with tropical forests however, a variety of REDD+ projects continue to develop on the ground. This paper fills in some of the gaps in our understanding of the dynamic relation between global policymaking and implementation of REDD+ on the ground. Using the introduction of REDD+ in Southwest Ghana as an example, we apply a practice-based approach to analyze the different roles that local actors and global-local intermediaries played in the introduction of REDD+. Our results show a more balanced picture than polarized debates at the global levels suggest. The logic of practice explains how REDD+ was translated to the local situation. Global actors took a lead but depended on local actors to make REDD+ work. Together, they integrated elements of existing practices that helped REDD+ 'land' locally but also transformed REDD+ globally to resemble such local practices. REDD+ initiatives absorbed elements from established community-based conservation, forest restoration, and sustainable agro-forestry practices. The evolution of REDD+ in Ghana reflects global trends to integrate REDD+ with landscape approaches.

Keywords: REDD+; practice-based approach; global-local nexus; forest and climate policy; Ghana

1. Introduction

Over the last decade, Reducing Emissions from Deforestation and Forest Degradation in developing countries, and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks (REDD+) emerged as an international effort to fight tropical deforestation and to mobilize finance for reducing CO_2 emissions based on avoided deforestation and forest degradation. It developed from a daring proposal in 2005 at the 11th Conference of Parties (COP) at the United Nations Framework Convention on Climate Change (UNFCCC) to a key component of the 2015 Paris Agreement. The 2013 Warsaw Framework was particularly important because it provided guidelines on monitoring through remote sensing and ground-based observations. Subsequently, the Paris agreement created the basis for REDD+ countries to attract investments from donor nations and private sector actors through zero-deforestation policies and carbon markets linked to the national climate action plans or Intended Nationally Determined Contributions (INDC) of REDD+ countries [1–5].

REDD+ developed because it was seen to be a legitimate climate mitigation option that involved developing countries in climate mitigation with promises to benefit local communities and biodiversity conservation [6]. Over time, the introduction of REDD+ has resulted in a plethora of REDD+ initiatives.

REDD+ has a strong market share in the voluntary carbon space and bilateral and multilateral programs have pledged billions of USD to REDD+ preparations including 100 million to Ghana [7]. Given this flexibility, REDD+ is considered to take place in a 'global-local nexus' of forest governance [8]. The global-local nexus combines the qualities of multi-level governance—that highlights how policies are connected across global, national, and local levels—with an emphasis on how networks of actors shape policy more horizontally as well [9,10].

The global-local nexus has not received much academic attention yet in forest policy. Selected studies do study how global, national, and local levels together affect forest policy [9–11]. These studies highlight the specific interactions that occur between different levels of governance. In the case of REDD+, such studies often include calls for better inclusion of local actors and coordination across levels [10,11], amongst others. Other studies limit themselves to the interactions between global and domestic levels of governance more specifically [12–14], mostly focusing on the effectiveness of international efforts—including REDD+—to influence forest policies on the ground. However, studies that focus both explicitly on the global-local nexus and on how actors actively move from one level to another are hard to find. The few studies that do so emphasize that interactions amongst governance actors produce specific practices that are highly sensitive to social-ecological context [15–17].

Critics REDD+ argue that projects fail to be sensitive to both global aspirations and local needs. First, the demand for REDD+ projects that produce emission reductions is relatively small. Reasons include the slump in global carbon prices due to the post-2008 economic slowdown and the failure of the Parties to the UNFCCC to agree on a financial architecture for REDD+. Second, REDD+ is viewed by some as a false solution that deflects attention from the need for companies and governments in the industrial world to take a lead in decarbonizing the economy and places too much responsibility on local communities. Third, the inclusiveness and effectiveness of REDD+ on the ground is challenged by critics that fear for the exploitation and further marginalization of local communities in light of inadequate legal frameworks and a lack of transparency and rule of law [18–23]. Finally, Fletcher et al. [24] argue that conservation markets cannot compete with extractive markets and will always need additional support in terms of subsidies and regulation.

Responding to critiques of REDD+, Angelsen et al. and others [18,25] argue that REDD+ serves as a discursive resource that is constantly reproduced—and altered—in practice. Indeed, Turnhout et al. [26] highlight that REDD+ over time has moved from being a carbon-centered, market-based instrument, to include broader climate mitigation and nature conservation strategies that focus on co-benefits and landscape approaches. Den Besten et al. [27] illustrated that this 'evolution' of REDD+ takes place in the global-local nexus where actors and ideas travel across levels: the capacity building and learning activities of local REDD+ piloting and testing informed REDD+ policy development at the global level. This contributed to the prioritization of inclusive and extensive REDD+ preparations and governance development, ahead of possible future carbon finance mechanisms [6,28].

Ghana is a prominent REDD+ country that has witnessed one of the highest deforestation rates in the world [29]. In 2010, 21.7% of land or 4,940,000 hectares was covered by forest [29]. Deforestation is a critical environmental and economic issue and Ghana. Since 1990, the country has lost more than 33.7% of its forests [29], costing the forest sector an estimated USD $500 million [30]. Subsequently, Ghana received a lot of attention from REDD+ donors and programs. At the same time, it is a country where challenges regarding land rights and inclusive governance by some were seen to complicate the implementation of REDD+ [31]. Despite pledges and commitments from REDD+ donors, relatively little of these funds are shown to reach actors at the lower levels of governance [7]. Early REDD+ actions in Ghana have nevertheless contributed to a strong REDD+ commitment as part of the country's INDC in the context of the Paris agreement [32].

In this article, we show that both global-local intermediaries and local actors have played a key role in the evolving meaning and practice of REDD+ in Ghana, often with limited funding on the ground and in areas where the challenges in terms of land and tenure rights were great. To better

understand how the global idea of REDD+ was increasingly shaped by local REDD+ initiatives and practices, this article focuses on the process of REDD+ introduction in Southwest (SW) Ghana between 2007 and 2017. We apply a practice-based approach [15,33] to analyze how actors across governance scales shape the meaning of REDD+ and how key elements of REDD+ were introduced in practice.

