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REDD+ at risk: Emerging ten questions that REDD+ must answer

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ABSTRACT

As an important initiative of climate action, REDD+ has been increasingly discussed in global policy arena. But delay in wider scale yet full-fledged implementation and its poor performance have raised suspects and pushed REDD+ toward in a long line of “conservation fad”. In this paper, we have discussed the following ten questions to REDD+: (1) Does REDD+ address major causes of deforestation? (2) Does REDD+ contribute to global emissions reduction? (3) Does REDD+ recognize the inherent capacity of local people to manage their forests? (4) Does REDD+ respect the rights of indigenous people and local communities? (5) Does REDD+ justify the local governance and countries’ sovereignty? (6) Does REDD+ ensure the transparency in program design and architecture? (7) Does REDD+ give credits to the carbon sequestering communities? (8) Does REDD+ supply sufficient reasons to justify the current carbon price? (9) Does REDD+ achieve climate goals through the voluntary carbon markets? and (10) Does REDD+ ensure sustainability of the ongoing projects? While discussing the questions, we have referred to global environmental issues of deforestation, emissions, transparency, decentralized governance, indigenous and local communities, voluntary carbon market, price effect, and other various contemporary sustainability issues. We argue that REDD+ could be a low-hanging fruit and act as a complimentary action to achieve its climate goal if it can address the issues raised under those ten questions.

1. Introduction

Being based on the objective of ‘forest preservation’ (Kyoto Protocol 1997) and concept of ‘compensated reduction’ (Conference of Parties–COP9 of UN Framework of Convention on Climate Change in 2003), REDD+ has set its objective framework of five core activities in COP13 (2007) to reduce deforestation and forest degradation, conservation and enhancement of forest carbon stock, and sustainable management of forests (Köhl et al., 2005; Wunder et al., 2020). In the last two decades, REDD+ has become a dominant policy paradigm in the global forestry sector which has been implemented by at least 60 developing countries until COP28, yet it has also been criticised as the rotten cake of endless climate discourse at the global scale, confused conservation priority at the national level, and obscure community engagement at the local level

(Cadman et al., 2016; Monjane et al., 2022; Sarmiento Barletti and Larson, 2017). Conservation giants at the global scale still believe, or pretend to believe, on REDD+ to solve the climate problems through performance-based mechanisms of carbon offsets to pay for conservation and enhancement of forests carbon in the developing nations (FFPRI, 2013; Gallo et al., 2020; Rey Christen et al., 2020). Since the beginning, it has been an open-secret fear that REDD+ can be a loophole to sustain big polluters by lingering the climate actions through the firewall of so-called ‘result-based aid’ (instead of clear-cut input-based program) and careful ‘recentralization’ of forest governance (Angelsen, 2017; Phelps et al., 2010). Besides, permanency, leakage and additionality are considered as the inherent problems of REDD+. Creating problem by one group of actors (industry groups) and finding solution from the other group of actors (forest dwellers) is the much-debated

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discourse under REDD+. Nevertheless, every year by the passing of annual COP meeting, REDD+ gets a renewed layer of silver-lining with a new hope of getting carbon and climate goals into action. Decision of adopting LEAF coalition (a private-public collaboration) as a complementary REDD+ program in the recent conference of parties of climate change is a noteworthy example (Chan et al., 2023). It has been a long way of inaction except the engagement of few environmental organizations in the name of organizing capacity building, producing policy documents, and carbon monitoring methodologies at (inter)national and local level. Now, it is the time to reflect on emerging questions that REDD+ must answer and clarify to break the stalemate of climate inactions, be it a go into action decision or an honest apology for policy falsification.

Multi-tier institutions and governing initiatives of REDD+ at multiple scales, developed in the last couple of decades, cannot be overlooked. For instance, cementing REDD+ through Cancun Safeguard Principles of REDD+ (2010), Warsaw Framework of REDD+ (2013), Paris Agreement (2015), and UN Sustainable Development Goals (2015–2030), internalization of result-based payments by several initiatives (to name a few, The World Bank's Forest Carbon Partnership Facility – FCPF, The Green Climate Fund's (GCF) Request for Proposals – RFP, and German Development Bank's Rewarding Early Movers – REM), and boarding of >140 countries towards net-zero emissions targets for different timelines can be considered as a substantial breakthrough in climate action through REDD+ mechanisms (Maniatis et al., 2019). The questions however remain on whether the global REDD+ giants are drowning into their own institutional interface of deliberately fancy climate propaganda, or they are going to kick-off the REDD+ into action the very next day. As Costanza et al. (2017) reported, there is no one right way to action but the wrong way is not to act. Reflecting on the deliberate uncertainty on REDD+ implementation, it justifies the claim made by Polasky et al. (2020) that the calls for further research are to delay actions and investment (behind the curtain) which has been practiced by donor countries, big polluters and a few civil society organizations by questioning the clarity of REDD+ action to oppose climate regulations or even challenging the REDD+ positive outcome. Termination of earlier REDD+ agreement by Indonesia and embarking a new climate deal with Norway to payback previous outstanding is the latest example (Hans, 2022).

