Ten Years of REDD+: A Critical Review of the Impact of REDD+ on Forest-Dependent Communities

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Abstract: The Reducing Emissions from Deforestation and Forest Degradation program, or REDD+, has been the international community's first real attempt to create a global forest governance system which would impact countries on national, regional and even local scales. This paper provides an in-depth analysis on the impact of REDD+ on forest-dependent communities. The dimensions which are included in this review are institutions and governance, livelihoods, socio-cultural aspects, and the environment. Many studies confirm that forest-dependent communities are not sufficiently involved in current REDD+ projects. Furthermore, current and potential impacts of REDD+ on communities often disrupt local peoples' livelihoods and strategies, institutions and socio-cultural systems in various ways, such as unequal benefit sharing, food insecurity, introduction of new powerful stakeholders, illegal land acquisition, unfair free prior and informed consent, and the introduction of monoculture plantations. REDD+ is also perceived as a neoliberal mechanism which renegotiates peoples' relationship with the natural environment by monetizing nature. The paper concludes with a framework which addresses the potential drivers and threats of REDD+ concerning forest-dependent communities based on the literature review. This framework suggests a holistic approach to REDD+ implementation, which incorporates forest-dependent communities' often complex relationship with the natural environment, such as incorporation of traditional forest management systems and provision of viable alternatives to loss of agricultural land.

Keywords: REDD+; forest-dependent communities; forest governance; livelihoods; global climate change

1. Introduction

Forest-dependent communities, consisting of approximately 300 million people in 2000 [1], occupy around 80% of the planet's biodiversity and ecosystems and legally own at least 11% of the world's forestland [2]. The natural environment, which is essential for their survival, forms an important and integral part of many forest-dependent and indigenous communities' livelihoods, institutions, cultures, social relations, and identities [2,3]. However, in the age of global climate change and globalization, depending on natural resources and living in rural areas pose a significant challenge for these communities. Forest-dependent communities are therefore among the most vulnerable peoples to global climate change [4]. There is, however, increasing evidence that forest-dependent communities are able to cope with the negative effects of global climate change through the sustainable management of forests [2,4]. These strategies include traditional forest management systems, knowledge and institutions, and low-carbon livelihood activities.

At the other end of the spectrum, on the global scale, international actors also aim to combat global climate change through forest management. The Reducing Emissions from Deforestation and Forest Degradation program, or REDD+, has been the international community's first real attempt to create a global forest governance system which would impact countries on national, regional and even local scales [5]. Reducing emissions from deforestation in developing countries was first discussed in 2005 by the Coalition of Rainforest Nations, a group led by Papua New Guinea at the 11th Conferences of the Parties (COP11) to the United Nations Framework Convention on Climate Change (UNFCCC). This initiative initially focused on avoided deforestation (RED) and later on it also dealt with avoided forest degradation (REDD). Finally, at COP 13 in Bali, Indonesia the global initiative became REDD+, which also concerned sustainable management of forests, enhancement of carbon stocks and improved forest protection. Currently, the two main multilateral readiness platforms for REDD+ are the United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and the Forest Carbon Partnership Facility (FCPF) of the World Bank. In addition, various other actors are also involved in REDD+ implementation, such as governments, private actors, and NGOs. However, until now, no country is operating REDD+ on a national level yet [5,6].

Traditionally, the three major challenges which are often associated with REDD+ are: leakage, permanence and additionality [7]. Leakage refers to the movement of economic destructive activities to another location because of a REDD+ project. Therefore, a national REDD+ program is more favorable than several REDD+ projects, because the former could reduce the risk of leakage within a country. Permanence refers to the risk that carbon is just temporarily stored in the forests. There is no guarantee that this stored carbon will not be emitted in the future because of economic destructive activities or natural hazards. Additionality refers to the risk that reduced carbon emissions would have occurred anyway even without REDD+ payments [7–9].

Both REDD+ and climate change are global phenomena affecting local forest-dependent communities. This review will focus on the potential positive and negative impacts of REDD+ on forest-dependent communities, as well as the potential threats and opportunities of the program. It also investigates the lessons learned from existing REDD+ pilot projects. REDD+ could impact forest-dependent communities through four dimensions, namely: environmental, institutional, socio-cultural and livelihoods (Figure 1). These dimensions have been chosen because they cover forest-dependent communities' often complex relationship with the surrounding environment, and because local forest management activities often operate through these dimensions. Moreover, these dimensions are interconnected and overlap one another—e.g., a negative environmental impact might affect livelihoods (e.g., food security), institutions (e.g., ways of the forest management), and socio-cultural aspects (e.g., disappearance of sacred forests) (See also: [2,3]).

Following the four dimensions in Figure 1, this review aims to answer the following questions: (1) How does REDD+ affect institutions and forest governance systems? (2) How are livelihoods, both positively and negatively, affected by REDD+? (3) Does REDD+ sufficiently incorporate socio-cultural aspects in avoiding deforestation and forest degradation, if no what are its (potential) impacts?; and lastly, (4) What is the environmental scope of REDD+ and does REDD+ threaten or enhance biodiversity? These four questions justify a need for a review on the impact of REDD+ on forest-dependent communities. After ten years of REDD+ activities, what have we finally learned about the impact of REDD+ on forest-dependent communities in developing countries? Through an in-depth analysis of academic studies, policy documents and "grey" literature, we aim to answer this question.

This paper is further divided into seven sections. The next section firstly discusses UN-REDD and the FCPF, since these programs operate on a multilateral level in order to combat leakage, permanence and additionality. Each subsequent section of this paper explores the impact of REDD+ on institutions and governance systems, livelihoods, socio-cultural systems, and the environment respectively.

Section 7 is the discussion and conclusion. In this section, a framework is presented to analyze the complex relation between forest-dependent communities and REDD+ implementation.
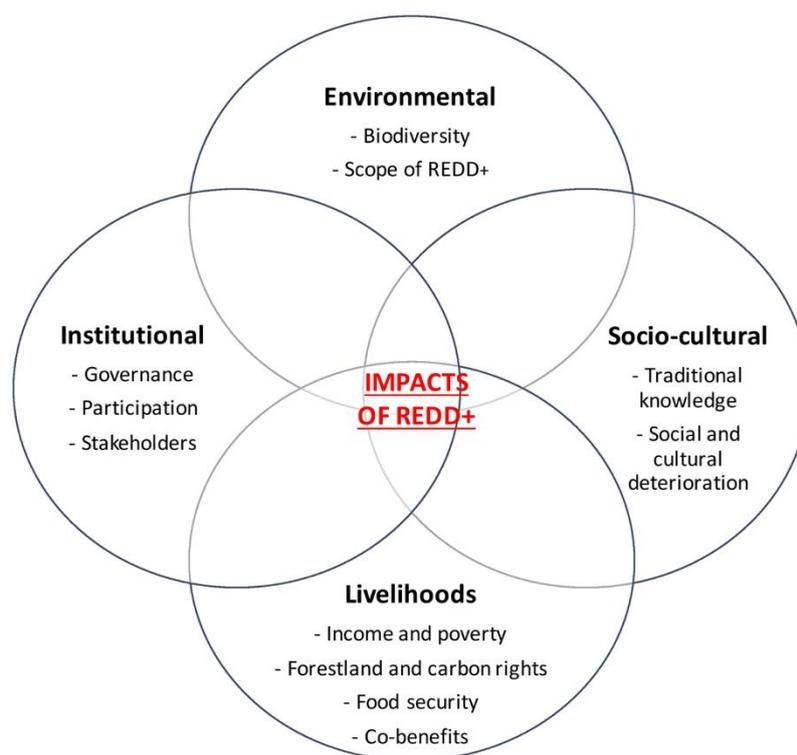