2. Materials and Methods

When analyzing global forest policy, many studies have generated useful insights into the roles that global actors—including governments, non-governmental organizations (NGOs), development agencies, and companies—play on higher levels of governance [6,33–36]. These studies discuss how actors may form new and sometimes unexpected alliances in diplomatic processes [37] and subsequently form coalitions that support new forest discourses, including REDD+. At the same time, these studies often fail to explain how local community members exactly respond to new ideas, policies, and programs in their daily activities and how they relate to the actors designing these policies and programs and how individual actors can operate at multiple governance levels.

To flesh out how local levels of forest governance contribute to global policy development, we need to better understand how the agency of actors is shaped in these contexts [15]. Practice-based approaches explore how actors shape their ideas, identities and behaviors in the context of social practices. In particular, they emphasize that reality—and thus also change—emerges from our practical engagement with it [15]. Practices can be broadly defined as routinized behaviors where meaning and action are entwined [33,38]. Actors are situated in these practices. Their ideas, identities, and behavior are shaped as they reproduce the practice of which they are part [39,40]. Practices are therefore not only just 'entities' but also 'performances' [15,33] of which actors are an active part: as they perform practices, they simultaneously change practices over time.

Practices are not restricted to a single place. They emerge in one place and can travel over time and space, including across a global-local nexus. To understand this mobility of practice, Shove et al. [33] identify three key elements that make up a practice: meaning, competences, and materiality. Meaning includes images and ideas that form the emotional, motivational and normative components of practice. Competences include technical knowledge, know-how and skills that people have or need to perform the practice. Materiality includes physical and technological attributes that are part of society, such as machines, cooking stoves, utensils [33]. These elements are thought to give unity to a practice: when their links are strengthened, the practice persists and when their links are broken the practice dies out. Change can mean that the link between two elements (e.g., meaning and competence) persists while the link with a third element (e.g., materiality) is broken. For our analysis, we use the operationalization of the conceptual framework of Shove et al. [33] by Arts et al. [41]. They interpret meaning as ideas and discourses; competences as standards and procedures; and materiality as technologies and resources.

When practices arrive in a certain place, people unpack them and have the agency to fit them to the local situation [33]. When actors do so, they can change elements and combine them in new ways with the elements of other practices. This ability of actors to change practices within specific situations is called 'situated agency' [40]. It means that actors have the freedom to change practices, not so much because they are autonomous agents, but more so because they are part of the practices that they find themselves in [40]. Accordingly, they have a certain freedom and agency to improvise on existing practices. This improvisation is often done by recombining existing elements of practice, also known as institutional 'bricolage': "a process through which people, consciously and un-consciously, assemble or reshape institutional arrangements, drawing on whatever materials and resources are available, regardless of their original purpose" ([42], p4).

We apply the practice-based approach [33,40] and the idea of 'bricolage' [42] to the case of the introduction of REDD+ in SW Ghana. Doing so, we explore how REDD+ 'traveled' to this area as a set of elements of practice. The practice-based approach makes it possible to analyze how actors received, interpreted, and adjusted REDD+ in SW Ghana to their local practice. By dissecting REDD+ into

the materiality, competencies and meaning as elements, it was possible to assess how these elements combined with elements of other, existing practices as part of the local uptake of REDD+. The actors reconfigured elements via their situated agency in existing practices in the unpacking, influencing, and re-aligning of the elements of REDD+. We focused in particular on how groups of actors sought to introduce new elements of practice in existing routines and practices of forest management and community-based conservation.

We collected data on the introduction of REDD+ in the cocoa growing landscape in the High Forest Zone in SW Ghana from 2009 to 2016. (see Figure 1). Ghana has both seen high rates of deforestation [29] and the development of a variety of REDD+ initiatives. Between 2009 and 2016, the first author helped organize several dialogues, multi-stakeholder consultations and knowledge sharing initiatives while working for the International Union for Conservation of Nature National (IUCN) and the IUCN National Committee in the Netherlands (IUCN-NL). This provided context and contacts with various actors with different views and interests in the introduction of REDD+ in Ghana. It also enabled us to observe interactions of actors with different roles, expertise and expectations with regard to the effectiveness and fairness REDD+. The 'web of actors' are described below following the observations of the first author as one of these actors (representing IUCN). A non-authoritative graphic representation is given in Figure 2.
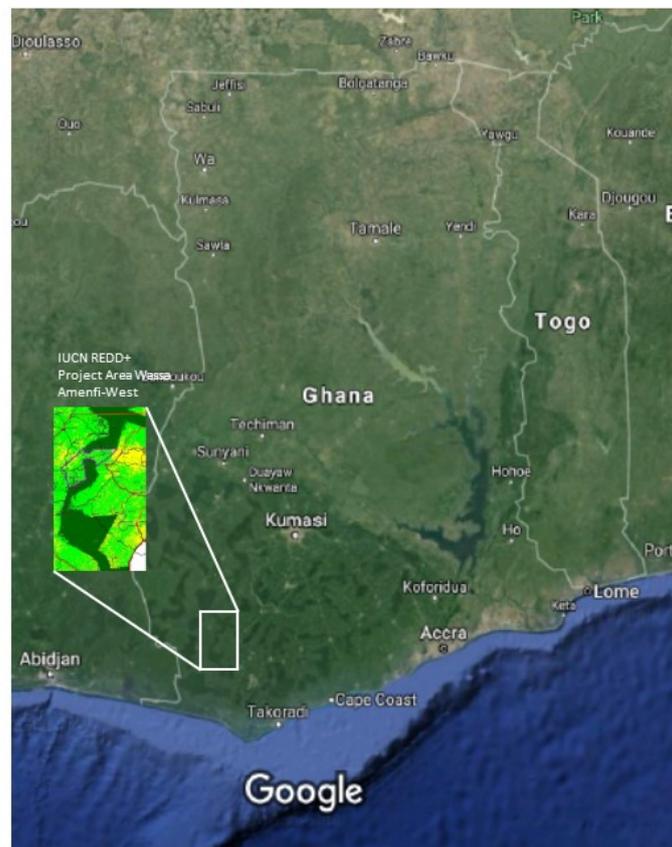