Deadlock or delay of the REDD+ program, led by industry groups and donor countries, is not the whole story. The issues of inherent characteristics, target programs and objectives, adequacy of the intended activities, compliance of existing local values, and efficiency and sustainability of the program are also largely disputed. It will be too early to supply the rating on REDD+ now either as a success or a failure program yet discussing critical issues would shed light on scoping and processing of the program. In this regard, we intend to unmask the emerging issues of REDD+ that must be addressed and clarified. Deliberate invasion of overly technical and complex scene of REDD+ and hiding the process would not address the looming threat of climate change. Undertaking this kind of study is deemed urgent and important in the context where natural progression of REDD+ is being stagnated due to the fact that: (a) REDD+ participating countries are not at equal footing in term of their capacity for expediting REDD+ activities on the ground; (b) REDD+ policies and measures are being designed and implemented in ad hoc basis; (c) trust between REDD+ stakeholders, particularly REDD+ participating countries and donors is worsening; and so forth (Maraseni et al., 2020; Morita and Matsumoto, 2023). We wanted to summarize the key issues of REDD+ in 10 questions by covering the broader architecture of REDD+, including its governance, market, benefit-sharing mechanism, and sustainability. The unmasking of these issues will assist us not just to speed up REDD+ process on the ground but it may also provide a good lesson for recalibrating other result-based climate mitigation programs that are being implemented in different parts of the world. Our paper would help larger proportion of REDD+ stakeholders (including scientists, decision makers, climate

negotiators, and civil society actors) in understanding internal as well as external dynamics of REDD+ to solve carbon and climate problems, worldwide.

2. Review and validation approach

This paper is basically an argumentative policy discussion and a review on the international development discourse about REDD+. To construct the basic ideas of evolutionary and development processes of REDD+, we have preliminary reviewed literature about REDD+ programs that have been implemented in different parts of the world. After scrutinizing recent literature about REDD+, we identified and articulated various issues about REDD+. All the issues were then grouped into fifteen major questions covering REDD+ governance, marketing, benefit-sharing, and sustainability. Those fifteen questions were then discussed and validated in a regional level interaction workshop about REDD+ that was held in Bangkok, Thailand from 12 to 14 February 2023. The workshop consisted of a total of 65 participants from 12 different countries. Participants represented civil society organizations (n= 11), indigenous people's organization (n= 7), representatives from REDD+ project subgrantees (n= 8), regional REDD+ advisory and steering committees (n= 6), REDD+ focal points of the various countries (n= 5), national and regional non-governmental organizations (n= 16), academic institutions (n= 2), donor organizations (n= 4), and scholars and observers (n= 6). While finalizing the main questions, we firstly conducted individual discussion session with different stakeholders' group from different countries and request them to prioritize most important issues of REDD+ which were identified from preliminary literature review. After getting the most important REDD+ issues from each stakeholder group, the top ten REDD+ issues were discussed in detail among all stakeholders.

After sorting ten major questions from the workshop, we then again conducted literature review of the global context of REDD+, using keywords such as REDD+, emission, deforestation, carbon, indigenous people, and local communities so that we can discuss each issue thoroughly. We selected a number of literature under each thematic areas of those ten questions after which no new information was obtained to discuss about those questions. In addition to literature search on web-based database, we reviewed project documents about REDD+ from various countries and organizations including the publications from the World Bank- Forest Carbon Partnership Facility, UN-REDD+ program, Green Climate Fund, Intergovernmental Panel on Climate Change, various UN conventions, VERRA, voluntary carbon standards, and country reports of various REDD+ participating countries. Whatsoever, we do not claim the certainty over those ten questions and would not guarantee the success or failure of REDD+ based on those questions. Yet, we believe that those questions would guide the policy discussion forums at local, national, or international level to have a solution-oriented approach to REDD+ rather than jingling REDD+ conspiracy and/or bureaucracy.

3. Qn. #1: Does REDD+ address major causes of deforestation?

Reducing tropical deforestation was one of the core objectives of REDD+, which was also considered as a cost-effective approach of climate actions (DeFries et al., 2010). Some research show that REDD+ has reduced deforestation (Jayachandran et al., 2017; Simonet et al., 2019), for example a report by EDF (2016) claimed that in the period of 2006–2016, Brazil reduced emissions from deforestation equivalent to a year's emission from entire European Union because of the right incentive mechanisms. Yet, others claim that the impact of REDD+ in reducing forest loss however is very minimal and it couldn't reduce the net forest loss (Bos et al., 2017; Guizar-Coutiño et al., 2022). To illustrate, net forest loss during the period of 2010–2020 was 4.7 million ha (Mha) per year (FAO, 2020). Since 1990, >400 Mha of global forest has been reportedly lost due to deforestation (FAO, 2020). Commodity