Figure 1. Dimensions of how REDD+ could impact forest-dependent communities.

2. The UN-REDD Program and the FCPF

To understand how REDD+ affects forest-dependent communities, it is important to explore how both UN-REDD and the FCPF incorporate the involvement of forest-dependent and local communities in their policy documents as well as how they define social safeguards and the co-benefits of REDD+. Are there any discrepancies between policy and the situation on the ground?

2.1. The UN-REDD Program

The United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) was established in September 2008, as a result of the decisions made in COP13 under the Bali Action Plan, to create a global partnership between developing and developed countries to significantly reduce emissions from deforestation and forest degradation and to enhance the sustainable management of forests and social safeguards. Herein, developing countries (Non-Annex I countries of the UNFCCC) have the obligation to embark on low-carbon climate resilient development, and developed countries (Annex I countries) have the obligation to provide predictable and significant funding as an incentive for reduced forest-based carbon emissions. The UN-REDD program is implemented by three UN agencies: the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Program (UNDP), and the United Nations Environment Program (UNEP). The UN-REDD program works in close partnership with other REDD+ programs, such as the Forest Carbon Partnership Facility of the World Bank, and the Forest Investment Program [10,11].

After the COP16 in Cancun in December 2010, the decision was made not only to mitigate climate change by reducing emissions from deforestation and forest degradation, but also through the conservation of carbon stocks, sustainable management of forests, and enhancement of carbon

stocks—e.g., through reforestation or afforestation. These REDD+ activities should be: country driven, consistent with the objective of environmental integrity and take the multiple functions of forests and ecosystems into account, implemented in the context of sustainable development and poverty reduction, consistent with the adaptation needs of the country, results based and, lastly, promote the sustainable management of forests [12].

Decision 1/C.16 of COP16 states that each REDD+ country needs to develop a national strategy or action plan, a national forest reference emission level, a national monitoring system, and a system which provides information about how safeguards are being addressed and respected. Decision 1/C.16 promulgates that the following safeguards should be followed to mitigate the negative impacts of REDD+ activities [12]:

- REDD+ activities are consistent with objectives of national forest programs and international conventions and agreements.
- Transparent and effective national forest governance, which takes a nation's sovereignty and national legislation into account.
- Respect for the knowledge and rights of indigenous and local communities, taking international treaties and conventions into account.
- Full and effective participation of relevant stakeholders, and indigenous and local communities in particular.
- REDD+ activities are consistent with the conservation of natural forests and biodiversity.
- Actions to address the risks and reversals, and to reduce displacement of emissions.

UN-REDD consists of three phases. Phase I deals with the development of national strategies or action plans, policies and measures, and capacity building. Phase II concerns the implementation of national policies, measures and strategies or action plans that could further deal with capacity building, technology, development and transfer, and results-based demonstration activities. Phase III deals with results-based actions that could be fully measured, reported, and verified [10]. As of December 2013, 49 countries were participating in UN-REDD, and 18 countries had established national programs [13].

2.2. Forest Carbon Partnership Facility (FCPF)

Working in close partnership with UN-REDD, the World Bank launched in 2007 the Forest Carbon Partnership Facility (FCPF) to assist developing countries to implement REDD+. The FCPF includes Readiness Mechanisms to improve the capacity of developing countries to implement and participate in REDD+ activities. In order for countries to be eligible to receive funding from the World Bank and donor countries, they need to submit Readiness Plan Idea Notes (R-PIN) to develop a Readiness Plan (R-Plan). The R-Plan further elaborates on the R-PIN and presents a more detailed and comprehensive strategy for realizing REDD+ at the national level. The R-Plan should consist of three parts: A national reference scenario of deforestation; a monitoring system for REDD+; and a national strategy for reducing deforestation and forest degradation. However, the World Bank also requires a participating country to properly address relevant issues in their R-Plans which include: Equitable benefit sharing; promotion of future large-scale positive incentives for REDD+; enhancement of livelihoods of local communities; carbon ownership; involvement of forest-dependent and indigenous communities; and conservation of biodiversity. Countries which have successfully participated in Readiness Mechanisms may be selected on a voluntary basis to participate in Carbon Finance Mechanisms. Through these mechanisms, the FCPF will pilot incentive payments for REDD+ policies and measures. As of May 2016, 47 developing countries participate in the FCPF of which 37 of them have signed Readiness Fund grants and 18 countries will be funded through Carbon Finance Mechanisms [14].

The FCPF acknowledges that each R-Plan should be country specific and adapted to the national (or regional) context. This means that each participating country can define or formulate carbon ownership, forest tenure, and the involvement of forest-dependent communities or biodiversity conservation in their own way. A study of Davis et al. [15] on countries' R-PINS shows that there are

huge discrepancies among participating countries in defining these aspects. This could potentially be problematic because countries could share fundamentally different views on tenure, involvement, governance or meaningful participation.

From analyzing policy documents on UN-REDD and FCPF, it can be concluded that both multilateral agencies do acknowledge the importance of the inclusion of institutions, governance, sustainable livelihoods, social-cultural aspects and conservation of biodiversity in REDD+. However, as mentioned above, each country is able to interpret and formulate these aspects in their own way. There are no formal guidelines or binding policies to formulate and implement social safeguards [15]. Therefore, REDD+ could have different impacts on forest-dependent communities depending on how social safeguards are defined and implemented and, hence, there is need to review these (potential) impacts. Therefore, the next sections of this review explore in what way there are discrepancies between policy and actual implementation.

3. Institutional Impact

Over the past 25 years, forests management systems in many developing countries have decentralized, allowing local actors and institutions to have increased rights, responsibilities and decision making power over the natural resources they manage or control [16,17]. Various authors [18,19] have pointed out that decentralized forest management and local institutions are crucial for sustainable forest conservation and community livelihood development. However, REDD+ could reverse current trends in the forest governance structures of REDD+ countries. How does REDD+ affect forest governance systems, involvement of local people, and institutions?