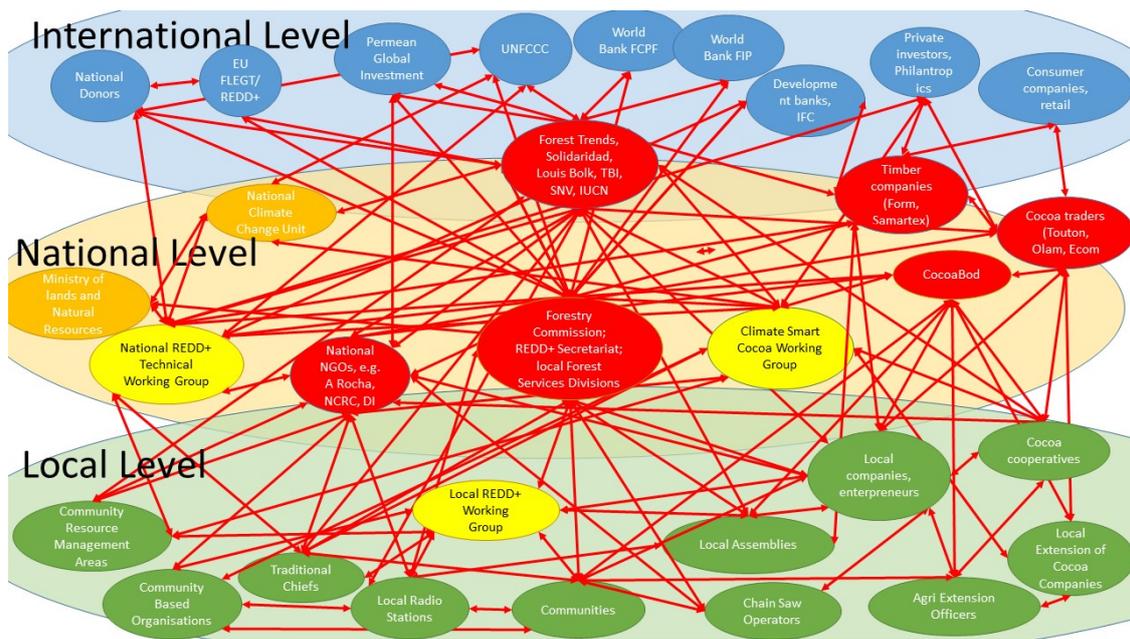**Figure 1.** Map with main research area in SW Ghana highlighted.

Figure 2. Graphic representation of the relations between various actors of the web of actors of Reducing Emissions from Deforestation and Forest Degradation in developing countries, and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks' (REDD+) implementation of SW Ghana as observed by the first author. Actors are color-coded as follows: Red = spiders in the web; Yellow = REDD+ implementation working groups; Blue = global actor; Orange =-national actor; Green = local actor.

To understand the role of global-local intermediaries in Ghana, it was important for the authors to interact with actors working on REDD+ implementation at the national level. In Ghana, the Forestry Commission (FC) of the Ministry of Lands and Natural Resources (MLNR) functions as the focal point for REDD+. The Climate Change Unit functions as the secretariat of the multi-stakeholder REDD + Technical Working Group (NRTWG) that coordinates Ghana's overall REDD+ development process. Government, private sector, civil society and other organizations are represented in this group. The NRTWG gives advice and guidance on all REDD+ processes (FCPF, 2012). Parts of REDD+ are driven by the Natural Resources Advisory Council (ENRAC), the Natural Resources and Environmental Governance Technical Coordination Committee (NREG TCC) that is responsible for the Forest Investment Program and the coordination of the Forest Carbon Partnership Facility (FCPF). Actors in Ghana working with these institutions at the national level, as well as inter-governmental development organizations, conservation and more critical NGOs were interviewed as part of this research. These actors were directly involved in both the international REDD+ engagements and discussions, and the translation of these concepts to the local situation in Ghana. These actors were operating at the global-local nexus, but not in isolation. They worked directly or indirectly with actors at the local levels. Men and women were for example involved in the translation, interpretation and implementation of REDD+ at the local level in the Wassa-Amenfi-West District (WAW). As a case study, we interviewed such actors in WAW and asked them how they viewed, interacted and worked with national and international actors. Locally, members of local settler communities, the District Assembly, traditional authorities, the Forestry Services Division of the Forestry Commission, members of the Community Resource Management Areas (CREMA), companies, local entrepreneurs, representatives of youth and women groups and members of the local multi-stakeholder REDD+ working group were interviewed.

Data collection consisted of three stages. A total of 35 Interviews took place. First, 20 interviews were conducted with local residents of three villages in the WAW where stakeholder consultations on

REDD+ had taken place. These interviews included several group interviews with local smallholder farmers with informal land tenure arrangements. Most of them had been exposed to REDD+ information and awareness raising activities. A few interviewees were local chiefs and two farmers owned larger plots of land. In addition to group and individual interviews in the villages, group interviews were also conducted with one of the CREMAs in WAW and the REDD+ multi-stakeholder platform in the District. The District head and a professional working for the District Assembly were also interviewed. The villages had in the past been involved with various community-based conservation initiatives, such as when Globally Significant Biodiversity Areas were identified. In these initiatives, as well as during the introduction of REDD+, the Forest Services Department of the Forestry Commission of the Government of Ghana played an important liaising role between global NGOs, local communities, and the District Assembly. Second, 15 interviews and various additional informal conversations took place with NGOs, government agencies, and companies that were involved in the introduction or awareness raising REDD+ in SW Ghana. Third, various REDD+ preparatory meetings, dialogues and discussions were observed, and meeting reports studied.