driven deforestation has been increasing from 2000, being the highest in 2018–2020 (Forest Declaration Assessment Partners, 2022). For example, Brazil has witnessed 3% rise in the rate of deforestation in 2021 compared to 2010 (Gilbert, 2022). Despite being the highest recipient of REDD+ (i.e., 31% of the total REDD+ fund), Brazil lost 62.8 Mha of tree cover in 20 years period from 2001 to 2021 (GFW, 2023). In 2021 alone it lost 2.98 Mha of forests out of which 2 Mha was commodity driven, mostly due to surging demand of beef and soyabean in Europe and China (GFW, 2023). Numerous factors are attributed to the causes of deforestation. Major drivers of deforestation and forest degradation are conversion of forests in croplands and unplanned infrastructure development. Among the others, DeFries et al. (2010) have outlined urban population and agriculture export are positively associated with deforestation, which has nothing (or very less) to do with rural population. Besides, Neef (2020) claimed that >50% of land acquisitions contribute to deforestation. Global cropland area was increased by 110% in the last one and half century (1950–2015) (Houghton and Nassikas, 2017). Agriculture accounts for >70% of the prevalent drivers of deforestation, 40% of which only from the commercial agriculture (Hosonuma et al., 2012). Moreover, FAO (2009) estimated an increase in food production by about 70% until 2050 to feed the growing population. Although 70% of the required food is estimated to be produced through agricultural intensification, the remaining 30% would require extensification (i.e., land use conversion from forest to cropland). In this regard, the question comes how forest ‘centric’ interventions from REDD+ would reverse the scariest momentum of deforestation, caused by the industry-scale drivers of land use change.

It has been an intrinsic problem of many environmental initiatives that they ignore investment in agriculture system to improve crop production and productivity (Foley et al., 2011). In this regard, Dickey Zakaib (2011) suggested that REDD+ needs to mainstream the innovation, investment and implementation in non-forested land, particularly in agricultural lands to improve crop yield as well as to deal with the potential leakage problem in REDD+ implementation. Although it may not be feasible to bring all land use systems in REDD+ framework, it would be necessary to acknowledge and bring on board the land use types which are linked with and affect emissions. Further, DeFries et al. (2010) insisted to focus on industry groups and agriculture based export of commodities to address the drivers of deforestation. But the current strategies of REDD+ are insufficient to answer the feedback mechanisms of global telecoupling effects of agriculture, including increasing demand of commodities in wealthy nations, and supply chain of carbon emission (including that from deforestation). Rather, it has been sinking into the tiny details of rural land use practices, silvicultural fantasy of natural forests in the tropics, and bureaucratic transactions of the REDD+ design (including safeguards and monitoring). Perhaps, a recent report by Forest Declaration Assessment Partners (2022) would be straight forward to understand that a dozen of countries have overwhelmingly prioritized REDD+ in their forest strategies but failed to lower the rate of deforestation. Being late otherwise, it is the time for REDD+ to visualise the broader spectrum of the drivers of deforestation beyond forest ‘centric’ but considering dynamics of land use practices, integrated land use planning, efficiency of farming system, and supply chain of forest and agricultural commodities.

4. Qn. #2: Does REDD+ contribute to global emissions reduction?

Since the mid-19th century, about 2500 bn tonnes of CO₂ have been estimated to be released in the atmosphere due to human activities, out of which >80% is from fossil fuel (Friedlingstein et al., 2020). Fossil CO₂ emissions have been increasing at an alarming rate (i.e., average annual emissions of 3.0 ± 0.2 GtCO₂ in the decade of 1960 s to 9.4 ± 0.5 GtCO₂ in 2010–2019), the emission from land use change and forestry however has remained unchanged in the last half century (Friedlingstein et al.,

2020). Another estimate by Evans (2021) claimed that emissions from land use and forestry increased only from 3GtCO₂ to 6GtCO₂ over the period of 1850–2021 whereas the fossil-fuel emissions have increased by 185 times (i.e., from 0.2GtCO₂ to 37GtCO₂) for the same period of time. Over the period of 1850–2015, the contribution of deforestation to the total net emission was increased only by 11%, > two-thirds being the crops, followed by pasture land use (Houghton and Nassikas, 2017). In this context, putting fossil fuel emission and commercial farming in shadow on one hand, and exemplifying forestry practices as the villain of global emission on the other is a controversial argument under REDD discourse.