3.1. Restructuring of Forest Governance

REDD+ is a global initiative which is being inserted in pre-existing social and legal institutional landscapes which may dramatically reshape and change governance systems [20]. REDD+ may undermine the decentralization of forest management systems in developing countries [7,16,21–24]. Governments could be inclined to recentralize their forest management systems, because REDD+ requires governments to establish national carbon-oriented forest management plans, reliable baseline data, MRV mechanisms, and national institutions for the trading and payment of carbon stocks in the forests [16]. Phelps et al. [16] state that: "These demands would impose prohibitive costs for small-scale initiatives, but a centralized system would benefit from economies of scale, coordination, and standardization" (p. 12). A national approach to REDD+ could generate greater emissions reductions at a lower cost, however, bureaucracy and corruption could render a national approach inefficient and counter effective [25]. Centralized forest governance could lead in countries with weak or no safeguards to a greater forest loss and lower forest-related benefits for forest-dependent communities, and the poor in particular [21].

Governments could also have political and financial incentives to recentralize forest governance, since REDD+ could allow governments to have higher revenues from the forests. Especially in countries with weak rule of law, a high level of corruption, and low levels of public accountability, REDD+ could recentralize local forest tenure rights and decision making power to serve the interests of government institutions and the elite [21]. This could result in local people losing access to forestland and their tenure rights [8].

REDD+ schemes that recognize the need for improvements in forest governance have the potential to enhance forest conservation and to improve livelihood benefits for the poor [21]. Therefore, Phelps et al. [16] state that the affected forest-dependent communities should have control over local REDD+ design and implementation. Being provided with the right information, local communities should not only have the right to decide whether they want to engage in a REDD+ project, but they should also be in charge of the local management, monitoring and enforcement processes as well as receiving the REDD+ payments of the carbon stocks they protect. They need to be engaged in all phases of a REDD+ project [26]. Sandbrook et al. [21] state that REDD+ interventions should not only

focus on lower terrestrial emissions. REDD+ implementers need to invest in the capacity building of local communities to demand accountability in forest governance processes. Furthermore, better forest governance needs third party forest monitoring, transparency, and a stronger support to civil society networks.

Because rulemaking autonomy in forest management matters, REDD+ needs to devise appropriate local institutional architectures and effectively nest community engagement in forest conservation within broader national governance regimes [22]. One approach to improve forest governance in a REDD+ scheme is the nested approach. A nested approach is defined by Angelsen et al. [25] as an approach in which countries could start subnational activities on REDD+ and gradually move to a national approach. This approach allows both the national and subnational level to reap the benefits of REDD+ in which carbon credits are generated by both projects and national programs. Nested institutional arrangements that effectively support local forest governance are needed to protect and enhance carbon stocks in the forests and simultaneously improve the livelihoods of the affected local and forest-dependent communities [22].

The outcomes of COP16 encourage countries to participate in REDD+ readiness activities, such as institutional strengthening, national MRV systems, and so on. These activities will not be implemented all at once but in several phases—therefore adopting the principles of the nested approach [27]. A nested approach provides, however, many challenges to harmonize the national and subnational levels in achieving these goals. A study of Ravikumar et al. [28] focused on 23 subnational REDD+ initiatives in six countries and they conclude that multilevel governance challenges relate to vertical coordination and information sharing as well as horizontal and inter-sectoral tensions. These challenges furthermore concerned accountability, equity and justice. In order to overcome these challenges, there needs to be a thorough understanding of the interests and power relations among actors at different governance levels [28]. The nested-approach has been widely acknowledged by countries that developed Readiness Preparation Proposals (R-PPs) as part of the World Bank's FCPF. However, instead of implementing a nested-approach on the long-term, countries rather perceive this approach as an interim solution in the process of establishing a national accounting system [29]. Most countries still require REDD+ payments to be handled and distributed through the national level. These countries fail to outline how local institutions could play a role in REDD+ benefit distribution [29,30]. Also, countries seldom outline in their R-PPs how to develop their envisioned sub-national reference levels. Vijge et al. [29] therefore conclude that REDD+ could lead to a centralization of forest governance rather than further decentralization.

3.2. Funding of REDD+ and Multi-level Governance

How REDD+ will be funded remains a matter of debate. Questions which arise include: will REDD+ be funded by international or voluntary carbon markets, or through international development assistance? Should REDD+ be considered as a program or does it need to be implemented in stand-alone projects? Furthermore, should REDD+ be based on bilateral or multilateral cooperation, and on which scale level will REDD+ be most effective? On national or subnational scale? It also remains unclear how the private and public sectors will interact, and who is willing to invest in REDD+ [31].

Countries which developed their R-PPs both implicitly and explicitly assumed that REDD+ would be funded through market-based mechanisms. However, only a few countries had a clear indication of the type of REDD+ funding they envisioned as well as the institutional arrangements to stimulate the acquisition of REDD+ funding [6,29]. Most REDD+ countries seem to take a passive approach to these issues and they expect future COP meetings to resolve this issue [29].

3.3. Exclusion of Local People

REDD+ needs to be examined as a new environmental governance structure [32]. Policy makers and scholars must pay more attention to issues such as land tenure, property rights and the distribution

of benefits under REDD+. While these topics are widely acknowledged in the REDD+ debate and by participating countries, there remain huge discrepancies in how countries perceive these issues. For example, Vietnam, a country participating in both UN-REDD and FCPF, allocates land to households for long-term use, but it still stipulates land use and management [3]. Only if REDD+ aligns the interests of all the stakeholders, and communities in particular, will forest conservation and carbon stock enhancement most likely be realized. This alignment can take shape if the participation of affected communities is facilitated in the REDD+ process. Global decision-making needs to include methods that engage representatives of various non-state interests, such as local communities, in order for REDD+ to succeed [33]. Engagement can take on various forms. Danielsen et al. [34], for example, explore the involvement of local communities in participatory carbon monitoring and they conclude that it may significantly improve the capacity of developing countries to deliver large cuts in greenhouse gas (GHG) emissions at a low cost within a short time frame. An effective way of community involvement in REDD+ could be the incorporation of traditional knowledge and institutions [35]. Loaiza et al. [35] state that the enforcement of intra and intercommunal social capital as well as traditional forms of cooperation could benefit REDD+ greatly.

If REDD+ program is to benefit forest communities it will need to ensure that: (1) Incentives address relevant drivers of deforestation; (2) benefits are equitably distributed; (3) meaningful political participation of forest communities is linked to processes at the national and international levels; and (4) the rights of forest communities, particularly tenure are recognized, secured and strengthened [36].