Transcripts of interviews and collected documents and field notes were first coded for categories such as prevailing ideas about forest dependency; indications of actors that presented information and concerns of local actors at the national and global levels; indications of practices and activities that helped local actors in socio-economic development and indications of uptake or change of elements of REDD+ introduced. In a second round of coding, data was analyzed for the three elements of practice, i.e., meaning, competences, and materiality. These initial rounds were then followed by several iterations to structure the results as they are presented below.

3. Results

3.1. The Introduction of REDD+ Practice in SW Ghana

3.1.1. Meaning: Ideas and Discourse

The global meaning of REDD+ is underpinned by the idea that deforestation is a major contributor to climate change because of the CO_2 emissions it causes. Governments, NGOs, Inter-Governmental Organizations (IGOs), companies, and research organizations that helped develop REDD+ at the global level believed that that it was imperative that tropical forests should be protected for climate but also for the biodiversity they harbored and for the local livelihoods they supported [4,5,27]. These ideas are supported by global discourses that assume that addressing deforestation will be an effective, fast, and financially efficient way to help global CO_2 emissions to peak and subsequently fall [43,44].

In Ghana, organizations that were involved in early REDD+ introductory activities included the Nature Conservation Research Center (NCRC), Forest Trends, Rainforest Alliance, Katoomba Group, Conservation Alliance, SNV, Tropenbos Ghana, University of Ghana, World Bank Ghana, Price Waterhouse Coopers (PWC), Permean Global, the Rockefeller Foundation, and Form International. Government agencies such as the Ghana Forestry Commission (FC) that hosted the National REDD+ Secretariat and led the development of Ghana's National REDD+ Strategy played an important role [38,45]. These actors had in common that they worked across the local and global levels of REDD+ development. In particular the non-governmental actors were active in introducing the idea of REDD+ in SW Ghana. Where introductions took place, these organizations generally focused on people and organizations in locations where they were already involved in community-based conservation and sustainable agro-forestry practices.

3.1.2. Materiality: Technology and Resources

Globally, the introduction of REDD+ was closely connected to the emergence and development of remote sensing equipment to monitor forest cover change in ever-greater detail, and information technology (IT) to quantify these changes in terms of loss of carbon to the atmosphere. The emergence

of carbon markets after the Kyoto Protocol that went into effect in 2005 made it possible to credit reduced deforestation and sell the emission reduction permits. Advances in development of use of increasingly complex computer programs also made the presentation of data in maps possible. These made up the materiality of REDD+. The maps of forest cover change and fluxes in carbon stocks became powerful tools to promote the idea and meaning behind REDD+. The combining of these elements clearly strengthened the unity of REDD+ as a practice.

In Ghana, like in many countries, access to forest resources has been unequally distributed. This instilled widespread concern about the access to REDD+ benefits for different groups. REDD+ benefit sharing therefore became a key topic of debate when local actors were engaged in REDD+ preparations. In Ghana, it was mostly official institutions and prominent NGOs that used and adapted remote sensing technology for local biomass monitoring, Carbon stock mapping and the development of national and sub-national MRV systems [46]. Additionally, the economic aspect of REDD+ materiality did not materialize quickly at the local levels. Challenges around land and resource ownership rights and unequal access of communities to forest benefits meant that the translation of Carbon finance into concrete REDD+ projects with benefit sharing was slow. In the meantime, most public REDD+ funds flowed to large, government-led initiatives that deployed relatively few resources piloting and testing [7].

3.1.3. Competences: Standards and Procedures

Global policy development of REDD+ introduced standards and procedures for establishing deforestation rates and baselines for measuring and accounting carbon. New systems for the monitoring, verification, and reporting (MRV) of reduced CO_2 emissions through reduced deforestation, degradation and through forest restoration, made it possible to translate these data into carbon credits. In SW Ghana, competencies to use Geographic Information Systems (GIS), remote sensing, carbon and biomass mapping were mostly introduced and applied by global-local intermediaries such as IUCN, Forest Trends, Katoomba Group and Nature Conservation Research Centre (NCRC) [47]. They worked with the GFC and the Centre for Remote Sensing and Geographic Information Services of the University of Ghana. Local actors were only in some cases involved for on-the-ground verification and to achieve greater accuracy and inclusion [48]. Maps showing trends of deforestation and established baselines were important to prioritize REDD+ action, and to have a reference against which it could be established that REDD+ action would be additional [49]. The mastering of these skills and the resulting calculations and mappings helped organizations in Ghana to promote the argumentation behind REDD+ (meaning) but also made it possible to attract REDD+ finance from international donors. It illustrates that the possibilities for the elements of ideas, materiality, and competences to be linked, contributed to the creation of unity of REDD+ practice.

3.1.4. The Role of Global-Local Intermediary Organziations

The introduction of REDD+ was dominated by organizations that served as intermediary between global and local levels of forest governance. These intermediaries were often NGOs that prioritized the introduction of REDD+ information and ideas to local actors. Technologies, resources, standards, and procedures were however more likely to be overlooked at lower levels of governance. An additional challenge for REDD+ was that REDD+ intermediaries initially did not connect to actors and spaces that represented the larger industrial complex behind deforestation. The dominating idea was that local communities had to be in charge of, and benefit from, REDD+, even when REDD+ introductions were not considered to be truly bottom-up. REDD+ intermediaries had an advantage over local actors because they had access to global ideas and knowledge about REDD+, they took a lead in the disbursement of information, and they dominated the recruitment of participants locally. The following sections will detail how these discrepancies were (partially) addressed while REDD+ evolved.

3.2. The Unpacking and Evolution of REDD+ in Southwest Ghana

In this section, we assess how the 'global-local intermediaries' introduced REDD+ and how REDD+ evolved by integrating elements of existing local practices. The results show how different practices link to and follow up on each other, as well as the role that various actors play in this ongoing process of change. We identified several practices that were empirically linked to REDD+ and to REDD+ working groups by the actors in the field. The most important types of practices thus found were (1) community-based conservation; (2) tree planting; (3) agroforestry and sustainable agriculture; and (4) integrated landscape approaches. Each type of practice is analyzed below.