One can wonder, are we providing licence to the super polluter to continue their emission in the name of carbon offsets? A study (Grant et al., 2021) found that switching of super polluters (i.e., top 5% of hyper-emitting power plants) from coal/oil to natural gas would cut one-thirds and the adoption of carbon-capture technologies might reduce the global emissions by half. In this regard, instead of speeding the adoption of green technology, continuation of business-as-usual below the blanket of carbon offsets (emission in one place can be corrected by restoring carbon in other places) might ease the industry groups to continue their emissions (Monjane et al., 2022). Inherent characteristics of REDD+, in this regard, is not an optimistic idea to reduce emissions, but just to hold the global emission at the existing level even in the best-case scenario. An IPCC report also claimed that the REDD+ initiative has not been proven as an effective measure in climate mitigation (IPCC, 2019). Moreover, REDD+ can also be misused to bid an auction for increasing emissions with the high-hanging fruit of carbon offsets. So, REDD+ will have no excuse by labelling as a virtual license to polluters but should be considered as a complementary initiative of carbon sequestration which can add to the collective efforts of emission reduction by super polluters.

5. Qn. #3: Does REDD+ recognize the inherent capacity of local people to manage their forests?

Over 70% of the global forests (2.93 billion ha) are secondary forests, out of which only less than 10% are the plantation forests (FAO, 2020), rest of them being managed but not at the industrial scale. It implies that much larger proportion of the global forests are proximate to and/or managed by small scale farmers and local people. Nearly a quarter of global land area is occupied by indigenous people and local communities (IPLC) (Garnett et al., 2018), and over one-fifth of the tropical forests are directly managed by IPLC (Popkin, 2015). Likewise, more than half a billion people are engaged in community based forest resource management (Aryal et al., 2019; Baynes et al., 2015). In this regard, IPLC are the keys to the success of REDD+ (Poudyal et al., 2020; Weeks and Filardi, 2011), not only in terms of their proximate share of forest resources but also in terms of their capacity, confidence and stewardship over forest management (Aryal et al., 2023). IPLC know the general characteristics, ecology, and usage of most of the forest types and they are the best manager, guardians, and solution makers not the outsiders (Laudari et al., 2020; Laudari et al., 2022; Laudari et al., 2024). There has been a growing need of IPLC to upscale and out-scale their capacity of forest management (Garnett et al., 2018), but REDD+ is blamed as an expert-oriented global project which consider academic elites and large NGOs workers as the masters of forest management practices.

A handful number of ecologists cannot prescribe for the sustainable management of global forest area (4.04 billion ha). Scientists who are living in downtown or CBD (central business district) area do not necessarily know how to live with man-eater tigers or crop-raiding elephants or livestock-depredation leopards which has been a normal phenomenon to IPLC in their immediate surroundings for centuries. Therefore, indigenous knowledge of IPLC that have been tested for generations and developed as a harmony with forests and nature, such as ‘traditional ecological knowledge’ (Schroeder and González, 2019),

should not be ignored while characterizing forest management practices under REDD+. In the name of performance-based mechanism, REDD+ demands additional interventions to the pre-existing harmony between forest and people, which basically means local people's practices are not sufficient in terms of carbon conservation and enhancement. Alternatively, REDD+ is trying to inject 'carbon forestry' in multifunctional landscapes where IPLC have restored and managed critical ecosystems, satisfying biodiversity conservation and livelihood connections (Ojha et al., 2019). In this regard, so-called conservation giants at the global scale should stop stating inundation of sophisticated forest management prescriptions, rather consider uptake of the indigenous knowledge that has been successful in maintaining integrity of forest health and people's wellbeing. Or else, assurance of 'management authorship' (Aryal et al., 2023) of the IPLC for managing community based forest resources can be done by integrating (but not injecting) science into indigenous knowledge.

6. Qn. #4: Does REDD+ respect the rights of IPLC?

More than half of the tropical forests falls under the historical territories of IPLC, and about one-fourth of the total carbon stored in the tropical forests and over 80% of terrestrial biodiversity have been managed by IPLC (RRI Partners, 2016; Sarmiento Barletti and Larson, 2017). There has been an avalanche of research and advocacy for the rights of IPLC since 1990 s, not only for the REDD+ but also for other natural resource management paradigms, most of them however seemed to be lip service rather than embracing the traditional rights of IPLC. Although REDD+ discourse emphasize land use rights of IPLC and it has been central to UN Declaration on the Rights of Indigenous Peoples (2007), Indigenous and Tribal Peoples Convention, 1989 (ILO 169), and Asia Indigenous Peoples Pact (1992) significant gap exists between provisioning (in paper) and implementation (in practice) of REDD+ (Sarmiento Barletti and Larson, 2017). Social safeguard has been considered as an important component of the REDD+, for instance FCPF has claimed to adapt safeguard measures for the inclusion of IPLC, but what is the point if it does not consider the historical contribution of IPLC – as an additionality in carbon sequestration– while conserving and living with the forests. In this regard, Cook-Patton et al. (2021) also fear that IPLC might be excluded from the incentive mechanisms of REDD+ if their historical contribution is not considered additional. Besides, some authors believe that those safeguards are less effective in protecting the rights of IPLC but are adding more burdens of the transaction costs (UNEP, 2022; Maraseni et al., 2014). For instance, FCPF has adopted a guiding principle that require addressing safeguards measures of both the World Bank and UNFCCC, which is additional burden. Moreover, GCF requires countries to meet three different sets of safeguard measures including those of GCF, UNFCCC, and that of the 'accredited entity'. Due to the reasons, safeguard measures in many cases are portrayed just as burdens to the target communities rather than safeguarding IPLC. On the other hand, many countries with high-forest low-deforestation (including Panama, Surinam, PNG, Columbia and others), which share 18% of the tropical forests (Fonseca et al., 2007), are treated unfair in the REDD+ initiatives.