Both the UN-REDD program and the FCPF [37] have recognized the importance of including indigenous and local communities in REDD+ and stated:

> "[We] recognize the importance and special status of indigenous peoples in terms of their historical and cultural connection to forests and are committed to applying specific policies to safeguard their rights and interests. (p. 2)"

One of these safeguards is the guidelines on Free Prior and Informed Consent (FPIC). True FPIC concerns: Informing local communities about the positive and negative impacts on REDD+; allowing local communities to vote on whether or not to implement REDD+; and involving them in every step of REDD+ implementation. However, there are many concerns that countries do not recognize the rights of their indigenous peoples and communities, and therefore use FPIC merely as tokenism, rather than a normative framework and a binding policy [38].

In selected REDD+ pilot sites in Tanzania and Papua New-Guinea, the affected communities received little information about the project, and only a few privileged villagers had knowledge on REDD+ [39,40]. In Cameroon, villagers in selected REDD+ projects were aware of the project. However, they were unaware of what carbon really is and what it can generate. This situation could increase uncertainty, distrust, discouragement, and inefficiency of REDD+ in the long term [41].

Vietnam is the first UN-REDD country which applied FPIC in its pilot project in Lam Dong province. However, according to an external evaluation of the RECOFTC, the government could not provide all the relevant information on REDD+ to the local people such as the risks and costs associated with the program. Second, there was also a lack of time for internal discussion. Third, there were no grievance and review mechanisms, and people could not address their concerns or complaints to an independent institution. Local people in the FPIC process were simply asked whether they wanted their forests to be conserved, in which the villagers answered "yes". While this exercise has been labeled as FPIC, it did not achieve its true objectives and goals [42].

Unless local and forest-dependent communities are able to secure full and effective participation in the development of public policies on REDD+, there is according to Griffiths and Martone [43] a real risk that REDD+ policies and interventions will end up serving the interest of powerful institutions such as formal forest agencies, conservation organizations and local elites.

3.4. Emergence of Private Stakeholders

Countries could get REDD+ funding either through compliance or voluntary carbon markets. Compliance markets rely on international and national legislation and agreements for emissions reduction and include the Clean Development Mechanism and European Union's Emissions Trading Scheme. Voluntary carbon markets are based on decentralized demand for carbon offsets and allow individuals and companies to purchase carbon credits [7]. The Climate, Community and Biodiversity Standard (CCB) and the Verified Carbon Standard (VCS) are guidelines for the voluntary carbon offset industry. The former also evaluates social and environmental impacts of a project, whereas the latter is mainly concerned with carbon offsets.

Terrestrial emissions-based carbon markets will attract a substantial amount of market actors. This could lead to a so-called "global land grab" in which countries with weak or no social safeguard systems sell forestland to transnational companies and other market actors. These actors could consequently push communities out from their lands and forests. Agrawal et al. [7] state that countries need to incorporate stronger safeguards protecting the interests of forest-dependent communities in the context of terrestrial emissions reduction efforts.

A study of Asia Indigenous Peoples Pact (AIPP) [38] mentions the threat of the emergence of market actors, or so-called "carbon cowboys", who are entering indigenous and traditional owned forests to profit from the value of carbon and carbon market speculation. A study of Espinoza Llanos and Feather [44] has effectively shown that without proper community consultation and FPIC, lack of national guidelines, and weak social safeguards, there has been an explosion of carbon piracy in pilot REDD+ initiatives involving indigenous forest-dependent communities in Peru [44]. These "carbon pirates" convinced these communities to sign away their land and carbon rights in favor of commercial interest which largely ignored the protection of indigenous peoples' fundamental rights. REDD+ unintentionally provided these "carbon pirates" an increasing control over forests and intellectual property of these communities, resulting in manipulation of costs and inequality of distribution of benefits [44]. Therefore, REDD+ schemes should invest in the capacity building and tenure rights of indigenous communities as well as the implementation of safeguards which could prevent "global land grab" [38,44].

4. Livelihood Impact

REDD+ could affect the livelihoods of forest-dependent communities in various ways. REDD+ could contribute to poverty alleviation, provide local households extra income from carbon credit payments, and offer other co-benefits such as improved land tenure or carbon ownership. However, REDD+ could also harm local communities, such as preventing local communities from making use of the forest for subsistence or through unequal benefit sharing. Therefore, this section is divided into the following six subsections: Poverty alleviation; income distribution and equity; forestland tenure and carbon rights; food security; co-benefits; and social safeguards. These subsections aim to explore how REDD+ positively and negatively affects forest-dependent communities' livelihoods.

4.1. REDD+ and Poverty Alleviation

There are two schools of thoughts on REDD+ and livelihoods: The "pro-poor" school and the "do-no-harm" school. The former argues that REDD+ should improve communities' livelihoods concomitantly with REDD+ implementation, whereas the latter school argues that REDD+ should not harm the involved communities [45–47]. There is an essential difference in those approaches, as the pro-poor school treats a REDD+ as an integrated rural development program whereas the other school has a strict carbon dioxide reduction focus. A quantitative study of Sheng et al. [48] shows that depending on the government objective in REDD+ implementation, such as social equity, environmental priority or poverty alleviation, different incentive and tax structures need to be

implemented depending on the respective objective. However, there is a general consensus that the negative impacts of REDD+ on livelihoods should be minimized, its benefits are equitably shared, and there is an adequate participation of local communities in the implementation of REDD+ [47,49].

Wollenberg and Springate-Baginski [36] propose a matrix to analyzing impacts of REDD+ on local livelihoods and governance. They divided the stakeholders of forest management in local households, communities, local governments and the timber industry. Local households could be compensated by REDD+ initiatives for reduced deforestation and income opportunities forgone. Communities could be rewarded with in-kind payments, such as infrastructural improvements, resulting in more efficient land use. Local governments will receive payments for conservation targets and forest management, while local timber companies could be compensated to shift their businesses to plantation forests which should cover at least the transition and transaction costs.

4.2. Income Distribution and Equity

As mentioned in Section 3.2 Funding of REDD+ and Multi-level Governance, it remains unclear how REDD+ will be funded. Regardless of how REDD+ will be funded, REDD+ payments could increase income inequality between communities involved in REDD+ and those not involved in REDD+, and among households having legal land titles, and those that are landless. These inequalities could result in intra- and inter-community conflicts, and a growing economic inequality among households and communities [43].