3.2.1. REDD+ and Community-Based Conservation

Meaning

The ideas behind REDD+ resonated well with local meanings in SW Ghana. A total of 18 out of 20 women and men that we interviewed in WAW confirmed that forests and trees were important for their socio-economic development. Many also believed that forests helped buffer against heat, droughts, floods, and disturbed seasons. The idea that protecting forests contributed to a healthy environmental change resonated well with prevailing, local, holistic views of forests as their social, cultural, spiritual, and physical domain [50]. Most respondents related their personal experiences with climate variability to climate change and believed that they contributed to extreme weather events through their own involvement in tree-cutting. This belief and understanding was probably partly a result of the awareness raising and information activities organized as part of REDD+ preparations and earlier conservation practices but some respondents also referred to information about climate change that they received through the media. Local people seemed perceptive even if they were not in a position to fully assess how their contributions stood in comparison to other global forces driving climate change. A local farmer in WAW for example said:

> "In the dry season the trees preserve water. They give us strength because the trees give
> us clean air . . . they prevent high temperatures and heavy rains, we need to protect them
> so we can develop the area well. Streams will (then) never dry up. . . . If we cut the forest,
> rainfall will reduce so in order to get rainfall and promote agriculture, we need to keep
> forests intact."

The global meaning of REDD+ was somewhat less compatible with prevailing assumptions among local actors about the role that forests played in their socio-economic development. One of the underpinning ideas of REDD+ social and environmental safeguards is that local communities will prioritize protecting natural forests because they rely on these forests for food, medicinal plants, proteins, medicinal herbs, water, and fuel. Our analysis of local responses to REDD+ however suggests that there is a mismatch between the assumptions behind REDD+ and those of local communities. As we will see in the following sections, they are often inclined to give priority to development opportunities "outside" the forest.

Materiality

REDD+ initiatives in the study period saw little trickling down of forest and carbon monitoring technologies to the lower levels. Additionally, the introduction of REDD+ carbon payments hardly materialized locally while carbon finance from donors and multilateral initiatives mostly flowed to national programs and agencies. Yet, the prospect of possible economic benefits from REDD+ projects created opportunities for people to think about the role that the marked could have in the management of their forest landscapes. It put the spotlight on prevailing local issues of inequality and the experience of people that they had mostly been barred from protected forests. Local interviewees therefore, when asked about opportunities for economic development from forests, often mentioned

options "outside" the forest, such as agriculture, agro-forestry development, and tree-planting. In the words of a professional working for a local conservation NGO:

> "People might rather not have forests because they are disillusioned with the way in which things used to be managed."

The Secretary of a Community Resource Management Area in WAW summed up that REDD+ sounded great but would not be able to materialize for some time due to persisting tenure insecurity and inadequate benefit sharing arrangements:

> "Because of REDD+ we know what we can achieve one day."

The introduction of REDD+ forced actors engaged in community-based conservation to consider the challenges that local communities faced in receiving formal recognition of informal land tenure and ownership arrangements. Statutory and traditional land tenure arrangements in Ghana overlapped and often conflicted. They were virtually nowhere gazetted, and informal tenure arrangements of settler farmers in SW Ghana did not have any formal legal protection at all [13,31]. Even though the introduction of REDD+ benefits did not materialize, the introduction of REDD+ ideas and discourses helped create renewed urgency for the issues of tenure and rights.

Competences

REDD+ introduced competencies to use forest and carbon monitoring technology as well as standards and procedures for establishing deforestation rates and baselines, and for the measuring and accounting of forest carbon. As these technologies were mostly used by national-level agencies, these competencies did not play a direct role in the reconfiguration of REDD+ at the local levels. The focus on equity and the social and legal dynamics of REDD+ however did trigger a demand for an altogether different set of competencies. Standards and procedures had to be developed to ensure social fairness and avoid further exclusion and marginalization of local communities. Here, something interesting happened. The formulation, adoption and prioritization of environmental and social safeguards as part of international REDD+ program and policy development was a direct response to concerns voiced by local actors and their global-local intermediaries [27]. Support for a social and environmental focus was particularly urgent in SW Ghana where formal and traditional legal systems contradicted and where local tenure was considered insufficiently protected by law [13]. The very early REDD+ piloting that global REDD+ had made possible, helped change global REDD+ in such a way, that it created a demand for standards and procedures for the strengthening and safeguarding of social and environmental benefits [27]. In many cases, local actors were already acquainted with these kinds of standards, because they had been developed as part of earlier conservation practices.

The introduction of REDD+ created fresh "demand" for competencies and procedures to ensure social and environmental safeguards, and the deployment of these local competencies contributed to the development of REDD+ in new directions. In SW Ghana for example, existing community-based conservation practices put a lot of emphasis on the importance that forests played in the social, economic, and cultural lives of local people. Participatory research in WAW showed how cash and non-cash use of forest products helped forest-dependent communities to move out of poverty in the long term [51]. REDD+ consultations and interviews with local men and women in the same areas however suggested that socio-economic development could not come from protecting forests alone. Many respondents believed that the future lay in raising standards of agriculture and tree-planting as well as income generation activities "outside" the forest such as tourism and jobs in the city. In the words of local women living near the Globally Significant Biodiversity Area (GSBA) in WAW:

> "We need knowledge for planting crops, for agricultural improvement, production and output of agriculture of our livelihoods for example not to burn our fields, we need the technological know how to improve that."

> "I will tell that before we benefited from the forests and now we don't get benefits. So maybe we can get additional support from the government. It is best is for someone to come and teach us techniques to multiply agriculture production."

In short, the outcomes of REDD+ stakeholder consultations in areas where global-local intermediaries had worked on community-based conservation generally pointed at a local need for standards and procedures to redress unequal forest and land access rights, and for competencies to create economic value from the forest areas. The following sections will show how different practices of REDD+ integrated responses to these local demands for particular competencies by building on established practices such as tree planting and sustainable agro-forestry.