'Rights' might be not that simple to uniformly interpret; however, REDD+ is in one way or the other tend to compromise traditional authority and indigenous practices of IPLC for the management of forests of their vicinity (Poudyal et al., 2020). Ignorance of the historical contributions, potential elites' capture over the transactions of REDD+ mechanisms, blueprint management prescriptions through so-called 'standards' developed by the donors (or donor boosted organizations), and global governance of local resources have led sufficient reasons to doubt on the rights of IPLC. Because of fear and threat of losing land use right, group of IPLC in Panama, who had the control over 7% of primary forests, banned REDD+ project (Potvin and Mateo-Vega, 2013). In this regard, REDD+ should be able to clarify that it is not a safeguard-coated outside but colonial hangover inside of the emission giants from

developed nations. By any means, REDD+ should be designed in such a way that can reinforce the rights but not overtake the historical entitlement of IPLC.

7. Qn. #5: Does REDD+ justify the local governance and countries' sovereignty?

Decentralized management of natural resources has gained momentum after the 1970 s, which has been claimed as a successful approach in sustaining forest resources while securing the rights and assigning the responsibilities to IPLC (Balooni and Inoue, 2007; Oldekop et al., 2019). About 13% of the global forest area is legally managed by IPLC (RRI, 2018). In the developing countries, which were the target of REDD+ program, 22% of forests used to be managed by IPLC which was increased to 31% in 2017 (Maraseni et al., 2020; RRI, 2018). Realising the knowledge and skills of IPLC, developing nations were decentralising their powers to IPLC but suddenly this REDD+ came and trying to centralise natural resources. Monjane et al. (2022) believe that REDD+ might be reflected as a new form of recentralization and colonisation. Any form of recentralization is prone to trample the land use rights of the IPLC. Besides, recentralized governance to stop deforestation might further exacerbate local and global inequalities (Gilbert, 2022). In this scenario, globalization of various environmental governance mechanisms has augmented the issues of equity and justice to decentralized governments and IPLC with differing socio-economic characteristics and financial capacities (Schroeder and McDermott, 2014), REDD+ is not an exception. Although REDD+ has aimed to strengthen local democracy, it has not involved local authority in REDD+ consultation so far, as evident from the case of West Africa (Asiyani et al., 2017; Nuesiri, 2016), South Asia, and South East Asia (Maraseni et al., 2020; Poudyal et al., 2020).

While the REDD+ is being blamed for recentralizing forest governance through monetizing carbon and incentivising central government's control over forest resources (Phelps et al., 2010), the fairy-tale of the REDD+ might not end here. It might further lead to one institution at the global scale, crafted and delivered by a handful of economic elites, disrupting local governance and challenging countries sovereignty over forest resources. The rise of REDD+ institutions to operationalize the REDD+ mandate is being perceived not just as a threat undermining state's power and sovereignty for managing its forest resources (Hermawan et al., 2023) but also it has opened a new battlefield for inter-agency power rivalry over formal mandates and budgets (Wibowo and Giessen, 2015), which is being observed in Indonesia in recent years. Similarly, 'carbon trap' could become a powerful tool to rival the debate over decentralized governance (Ojha et al., 2019). It is a good indication of collaboration for carbon funding that 17 donors have made contributions and commitments of USD 1.3 billion through FCPF (The World Bank, 2022), but, to an extreme, one could claim that FCPF has influenced (if not, has guided) forest management models through its own standards and/or safeguards mechanisms in 47 developing countries with the carbon fund. Moreover, public finance management system of REDD+ participating countries is also being challenged by FCPF's separate financial system, which barely recognize participating countries financial management, auditing, and procurement procedures. Inclusion of other REDD+ funding sources (i.e., UN-REDD and Forest Investment Program-FIP) would further increase the amount of REDD+ funding for developing nations (GCF, 2019). These are merely a few examples of how governance mechanisms and sovereignty in many countries are being challenged from REDD+ governance. Centralized governance, mostly led by international conservation organizations, in developing nations might weakens community leadership and engagement of marginal groups in decision making (Aryal et al., 2021; Edwards et al., 2021). Choice of the participating developing countries (mostly, central governments) through their Nationally Determined Contributions – NDCs would be one thing (Laudari et al., 2021). But, in any case, if the program fails or terminates without an intended results who takes

the responsibilities, central governments or the global partners? In the past few decades, the REDD+ initiative has brought various changes, such as new forest policies, rules and regulations, the creation of REDD+ working groups and institutions at both national and local levels, and the investment of billions of man-hours. Socio-economic impacts of those changes are readily measurable at various sectors and levels, who bear the cost of chaos in this fuzzy pathway of REDD+ as this is non-reversible. It is easy to start a campaign but difficult to conclude, and REDD+ should be clear in that respect that it would not compromise the essence of decentralized governance in any way to be free from the blame of the tomorrow's worse-case scenarios.