Stakeholders in REDD+ should recognize and acknowledge tradeoffs between conservation and development [8,26]. Ghazoul et al. [8] argue that REDD+ needs to take all the economic, social and political implications of avoiding deforestation into account. A development of a comprehensive trade-off analysis of REDD+ implementation and a business-as-usual option of commodity production is needed which could reveal the indirect economic, political, and socials costs and benefits of REDD+. While REDD+ could provide a stable income and guaranteed payments, it also has limited potential for economic growth. REDD+ implementation is also subject to inflation and it restricts opportunities for downstream industries. REDD+ implementation, opposed to the business-as-usual option, is furthermore dependent on external financing and might constrain future livelihood options. Other potential socio-economic risks of REDD+ implementation are: Reduced tax income; the risk of government investments being diverted elsewhere, rural-to-urban migration; and changing political-economic ties [8].

There are three paradigms on payment for environmental services schemes including REDD+ [50]. The first paradigm is Commoditized Environmental Services (CES). CES is mostly market driven and is based on performance and outcomes. It does not take a pro-poor stance. The second paradigm is Compensating for Opportunities Skipped (COS). COS includes integrated conservation and rural development approaches. Both CES and COS require measurable targets for contracting environmental services. The third paradigm is Co-Investment in (landscape) Stewardship (CIS). CIS is based mainly on trust and planning, and is mainly used in collectively owned or state-owned land and natural resources. CIS concerns more collective action and payments in-kind. Hoang et al. [50] argue that the various paradigms can be combined at different scales in a REDD+ value-chain which links local actions to global benefits. In a nested approach, CES seems to be most appropriate for a benefit distribution system from the central government to its local agencies, while CIS and COS are more appropriate on grass-roots levels [50] (p. 59).

REDD+ is unlikely to be a driver of poverty alleviation, but it may help in diversifying incomes. Campbell [45] argues that terrestrial emissions reduction efforts could provide financial incentives for shifting cultivators and extensive cattle ranchers. On the other hand, growers of commercial crops or those cutting trees for high-value timber are most likely not able to be compensated by REDD+ for the profits foregone by abandoning forest related economic activities. According to Campbell [45], even smallholder intensive agroforestry is usually more profitable than REDD+ payments.

4.3. Forestland and Carbon Tenure and Rights

In many countries, forests are owned by the State. Many governments often do not take the traditional and customary forestland rights of its indigenous and local communities into account in decisions about land-use zoning and forest management [51]. REDD+ incentives could lead governments to restrict local communities to make use of their traditional and customary lands. Therefore, REDD+ might lead, in the worst case, to the displacement of indigenous and local communities, depriving them of their livelihoods and customary tenure rights [51].

Various studies [7,23,41,51–55] assert that securing tenure over forestland and carbon are necessary steps to be undertaken if REDD+ is to be successful in both forest conservation and livelihood improvement (Land tenure in this study is defined as [56]: "The right, whether defined in customary or statutory terms, that determines who can hold and use land (including forests and other landscapes) and resources, for how long, and under what conditions" (p. 303). Carbon rights can be defined as [57]: "Intangible assets created by legislative and contractual arrangements that allow the recognition of separate benefits arising from the sequestration of carbon in the biomass" (p. 3).). Unclear or insecure tenure rights might even lead to deforestation and forest degradation [58]. Robust forestland tenure, on the other hand, has proven to bring both social and ecological benefits—it could improve communities' livelihoods as well as increase their resilience and adaptive capacity against the impacts of climate change through forest conservation [40].

Securing and distributing tenure rights over forestland and carbon are often crucial in order for local communities to gain from REDD+ payments. It also encourages local communities to be effective conservation agents. They would have more incentives to be involved in all the phases of a REDD+ scheme—ranging from participatory carbon monitoring to having the legal authority to stop illegal forest exploitation by outsiders [59]. Forest users would have few incentives to protect the resources, unless they own or have a stake in it. Unclear or insecure tenure may also lead to the exclusion of local people in REDD+, which could result in conflicts, economic inequality, deprivation of livelihoods, and human rights violations [51,60]. Local people could become so-called REDD+ refugees if they are denied access to the lands they manage and depend on [8].

There are various views on REDD+ and forestland tenure. Some views see REDD+ as a threat to (traditional) forest tenure, while other views see opportunities for REDD+ to secure tenure rights. Nasi et al. [52] see the opportunities and state: "REDD+ could provide big incentives to clarify tenure, alleviating the existing low interest of establishing clear rights because of the widespread inability to recognize fully forest values" (p. 205). Lemaitre [61], on the other hand, argues that adding value to forests might induce governments to exclude indigenous peoples from their lands and deny their traditional land rights.

REDD+ has complicated the relationship between land tenure and forest use, because it remains unclear who owns the carbon rights [62]. Clarifying legal and regulatory frameworks regarding carbon tenure and rights is necessary for a country to be ready for REDD+, especially because most developing countries have yet to define carbon tenure and rights in their domestic legislations [28]. Carbon and forestland tenure often do not overlap. This has proven to be problematic: one could own forestland, but not own its carbon stocks.

Studies on the impact of REDD+ on land tenure in Cameroon [41], Brazil [54], Tanzania [54], Indonesia [54,55] and Vietnam [54] conclude that REDD+ is often implemented in a context in which carbon and land tenure arrangements have not been clearly defined or effectively enforced. This often hinders the progress of REDD+ implementation, even though in the previously mentioned REDD+ schemes the importance of tenure has been widely acknowledged. Securing tenure is furthermore necessary but not sufficient. It needs to be able to compete with other economic interests that emit GHGs. In other words, securing tenure is not the panacea. Effectiveness of REDD+ depends on the ability and interest of local communities to sustainably manage their forests and enhance carbon stocks [55]. A study of To et al. [49] on PES, tenure, and poverty reduction in Vietnam reveals that households with unclear tenure, being often the poorest in their respective communities, have

been excluded altogether from the benefits of PES schemes. In this case, the PES schemes actually impacted the poorest households negatively, and exacerbated income inequality. Highlighting the importance of management rights and control over territories, Loaiza et al. [35] showcase that among indigenous communities in the Ecuadorian Amazon forestland tenure allocation did not necessarily lead to communities having more decision-making power. Traditional institutions and boundaries in particular disappeared concomitantly with the introduction of formal institutions and boundaries. This led to less decision-making power of the local communities.

4.4. Food Security

REDD+ could reduce the availability of potential agricultural land, which could lead to higher land rents and food prices [63]. Suitable land for agriculture will most likely be used for high-valued cash crops for export, resulting in higher land rents and food prices. Subsistence farmers, however, will not be able to exceed the opportunity costs because of their lower economic revenues. This could aggravate poverty and hunger among marginalized people, unable to buy food or practice farming.