3.2.2. REDD+ and Tree Planting Practices

Meaning

Local meanings behind tree planting resonated well with REDD+ meaning. People felt that bringing back trees on deforested and degraded lands were good for themselves and for nature. It also helped them buffer against the impacts of extreme weather. For local people, it was easier to see that they could reap benefits from planting trees than from not cutting naturally growing trees that someone else might cut anyway. In areas where deforestation took place and where individual land rights were not well-defined, it would be difficult to attribute reduced deforestation to individual action and individual people in order to distribute benefits as a reward [52]. The perception was also different because local people could claim rights over planted trees but not over naturally growing trees. Cutting trees was a way for farmers to affirm their right over land tenure and cocoa farmers were afraid to let trees mature in their cocoa farms because licensed loggers were allowed to harvest naturally growing trees, causing damage to crops in the process [28,31]. Reserves or forests nominally owned by traditional authorities were generally treated as common pool resources, resulting in widespread illegal deforestation and forest degradation [31].

Materiality

In Ghana, tree planting could more easily be translated into material gains, because each person that planted and took care of a certain number of trees, would be able to receive incentives or compensation, and could also use other products of the tree. As local farmers said:

> "Local people don't want to invest in not using forest for 20 years. If they plant trees such as rubber, they will at least receive income at some point."

A local timber company explained:

> "For example, in this REDD+ area, we can give them (local smallholders) incentives to plant trees and then maybe go further, to help them establish small scale saw mills where they process the wood for charcoal, preserve the wood for their daily lives, timber for their domestic use, and then to sell to the local market."

As REDD+ was negotiated at the global levels, many campaign NGOs had criticized this component of the scope of REDD+ out of concern that large scale plantation companies could access REDD+ finance [27]. The above quotes of local actors illustrate that the options for "forest restoration" could indeed be used by plantation companies, but that it also created opportunities to address the needs of local actors. This potential for tree planting and plantation management was strongly represented in early REDD+ proposals and plans in Ghana. The planting of community woodlots for charcoal and fuelwood production, for example, was a main focus area for the REDD+ Readiness Preparation Proposal of the Government of Ghana. The World Bank Forest Investment Program (FIP) and the Government of Ghana also looked into possibilities to support forest restoration and plantation management under REDD+ in Ghana [53]. The FIP was set up to bridge early phases of

REDD+ readiness preparations with future private sector investments [27]. In Ghana, it financed a timber plantation initiative by the Dutch company Form International, a company that had already independently produced Voluntary Carbon Standard (VCS)-certified REDD+ Carbon Credits in their inclusive and sustainable plantation program in Ghana.

Competences

Tree planting practices in Ghana also included important competencies for the clarification of rights that combined well with REDD+. The rights that local people held over planted trees were laid down in the constitution of Ghana [54,55]. In many areas in SW Ghana, local farmers did not know how to assert this right or were not even aware of it, but global-local intermediaries introduced standards and procedures to create awareness and recognition of these rights. Already before REDD+ introductions started earnestly, global-local intermediaries such as IUCN had worked with local actors on the clarification and formalization of this right. They had raised awareness among local bureaucrats and smallholders about existing regulations on the ownership of planted trees, and had developed tree registration procedures with local authorities [56]. The certainty over rights, the prospect of future returns in timber, and possible carbon payments triggered small NGOs and land owners to start small plantations, even though national and local REDD+ monitoring systems were not yet in place. One local farmer in WAW for example was not part of a formal REDD+ project and would alone never be able to produce verified carbon credits. The costs of most certification were so high that it was generally accepted that hundreds of smallholders would have to be aggregated to have the scale needed to carry such investments and generate enough carbon credits to be able to recover upfront investments. He had set up his own mini plantation anyway:

> "I heard a lot on the radio about the money that we could receive for trees. When I decided to have my own little tree plantation early on, many people in my village thought I was crazy, but now that the trees are maturing, they see that I am already reaping benefits, for the community and for my family, regardless of any payments I might receive from carbon or not."

Additionally, larger-scale plantation initiatives and policies included provisions to protect the rights of local people and make the sharing of benefits possible. One such provision was the Modified Taungya System (MTS), a forestry system that involved inter-planting trees with agricultural crops. Respondents regularly suggested that the competences developed under MTS served as an example how benefit sharing could be possible under REDD+.

3.2.3. REDD+, Agro-Forestry, and Sustainable Agriculture Practices

Meaning

As the development of REDD+ progressed in Ghana, its focus gradually shifted to sustainable agroforestry systems and tree planting. Smallholder agro-forestry cocoa production had been a main contributor to the gradual degradation and destruction of biodiversity-rich and high-carbon rainforest in SW Ghana [57]. With a main focus on carbon and avoiding deforestation, the global meaning of REDD+ nevertheless converged well with the meaning of sustainable agro-forestry practices. REDD+ proponents developed programs that focused on increasing per-hectare cocoa yields, improving input management and certified crops. These approaches shared ideas with REDD+ on reducing deforestation, reducing CO_2 emissions, and creating outcomes for local communities.

Materiality

Creating economic return from sustainable agro-forestry presented REDD+ with an alternative for carbon finance. The one-million USD 'Climate Cocoa Partnership for REDD+ Preparation' of Rainforest Alliance International and trading company Olam International in the Juabeso-Bia District

in SW Ghana for example made that shift. The project focused on generating increased income from sustainable cocoa production and biodiversity protection through bringing back shade trees and forest protection. A Landscape Management Board consisting of community representatives was set up. The project achieved positive outcomes for communities and biodiversity, but it did not produce verified CO_2 emissions. In the end, the project was not a success because it cost more than the premium sale of sustainable cocoa could deliver. There was also some misunderstanding between the different parties whether REDD+ credits would be generated. The project however showed that the materiality of reducing Carbon emissions and deforestation in (agro-) forestry practices combined well with the idea of REDD+ to address social, environmental and climate objectives simultaneously. This new combination of elements developed also internationally under the term Climate Smart Agriculture (CSA). FAO [58] defines CSA as "an agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation) while enhancing the achievement".