8. Qn. #6: Does REDD+ ensure the transparency in program design and architecture?

Transparency is one of the much-debated elements of REDD+ (Cadman et al., 2019; Gupta and Mason, 2014), but in terms of its technical measures (i.e., measuring, reporting and verification – MRV systems), not in terms of its design and implementation. An interface of MRV systems in REDD+, which is a technical as well as bureaucratic expression of carbon transaction, might be just a tip of the iceberg regarding the issues of transparency. Crux remained at the transparency that must be ascertained while making policy decisions, trustworthy commitments, and strict deadlines in the international forums. Deliberate delays and lack of clear deadlines are understandable transparency problem at the global scale, whereas lack of transparency during the formulation of REDD+ working group at the local and (sub-) national level are some of the examples about how REDD+ program has not been clearly informed among all the concerned stakeholders' group (Awono et al., 2014; Awung and Marchant, 2020; Monjane et al., 2022). Moreover, breach of transparency can be observed while selecting program areas with high level of deforestation and forest degradation, especially when working at the sub-national level. For example, in Indonesia and Laos, over 1 Mha and 0.8 Mha of forest area, respectively, were considered lost during the baseline periods of FCPF Emissions Reduction Programs (FCPF, 2018, 2019), for which some believe that it was not transparent and there was a vested interest in selecting those sites and baseline rate of forest loss. While at the same time, critiques of voluntary REDD+ projects have consistently raised concerns that deforestation baselines are highly likely to be intentionally inflated by “carbon cowboy” seeking to receiving financial benefit from the commercialization of superfluous credits, or “hot air” (Mertz et al., 2018; Rifai et al., 2015; Seyller et al., 2016).

Some scholars believe that REDD+ hide more and reveal less. To illustrate, Ordonio (2018) reported that lack of transparency and accountability are the reasons behind failure of REDD+ in Peru. Likewise, inclusiveness and transparency in decision making have been considered crucial aspects in REDD+ in Nepal and Papua New Guinea (Cadman et al., 2017). In many countries, REDD+ benefit sharing plans are (intentionally) complex, so many of the stakeholders do not understand it because it is not being discussed among all the concerned stakeholders and rightsholders (Poudyal et al., 2020; Wong et al., 2019). Lack of transparency at the national and local level might prompt (or at least continue) financial irregularities in REDD+ implementation, as shown in pilot sites of Philippines (Mayo-Anda and Torres, 2014). Lack of transparency might exacerbate elites capture and create conflicts among the REDD+ participating communities (Monjane et al., 2022). In this regard, transparency at all levels of decision making for REDD+ should not be compromised to ensure equity and justice over tenure security and benefit sharing (Isyaku et al., 2017). Although there has been few discussion about transparency through REDD+ safeguards, MRV, and free, prior, and informed consent (Bumpus et al., 2019; Voigt and Ferreira, 2015), the issue of transparency at the global scale while making REDD+ commitments and contributions must be ascertained to onboard all the relevant stakeholders and make a joint effort to create synergies in REDD+ implementation outcomes.

9. Qn. #7: Does REDD+ give credits to the carbon sequestering communities?

REDD+ is a multi-disciplinary program, involving diverse activities (both carbon and non-carbon) and integrated approach of institutional interventions at all levels of planning, monitoring and incentivizing (Duchelle et al., 2018). In this regard, no doubt, it asks for multi-stakeholders' institution and interventions. Role of developing countries, donor countries, market actors, and facilitators all need to play a vital role to succeed REDD+ but do they all get the justifiable credits to their efforts in doing so. Further, there might be multi-tiers of actors' coalition and constellation at national, sub-national, and local level, is there any mechanism to ensure that their contribution is well recognized in a rational order? There is no certainty on ‘who owns REDD+’ (Streck, 2020). In addition to incentives and/or compensation, reward, recognition and stewardship plays decisive role in continuing actors' and organizations' effort in collective action in environmental sector (Aryal et al., 2023; Swallow et al., 2009). The dominance of market actors and facilitators in REDD+ discourse, so far, has put enough space to doubt that IPLC might not be getting just credits to REDD+ implementation.