In many tropical forests, indigenous and forest-dependent communities practice shifting cultivation for subsistence purposes. Various studies [50,64,65] see shifting cultivation as one of the drivers of deforestation and carbon dioxide emissions. In a REDD+ scheme, shifting cultivation could therefore be prohibited [38]. However, under the right conditions shifting cultivation or swidden agriculture has been proven to be sustainable. It could even enhance biodiversity [18,66–68]. In tropical forests, traditional swidden agriculture is often the most sustainable and secure livelihood strategy [66]. Under a REDD+ scheme, food shortages could occur if swidden agriculture is prohibited, because it remains a question whether other "carbon-friendly" forms of agriculture could make up for the food loss. There is evidence of communities retreating from voluntary PES schemes, after they realized that the scheme increased food insecurity [24]. The resources management strategies promoted by the PES scheme did not comply with local practices and dietary requirements.

Due to high fluctuation of market prices of perennial crops and carbon prices, REDD+ should incorporate swidden agriculture and traditional livelihood practices (such as hunting, fishing, NTFP collection, etc.) in an overall development strategy to ensure subsistence income from various sources as well as food security on the long term [68]. Mutabazi et al. [69] evaluated how REDD+ impacted local livelihoods in Tanzania. Even though REDD+ projects provided co-benefits (see: Section 4.5 Co-benefits) such as new agricultural land for villagers to create a food-buffer, poorer households did not have enough capital to expand their agricultural plots, and were still forced to collect forest products for subsistence purposes.

4.5. Co-benefits

So far, this review has mainly focused on the potential negative impacts of REDD+. This can be justified that in case REDD+ has a neutral or positive impact on local communities no countermeasures have to be undertaken. With a total amount of US$ 73.6 million approved for 18 national programs for the UN-REDD in 2014 [13], it is less likely that the financial benefits of UN-REDD will have an impact on forest-dependent communities. It is therefore important to focus on the co-benefits of REDD+. In the previous sections, we have pointed out that REDD+ could improve forest-tenure, provide income diversification, and greater benefits from ecosystem services could be reaped. Other potential long-term benefits furthermore include a greater adaptive capacity of local communities, improved forest governance, increased transparency and accountability, improved local infrastructure, development of human capital, strengthening of social capital, job creation, and so on [70,71].

4.6. Social Safeguards

Carbon sequestration benefits and risk mitigation receive more emphasis in REDD+ initiatives on the multilateral level, whereas NGO projects appear to place a stronger emphasis on social rights and benefits [72]. As mentioned in Section 2 The UN-REDD Program and the FCPF, multilateral

initiatives like UN-REDD and the FCPF do address social safeguards, but it is not clear how these will be enforced. Outcomes of COP-19 in Warsaw in 2013 state that each two years governments should provide a summary of information on how they are complying with the REDD+ safeguards, as agreed in COP16. Least developed countries are exempted from this rule. Lang [73] evaluates the decision on enforcing the social safeguards in REDD+ as troublesome. There are no mechanisms to verify whether governments are telling the truth nor is it clear what the consequences are if countries do not comply with the social safeguards (see also: Lyster [11]).

5. Socio-Cultural Impact

Many indigenous communities' organizations have long considered themselves as victims of neoliberalism and market policies. REDD+ could also be considered as a neoliberal approach to forest conservation as its main rationale is that forests should be protected in order to get financial benefits from carbon credits. Therefore, various representatives of indigenous peoples have rejected REDD+ [74]. This rejection stems from various critical studies on Payment for Environmental Services (PES) and REDD+ [24,75,76]. These studies argue that PES and REDD+ commodify ecosystems, and that the "neo-liberalization of nature" has severe negative implications for conservation and development, as well as local communities. REDD+ promotes carbon storage and sequestration based on market-based and neo-liberal utilitarian principles. This revaluation of nature and ecosystems promotes a shift in the conservation ethos of powerful stakeholders in nature conservation to monetary profit, supply and demand principles, and opportunity costs [24]. Vijge et al. [29] already observed that the REDD+ countries in their study moved towards the carbonization of forest governance, in which they paid little to no attention to local livelihoods and biodiversity. How does the literature evaluate the impact of REDD+ and the monetarization or carbonization of nature on the social lives and cultures of affected communities? Does REDD+ sufficiently incorporate socio-cultural aspects in avoiding deforestation and forest degradation, if no what are its (potential) impacts?

5.1. Loss of Traditional Knowledge and Practices

Forests form for many indigenous peoples an integral part of their existence [18,38,44]. Therefore, restructuring or banning traditional forest management systems because of REDD+ do not only change local people's forest use practices, but also the ecological, cultural, social, spiritual, political customary, institutional and world-view values which underline and justify it. REDD+ could therefore change communities on various dimensions (Figure 1). A fixation on carbon sequestration and monetary benefits could lead to intended and unintended socio-cultural consequences, which could change indigenous and local communities for the worse.

Being amongst the most vulnerable to climate change, forest-dependent and indigenous communities have traditional knowledge and management systems, which could actually provide effective solutions to climate change mitigation and adaptation [4,18]. Incorporating indigenous and traditional knowledge in REDD+ will not only limit the negative socio-cultural impacts of REDD+, but will also allow stakeholders in forest management to incorporate sustainable traditional and indigenous forest management practices [38,51]. Loaiza et al. [35] prove that in their study site in the Ecuadorian Amazon, traditional knowledge has been especially important for benefit sharing and monitoring activities among the local indigenous communities participating in REDD+.

As mentioned in Section 4.4 Food Security, indigenous and local people could be forced to give up swidden agriculture in a REDD+ scheme. Implementation of REDD+ might therefore negatively influence traditional management systems, which could result in the social disruption of communities and a loss of traditional knowledge and practices [8,77]. Corbera [24] argues that REDD+ could produce a myriad of indirect socio-economic consequences including the further demonization of swidden agricultural practices. Moreover, commenting on the impacts of REDD+ on local peoples' ways of life, AIPP [38] state:

"*There is a concern that forest and natural resource-based livelihoods [of ethnic/indigenous minorities] can be identified as drivers of deforestation and therefore, its practice may be curtailed or banned altogether. [...] These forms of livelihoods are linked to their identities and traditional culture. This will therefore have serious implications on the ways of life, food security and traditional knowledge of ethnic minorities* (p. 11)."

A solution which could include traditional forest management systems in a REDD+ scheme is community-based forest management. Incorporating the success factors identified from research on community-based forest management (CBFM) could enhance the likelihood of success for REDD+ initiatives [35,78–81]. However, CBFM should not be perceived as panacea. A REDD+ project in Nepal had strengthened CBFM conditions, CBFM user groups participated more in activities, their networks were strengthened, and their sources of incomes appeared to be increased [81]. Nonetheless, REDD+ did limit the autonomy of these user groups. Customary institutions also had less decision making power, and forest-dependent communities' access to forests became more restricted. Furthermore, external political agendas increasingly replaced the needs and interests of forest users [81]. Newton et al. [78] conclude that REDD+ could make use of the natural, human, social, and institutional capital associated with CBFM sites to achieve its goals. REDD+ could moreover finance CBFM structures as well as strengthen forest-dependent communities' capacity to engage in REDD+ and conservation activities. On the other hand, existing CBFM practices do not present solutions to all REDD+ implementation challenges. REDD+ funding therefore needs to invest in the development of new institutions, benefit-distribution mechanisms and MRV mechanisms [78].