Competences

Sustainable agriculture and agro-forestry practices presented REDD+ with standards and procedures that helped farmers create more return from their fields and competencies to improve their rights. In established sustainable agro-forestry practices, smallholder cocoa farmers were trained in competencies to apply fertilizers and other farm inputs. These meant that these famers could increase their income and have more stable harvests. The planting of trees for shade was also encouraged, and this contributed to the halting of deforestation and the protection of biodiversity. Additionally, it could, if needed, be translated in reduced CO_2 emissions and increased carbon sequestration. Sustainable cocoa agro-forestry presented REDD+ with standards and procedures to achieve social and environmental REDD+ objectives such as increased income, gender inclusiveness, improved input management and soil treatment. It fitted the need for REDD+ to diversify income streams.

3.2.4. Integrated Landscape Approaches to REDD+ in SW Ghana

Meaning

After 2010 and 2013, global-local REDD+ intermediaries in Ghana collaborated to develop landscape approaches to REDD+. These approaches integrated ideas about conservation, inclusive governance, soil and water conservation, sustainable agricultural intensification and the re-planting of shade trees as a means to reduce CO_2 emissions from the landscape and achieve additional social and environmental benefits. In Ghana, a civil society initiative of NGOs, traditional leaders, cocoa trading companies, farmer cooperatives, insurance companies, consultancy firms, certifying agencies and scientists worked with the country's REDD+ Secretariat and Cocoa Board to develop Ghana's 'Emission Reductions Program for the Cocoa Forest Mosaic Landscape' [59,60]. Leading actors in this movement were also actively involved in global trends to integrate elements of REDD+, sustainable agro-forestry, and Climate Smart Agriculture in landscape and jurisdictional approaches [61]. During that time, the landscape approach became a dominant REDD+ discourse globally. It added the idea of territoriality, which according to some actors is problematic because landscape boundaries do not correlate to administrative-political boundaries [12]. The landscape approach nevertheless provided a useful concept that helped in the linking of the elements of materiality and competencies and thus in reproducing REDD+ towards new directions.

Materiality

With the broadening of the scope of REDD+ landscape approaches, the element of carbon monitoring and accounting found new connection with other elements of REDD+ practice. Whereas project-based REDD+ did not "land" due to faltering carbon markets, the scale of large multilateral and donor REDD+ finance arrangements fitted well with landscape and jurisdictional approaches to REDD+. In Ghana, the Cocoa Forest Landscape Mosaic program successfully applied for funding

from the World Bank Carbon Fund. On-the-ground preparations for REDD+ in the cocoa sector were a continuous process where focus gradually shifted from individual projects and carbon finance to creating economic value from climate smart agriculture in a landscape approach. In the words of a professional working on the program:

> "Finally (after years of REDD+ preparations) we sat down with the community and looked at the landscape. And we decided there was no play for REDD+ because carbon finance could not come from reduced deforestation alone. We therefore decided to go for Climate Smart Cocoa."

In 2014, this cocoa landscape program managed to secure the commitment of at least 40 million USD in funding from the World Bank's Carbon Fund to demonstrate REDD+ on a landscape scale [62]. In the next section, we further explain the success of this particular program and the finance it was able to attract.

Competences

The Cocoa Forest Landscape Mosaic program in Ghana was built on a thorough analysis of climate vulnerability in the cocoa sector and the suitability of soils for cocoa production across the landscape. The introduction of procedures for better cocoa planting techniques, farm input use and the planting of shade trees would be crucial to maintain soil productivity and lift farmers out of poverty. Where soils were sub-optimal and climate models were unfavorable, cocoa would have to be taken out of production altogether. However, another set of procedures focused on social inclusion and the clarification of rights: the procedures around the rollout of the Community Resource Management Area (CREMA) model. The CREMA standards and procedures proved a good match with the materiality and meaning of REDD+ landscape approaches.

CREMA became a central component of the development of the Government of Ghana's REDD+ policies and they contributed to the enthusiasm of international donors in the Cocoa Forest Landscape Mosaic program [45,46]. CREMA represented a set of standards and procedures for the devolution of forest resource rights to local communities that had legal backing in Ghana's National Forest and Wildlife Policy [63,64]. NGOs, community groups, and government organizations had years of experience with CREMA as part of community-based conservation and wildlife management [28,65]. In the early 2010s, it became a central element of many REDD+ pilots. In some cases, such as in the Juabeso-Bia project, similar governance structures were designed, modelled on CREMA [66]. For the Cocoa Forest Landscape Mosaic program, CREMA could function as a mini landscape within which the merits of a landscape approach could be combined with the rigor of REDD+ monitoring and verification of reduced deforestation. The interventions and monitoring could subsequently be replicated in new CREMAs and eventually cover the larger landscape. In this way, CREMA was made instrumental in the development of standards and procedures needed to implement REDD+ in a landscape approach.

4. Discussion

The introduction of REDD+ in SW Ghana was not a clear-cut, linear process in which local actors simply implemented global ideas and aspirations. REDD+ was initiated by public, private and non-profit actors that worked across global and local governance scales. They chose sites and got involved in the introduction of REDD+ with local actors with whom they were already involved with in established community-conservation practices. Our practice-based analysis shows how these local actors and global-local intermediaries renegotiated REDD+ and helped shape the evolution of REDD+ at the local, and in return, at the global level. The CREMA model for example, with its procedures for multi-stakeholder collaboration, community consensus building, decision-making, and the formalization of rights, was integrated in various REDD+ initiatives and served to illustrate to international audiences how REDD+ could work at the implementation level [60,63,67].

Applying and refining the framework for studying practices of Shove et al. [33] helped us understand how actors involved in the local introduction of REDD+ combined REDD+ meaning, materiality, and competences with elements of local practices. First, REDD+ ideas about the importance to protect forests resonated well with local ideas and beliefs about the important role that forests played in livelihoods and cultural development of local actors. These ideas prevailed in established practices and, as a result, these practices provided entry points for the introduction of REDD+. Prevailing ideas about the importance of ecologically healthy forests for example helped people realize the assertion of REDD+ that forests also play important roles in reducing the impacts of extreme weather events and climate change. The introduction of REDD+ in Ghana however also exposed divergence between global and local understanding of the role that forests can play in the development of community benefits. Specifically, global ideas on REDD+ underplayed the trade-offs between social and environmental interests in local practice.