While planning for REDD+, we should not forget that land use problem (including emissions) is a local problem, which can only be solved when the IPLC are willing to and ready to act upon it (Dawson et al., 2021). But, most often we see central governments, or even civil society actors have been claiming the success, if any, of environmental management program (including REDD+ pilot project) to their own. Donors and emission giants could represent themselves as the heroes of the REDD+, even if they continue the emissions, with the blade of ‘carbon offset’. Moreover, elites from civil society and non-governmental organizations might celebrate the victory as of their own. But the IPLC might not be acknowledged for just credit and proper stewardship for their efforts, even they might have compromised their existing livelihood connections with forest resources and worked hard to capture carbon from the atmosphere (Poudyal et al., 2020). Although collaborative action is the foundation of REDD+ program, it must clarify that carbon sequestration should be accredited to the IPLC in forested landscapes not to the civil society elites and donors who are based in urban downtown and barely know about IPLC's historical contribution to forest resource management at the expense of their livelihoods.

10. Qn. #8: Does REDD+ supply sufficient reasons to justify the current carbon price?

There is a huge gap between the current carbon price and the price needed to successfully implement REDD+ programs. A study by Pukkala (2020) found that payment of about 150 €/tCO₂ would be required to abate all cutting of trees in Finland. Otherwise, 50 €/tCO₂ would increase carbon sequestration by only 50% and 100 €/tCO₂ is needed to increase that by 70%. Likewise, marginal abatement cost of industry units for carbon capture, transport, and storage ranges between 80 and 135 €/tCO₂ (Johnsson et al., 2020). Even in the enabling policy scenarios, High-Level Commission on Carbon Prices (2017) concluded the need of US\$ 50–100/tCO₂ by 2030 to achieve the Paris agreement. But, the current carbon prices (US\$ 5–10/tCO₂), as allocated in REDD+ projects, is very much lower than the so-called market price of carbon (Köhl et al., 2020; Ramstein et al., 2019). Besides, 10–40% of the emission reductions would not be counted so as to buffer uncertainty and risk reversal (FCPF, 2022). Martin et al. (2021) blame for political and economic reasons to remain the low price of carbon. Whatsoever, this huge gap between current carbon price and carbon abatement costs might reflect the lack of transparency and commitment dilemmas of donors in REDD+ design and implementation.

REDD+ implementation activities is believed to incur transaction costs in addition to implementation and opportunity costs. Current state of REDD+ initiatives barely meets the implementation costs – the basic costs – that is required to duly commence carbon sequestration

measures in the field (Luttrell et al., 2018). Transaction costs—for establishing and operating a REDD+ programme, the application of safeguards accounts and preparing technical annex—is a major cost and it has been steadily on the rise, as countries are facing increasing number additional carbon, legal and safeguards requirements in order to access REDD+ payments (Nantongo and Vatn, 2019). Also, the control over transaction costs is far from the resource poor communities but in the capture of powerful international organizations (Gallemore et al., 2015). Moreover, opportunity cost of REDD+ is another crucial aspect. In a study by Rakatama et al. (2017), opportunity costs of REDD+ was found to be more than three folds of the total of implementation and transaction costs, and the total costs of REDD+ was believed to be higher than twice the opportunity costs. While summarizing all those costs, how current carbon price of US\$ 5–10/tCO₂e justify the appropriateness of ‘payment’ in REDD+ mechanism? Is this a mere illusion of avoiding carbon abatement costs by the industry groups by playing a fixed win-lose game to the forest dependent poor communities of the world? REDD+ program will have no excuses to be reported as a failure conservation initiative in the history, which must be sorted out as early as possible by reducing the price gap by considering all the associated costs for generating REDD+ carbon credits, including but not limited to, implementation and transaction cost. Revisiting the current carbon price will not just provide justice to the efforts of REDD+ participating countries and IPLC in conserving forests, but it may also reduce the potential risk of using relatively cheap forest carbon credits by fossil fuel giants as a means to circumvent urgently-needed transitions to low carbon economies (May et al., 2011).

11. Qn. #9: Does REDD+ achieve climate goals through the voluntary carbon markets?

The ‘net-zero’ emissions jargon is becoming a popular discourse in climate action in the recent years (Bayon et al., 2009; Kotsialou et al., 2022). A good perspective of the ‘voluntary’ momentum is that it has been liked by biggest polluters (including from USA, EU and China), covering over three fourth of the global emissions with the participation of over 70 countries (United Nations, 2023). Accordingly, thousands of business institutions and hundreds of financial institutions, and over 1000 cities have joined hands to a global effort to reach net zero emissions (United Nations, 2023). For instance, *The Science Based Targets initiative* (2022) has reported over 1660 net-zero commitments. Another report about climate talk in COP27 has mentioned that over 12000 businesses are reported to set net-zero target (*The Economist Newspaper Limited*, 2022). Voluntary carbon markets has crossed over US\$ 2 billion transaction (*Forest Trends Association*, 2022); out of which about 75% of the credits have come from REDD+ (Granziera et al., 2022). Complementary carbon sequestration initiatives would be beneficial for the climate action; however, there are no globally agreed rules, oversight organizations, and governing mechanisms for that voluntary market (Gillenwater et al., 2007; Granziera et al., 2022). In this regard, voluntary market might give excuses to the big polluters for not involving in the globally agreed REDD+ framework, rather it might escalate greenwashing for mining and oil companies, business entities, and financial institutions.