5.2. Cultural and Social Deterioration

In the previous sections, some potential impacts of REDD+ have been discussed, such as changes in land tenure, institutions, participation of local people in forest management, and livelihoods. All of these changes could contribute to cultural and social deterioration among indigenous and local communities. The institutional impact of REDD+ could, for example, cause a loss of traditional institutions in indigenous and local communities [35,38,44,77].

The commodification of nature has various implications on the way local communities perceive nature, interact with the natural environment and with each other as respective members of their communities. REDD+ facilitates market transactions based on a single exchange value, namely carbon credits [82]. This monetary fixation on nature fails to take social-cultural and ecological values of ecosystems into account, and it disregards its complexity. This could lead not only to environmental degradation (Section 6 Environmental Impact) but also to cultural and social deterioration of many indigenous and local communities who perceive forests in a holistic and complex way which go beyond carbon and monetary fixation [2,18]. This deterioration could be worsened by the new socio-economic hierarchies that will be created because of REDD+. This involves a re-positioning of existing actors, the emergence of other, sometimes more powerful, actors, and the restructuring of unequal power relations in access to wealth and natural resources [24,82].

6. Environmental Impact

This review mainly pays attention to the socio-economic aspects of the impact of REDD+ on local communities. However, from forest-dependent communities' point of view, it is also important to evaluate the impact of REDD+ on the direct natural environment. Not only is the natural environment closely intertwined with other aspects of communities' livelihoods and socio-cultural systems, but REDD+ could have both positive and negative impacts on forests and biodiversity. Therefore, what is the environmental scope of REDD+ and does REDD+ enhance or rather degrade biodiversity?

6.1. The Scope of REDD+

The scope of REDD+ remains a major challenge. It is unclear whether countries will receive carbon credits for: Avoiding leakage and future deforestation; avoided deforestation; forest conservation; or afforestation and reforestation. The ultimate decision will most probably be made by political factors and outcomes of COP meetings. Another challenge is whether countries will receive credits for output-based approaches or stock-based approaches. The former takes the changes in forest cover over a specific time period into account, while the latter considers the total forest cover [83]. This raises the challenge of additionality. Should communities be rewarded for continuing to conserve the forests or should communities be rewarded for not clearing the forests? Anderson [77] state:

> "*Crucial challenges in REDD+ policy design are to prevent deforestation without creating a perverse incentive to threaten forests and to reward successful forest stewards like indigenous peoples* (p. 22)."

Lang [84], for example, criticizes the government of Guyana, a country with a historically low deforestation rate, for threatening the international community to clear the forests if they don't receive REDD+ payments for their carbon stocks. Therefore, REDD+ could indirectly contribute to deforestation if it does not clarify its scope and approach.

6.2. Impacts on Biodiversity

As stated in Section 2 the UN-REDD Program and the FCPF, both UN-REDD and the FCPF acknowledge that REDD+ should not only reduce deforestation and forest degradation but also include biodiversity conservation and sustainable management of forests. Deforestation is one of the largest threats to global biodiversity, and the world's birds, mammals and amphibians [85]. REDD+ provides, therefore, many new opportunities to improve biodiversity [85,86]. Panfil and Harvey [86] evaluated 80 REDD+ projects across the world. All of these projects included biodiversity conservation goals and at least 15 of these projects already reported positive biodiversity outcomes. However, Panfil and Harvey [86] conclude that many of the projects' biodiversity goals lacked measurable and time-bound components. Projects often did not implement a clear monitoring component, and there were very often no clear guidelines on how biodiversity goals were expected to be implemented and/or achieved. Therefore, biodiversity objectives for REDD+ are more likely to be achieved if there is clear alignment among threats, goals, interventions and monitoring plans [85,86]. If there is no clear alignment, REDD+ could pose a risk to biodiversity and ecosystems.

REDD+ poses a risk to biodiversity in several ways. First of all, there could be a risk that, because of unclear forest definitions, forests are changing into monocultures or tree plantations that increase the carbon stocks at the expense of biodiversity and socio-cultural values [7,53,63]. Another risk is that there could be increased land-use pressure on carbon poor ecosystems outside REDD+ areas. While these eco-systems could have a high biodiversity or socio-cultural significance, there could be a risk that these systems will not be targeted by REDD+ because of the low carbon sequestration. REDD+ may actually threaten biodiversity in low-carbon density ecosystems if one only pays attention to carbon sequestration of forests [7,63].

There are many different definitions on what constitutes a "forest". COP19 states that each government is allowed to handle their own definition of "forest" in their national forest monitoring system. This provides a huge threat to biodiversity, since governments could include oil–palm and industrial tree plantations as "forest" [87]. Governments could therefore misuse the definition of forests, by introducing monoculture plantation, barren or shrub land as forests in order to reap the financial benefits of REDD+. Vanderhaegen et al. [88] furthermore argue that a whole landscape approach, also known as Reducing Emissions from All Land Uses (REALU), would be a more effective approach to REDD+ implementation. The authors argue that various areas classified as "non-forest" in Ethiopia, such as local agroforestry systems, grazing lands, and home-gardens, do not only store huge amounts of carbon but also contain significant biodiversity values.

7. Discussion and Conclusions

REDD+ has the potential to be the new environmental paradigm on nature conservation and livelihood development. However, it needs to clarify and deal with several issues which have been mentioned in this study and the rich literature on REDD+. One thing is certain, REDD+ cannot provide a blueprint or a one-size-fits-all model. It needs to be adapted to the national and local context of each country involved in REDD+ [7]. For each country and context, this will be a different task and challenge. REDD+, however, needs to incorporate several binding social, economic and ecological safeguards to prevent the potential harmful impacts on local communities and the environment. Besides dealing with leakage, permanence and additionality, it should also adopt, at least, a "do no harm" principle.

There are different opinions on whether REDD+ should contribute to poverty alleviation or not. However, most stakeholders and scholars acknowledge that REDD+ should at least "do no harm" to local forest-dependent communities. A guideline of "not doing harm" could be the United Nations Declaration of Indigenous Peoples from 2008. Article 26 of the United Nations Declaration of Indigenous Peoples [89], reads as:

"1. Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. [..] 2. Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired. [..] 3. States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned (p. 10)."