The introduction of REDD+ and concerns over social issues created a demand for competences for the organizing of multi-stakeholder engagement, participatory decision-making making, the formalization of rights, and the development of benefit distribution mechanisms. Global negotiations over REDD+ policies and programs started to prioritize social, environmental and governance issues over technical issues of monitoring and this led to the adoption of social and environmental safeguards at COP15 [27]. This shift in thinking at the global level was at least partly a result of early REDD+ introductions and testing at the local levels, such as in SW Ghana [27]. The reshaping of REDD+ on the ground happened in interaction with developments at the global levels, and it was the result of an enactment of REDD+ in the context of established practices in which global-local and local actors were jointly involved. Therefore, as carbon finance moved to the background, established practices such as the creation of economic value tree planting, sustainable agro-forestry, and CSA complemented or replaced this material element of REDD+ practice.

Third, when looking at the material element of REDD+ it transpired that local people welcomed the introduction of carbon finance or other forms of economic value for forests and that monitoring was less relevant in the absence of well-functioning global carbon markets. However, they expressed serious doubts that REDD+ benefits would be effectively and fairly shared among local communities. Their concern was based on past experiences of being denied their rights over natural resources. Neither local nor global-local intermediary actors that were involved in the introduction of REDD+ in SW Ghana considered this the end of REDD+. Instead, at REDD+ introductory and preparatory meetings, people that were involved in the introduction of REDD+ often stressed that REDD+ created opportunities to put concerns over rights and inclusive governance on national and local political agendas.

Our case of in SW Ghana illustrates that global-local intermediaries played an important role in the development of REDD+ pilots. Local community members, local government agencies, and local private sector actors depend on these global-local intermediary actors to provide ideas and information about new technologies, instructions, and skills. Many authors confirm that global policy processes are a source for ideas and discourses [11,12]. What our research shows is that these global processes equally depend on the materiality and competences that form the elements of local practice. The global-local intermediaries that led introductions of REDD+ at the local levels did not only shape the introduction of REDD+ locally, but also influenced the development of REDD+ at the global levels, together with actors involved in the introduction of REDD+ in other countries [27]. As early as 2008, and through 2012, lessons from REDD+ introductions, pilots, and dialogues in SW Ghana reached global REDD+ debates [28,31,68–71]. The mobility of REDD+ to move from the local to the international levels continues to be relevant today, as global negotiations over REDD+ policies and programs are ongoing along with critical debate about the effectiveness and inclusiveness of REDD+ [24,25].

This channeling of ideas, experiences, competences, information and alternatives up and down the global-local nexus make the global-local intermediaries look like "spiders" in a web. They take the lead in initiating REDD+ locally; in choosing sites for REDD+ introduction, and in the recruitment of

local actors. The spiders dominate the process, manage to maintain their place in the web of networks and relations along which elements of REDD+ practices travel from the global to new places such as in SW Ghana. These actors enjoy a position of comparative advantage, having "access" both to local and global ideas, competencies and materialities. Local actors depended on the decisions and resources of these global-local intermediaries, who had comparative advantage over them. Global-local actors in turn also depend on local actors. It was in the joint enactment of established practices with local actors that they could renegotiate and reshape REDD+. By refining the meaning of REDD+ and by absorbing and combining materiality and competences from established practices, global-local actors showed international REDD+ policymakers how REDD+ could work on the ground.

5. Conclusions

Global-local and local actors in SW Ghana continue to develop local interpretations of REDD+ and attract international resources for their initiatives, even while REDD+ is declared "dead" by some [24]. This shows the importance of understanding of REDD+ as part of the global-local nexus of governance [7] By considering the connections between forest governance levels and the key role that both local and local-global actors played, REDD+ is shown to evolve in response to local needs, rather than simply failing to live up to the first ideas that were articulated at the global policy level. While none of the resulting REDD+ initiatives in SW Ghana are 'schoolbook' examples of reducing deforestation and forest degradation through carbon finance based on verified emissions reductions, they are actively changing local practice of tropical forest conservation. Moreover, even when it is too early to tell if those REDD+ projects or programs managed to create a breakthrough in entrenched issues of poverty, social exclusion and a lack of rights, we do see increased attention for these issues, also on a global level.

Ambiguous results do not mean that REDD+ merely reinforced a status quo or contributed to "business as usual". Confronted with REDD+, local actors used their situated agency to integrate the meaning, competences, and materiality of global REDD+ in locally established practices of conservation, tree planting, agro-forestry, and integrated landscape management. This enabled them to absorb elements of these practices in REDD+, as they re-negotiated and shaped REDD+ in SW Ghana. In turn, the intermediary global-local actors that initiated and led these REDD+ introductions acted like "spiders" in the web between the global and local levels. They channeled ideas, information and resources from the global to the local levels, chose sites for introduction of REDD+ and recruited local actors for implementation.

The case illustrates how global policy on REDD+ can reach local levels of governance but also what the challenges are. Global-local actors worked from an advantageous situation because they had access to REDD+ ideas and information, techniques and technologies and the necessary competencies to translate it to the local situation. They did, however, depend on the extent to which local actors could make REDD+ work on the ground. Local people had agency that was situated in practices that they are already involved in, and they were the ones to draw on elements which did or did not combine well with elements of REDD+ practice. One of the most important lessons from the example in SW Ghana is that global REDD+ design has underestimated the trade-offs between REDD+ effectiveness to mitigate climate change, to be fair and inclusive, and to halt deforestation and biodiversity loss. When REDD+ was enacted on the ground, this often translated to interesting initiatives with local communities that could combine goals of social development, conservation, and climate mitigation. Whether these local initiatives can in turn provide the basis for a more global answer to political and economic drivers of deforestation is still an open question.

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