It is not only a moral obligation of the international community to adhere to this declaration, but excluding local people from REDD+ could also be both harmful to people's well-being and the environment. Table 1 provides a framework of REDD+ and indigenous and local peoples. This table is divided in the potential impacts of REDD+ on forest-dependent communities, the indicators, and potential solutions to prevent these impacts.

Table 1 allows us to answer the four research questions of this paper. Firstly, REDD+ could potentially exclude forest-dependent communities and recentralize forest governance. Furthermore, it could introduce new powerful actors, such as so-called "carbon cowboys" and other external private and political actors. It is therefore important that countries do not only show a willingness to actively involve local stakeholders, such as forest-dependent communities, through a nested approach, but that they will also have to outline clearly in their REDD+ readiness plans how they are going to do it. While UN-REDD and the FCPF stress that they respect countries' sovereignty, establishing binding policies and stronger social safeguards is crucial to ensure that forest-dependent communities retain control and decision-making power over their forests and livelihoods.

Secondly, REDD+ provides various opportunities for livelihoods, but it remains important that trade-offs are realistic, fair, equitable and include all segments of forest-dependent communities, especially poorer households. REDD+ will most likely not alleviate poverty, but it could be a useful tool for income diversification. Depending on the type of household, REDD+ could also offer various co-benefits, such as carbon rights, agricultural expansion, and forestland tenure. However, also here safeguards need to be implemented, which clearly define carbon ownership, tenure, benefit sharing mechanisms, and viable livelihood alternatives. Unclear definitions may rather harm than benefit forest-dependent communities' livelihoods.

Table 1. REDD+ and forest-dependent communities.

Dimension	How Could it Be Harmful?	Indicators	Possible Solutions
Institutional	Recentralization of forest governance; exclusion of local communities in forest management and decision-making; forest loss; global land grabs; loss of traditional institutions [7,16,21–24,29,38,44].	• Participation of local people. • Decision-making power and rulemaking. • Forest monitoring. • Forest governance structures. • Public and private stakeholders.	• Binding policies and guidelines on Free Prior and Informed Consent [38–43]. • Decentralization of forest management [17,28,33]. • Nested approach and stronger social safeguards [22,25]. • Community participatory carbon monitoring [34,59]. • Capacity building and strengthening of national and local institutions [16,21,35,78]. • Third party grievance mechanisms [21].
Forest governance			
Participation of local people			
Private stakeholders			
Livelihoods	Unequal distribution of income; people losing access to the forests; people losing forest tenure rights; people having less farmland; intra–and inter-community conflicts; REDD+ does not cover the opportunity costs; marginalization; discrepancies among definitions [8,11,26,35,45–49,51–55,59,60].	• Income sources and distribution. • Forest tenure and carbon rights and clarity. • Agricultural activities and physical environment. • Livelihood activities in forest.	• Comprehensive trade-off analysis of REDD+ implementation and a business-as-usual option of commodity production [8,26,48]. • Equal distribution of monetary and in-kind payments [47,49,50]. • REDD+ as a source of income diversification and not poverty alleviation [45,63]. • Securing and clarifying forest tenure and carbon rights [51–58]. • Sustainable alternatives to livelihood strategies [41,45,68].
Income			
Forest tenure Carbon rights			
Food security Co-benefits			
Socio–cultural	Loss of traditional or indigenous ecological knowledge; loss of forest management practices; commodification of nature [24,35,38,75–77,82].	• Traditional and indigenous forest practices. • Traditional and indigenous cultures and social lives. • Worldviews and values on ecosystems and nature. • Integration in the capitalist system.	• Community-based forest management [35,78–81]. • Inclusion of traditional and indigenous forest management practices in a REDD+ scheme [35,77,81]. • Consultation and participation of traditional institutions [2,35,44,51].
Traditional knowledge and practices			
Social and cultural deterioration			
Environmental	Introducing mono tree plantations and high-carbon production forests; more pressure on land outside REDD+ forests; threat to ecosystems with high biodiversity but low carbon sequestration [7,21,53,63,85,86].	• Definition of forests, deforestation and forest degradation. • Payments output– or stock–based. • Biodiversity hotspots.	• Clear definitions of forests, deforestation and forest degradation [7,53,63,87]. • Addressing the main drivers of deforestation [7,36,38]. • Quantifiable time-bound biodiversity goals [85,86]. • Detailed guidelines on forest monitoring [85,86]. • Biodiversity and livelihood fixation instead of carbon fixation [29,50]. • Sustainable alternatives to loss of agricultural land [45,63]. • REALU [88].
Biodiversity Scope of REDD+			

Thirdly, in terms of socio-cultural impact, multilateral agencies, NGOs, REDD+ and donor countries, and other stakeholders need to apprehend the holistic and intertwined relationship of forest-dependent communities with the surrounding natural environments. The monetarization and carbonization of nature have been proven to be harmful to indigenous and forest-dependent communities. Incorporating traditional forest management systems in REDD+ could actually create a win-win situation. Various studies have shown that sacred forests are well protected [3,18,35]. Incorporation of these traditionally classified forests could therefore greatly benefit a REDD+ scheme as well as local cultures, ways of life and beliefs. There are various other ways to include traditional forest management systems in REDD+, but it is very important for policy makers to realize that forest-dependent communities might not want to adopt the narrative that forests are just carbon containers. For example, during the FPIC process among communities in Vietnam, this depiction of forests caused a lot of confusion among local participants, who, rightly, did not understand why they were the ones to 'stop' global climate change [42].

Lastly, REDD+ needs to ensure that it does not threaten biodiversity. Some ecological significant places store relatively little carbon and monoculture plantations should preferably not be included in REDD+ programs. REDD+ needs to make sure that these low-carbon ecological hotspots remain protected and revalued through non-carbon credits. The Reducing Emissions from All Land Uses (REALU) approach as well as a biodiversity focus could ensure that REDD+ would not threaten low-carbon ecosystems or other non-forests of high ecological and carbon sequestration significance. However, REDD+ projects need to include quantifiable time-bound biodiversity goals, clearly address drivers of deforestation and forest degradation, and detailed guidelines on forest monitoring [86]. Therefore, both approaches and methodologies need to be reconstructed according to binding guidelines.

Many local and indigenous forest-dependent communities might wonder why they are forced to be involved in a climate change mitigation program, such as REDD+, if it are actually the industrialized countries that have caused global climate change [74]. While local and indigenous forest-dependent communities are most affected by climate change [4], the international community needs to integrate REDD+ into the local context, with local people being in charge of a local REDD+ scheme. This has often proven to be the most effective arrangement. Moreover, in no way should forest-dependent communities carry the huge burden of mitigating global climate change, while they have often been the ones who traditionally practiced low-carbon or "climate-friendly" livelihood activities.

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