Researchers think of a danger of voluntary carbon market becoming just a propaganda (but not an action for change) and company greenwashing for emission business-as-usual (Gürçam, 2022; Streck, 2021; Whittington, 2016). It is because, the voluntary carbon market is largely non-transparent, and companies will continue mining and consumption of oil and gas. Because of the purposeful flexibility to the emitters and lack of globally agreed rules and oversight agencies, REDD+ might be superseded by the voluntary mechanism (i.e., non-permanent nature of carbon sequestration). For example, a study into Verra, who managed the world’s leading voluntary carbon markets program, has found that over 90% of rainforest offset credits are likely to be ‘phantom credits’ (Greenfield, 2023), which has been adopted by big corporations

including Disney, Gucci and Shell. In one way or the other, temporary and patchy voluntary markets can also be frustratingly used to further delay the solid framework of REDD+ for nature sustainability (Streck, 2012). Those temporary measures can be taken as a complement but not an alternative to achieve the ambitious emission reduction targets (Matthews et al., 2022). To this end, implementation framework of REDD+ should be clear enough to either bring the growing number of companies and industry groups who are committing ‘net-zero’ or set back flourishing unsustainable and un-regulated carbon markets, allowing more company greenwashing. By now, it is enough lingering of REDD+ by being in the grey zone for the couple of decades, so REDD+ should answer that whether it is heading to speedy attainment of climate goals that were set in the Paris Agreement or apologize for the unsuccessful attempts.

12. Qn. #10: Does REDD+ ensure sustainability of the ongoing projects?

REDD+ is not a panacea for nature sustainability. But it is just, by its modus operandi, an initiative for sequestering carbon from the atmosphere albeit it has also a greater potential to provide various non-carbon benefits. It has centred all the land use problems to carbon and climate actions, which basically means a fair carbon trade between big polluters and carbon sequestering communities can solve the global problems. Nevertheless, established institutions for conservation and development, indigenous knowledge and traditional practices, interdependencies of nature and society, good practices and successful local stories, and many other social and ecological systems which are very important for sustainable forest governance are under the shadow of climate discourse. Further, REDD+ is believed to compromise crucial aspects resource management, such as, decentralized governance, unique indigenous practices, and traditional success stories of forest and natural resources management. Some of the prescriptions for REDD+ implementation are against the local norms and values, and REDD+ has introduced conflict in the communities (Monjane et al., 2022; Patel et al., 2013). Moreover, REDD+ has further disadvantaged socio-politically weak people as compared to the social elites, in terms of getting compensation, as observed in Madagascar (Poudyal et al., 2016). Furthermore, Bayrak et al. (2014) reported that REDD+ put the food security and livelihood support systems of many villagers at risk in Vietnam. Sustainability of the program depends on the positive discrimination, inclusion, and participation of forest dependent poor people. Likewise, command and control approach to conservation is not adequate to sustain tropical forests (Rosa da Conceição et al., 2018), but REDD+ program should be considerate of the place based values, social and economic contexts, and institutional constraints of the locality. In the name of climate actions, REDD+ should not be given the superpower to overrule the existing social norms and values, institutional arrangements, and local initiatives for conservation and development.

Besides, REDD+ might soon be facing a sustainability problem within itself. It is because, many REDD+ pilot projects that are being implemented worldwide are about to terminate soon. Amongst others, REDD+ has introduced the concept of benefit sharing for the conservation and retention of forest carbon. Once local people are paid for their action (i.e., benefit sharing in REDD+ pilot projects), voluntary community efforts for forest conservation might be crowd out (Fisher, 2012; Gómez-Baggethun et al., 2010; Maraseni and Hanjra, 2013). In addition, it is very unlikely that local people take action to generate non-local ecosystem services (i.e., carbon and climate action) (Aryal et al., 2022; Pandey et al., 2023). When the pilot projects terminate with no solid exit plans, then there could be even worse situation than before, which needs further exploration. Since lessons from the terminated REDD+ projects will provide insights about whether the past REDD+ activities maintain the permanence of avoiding deforestation, which is one of the prime goals of REDD+ (Carrilho et al., 2022). Because some scientists doubt that REDD+ can be one of the ‘conservation fads’

(Fletcher et al., 2016), which can come to an abrupt end as ‘a patchwork of projects’ (Turnhout et al., 2017). If such happens, multi-fold ripple effects of REDD+ might disturb national policies, organizational set-up and reforms at national and subnational level, social structures, and grossly the community expectations. There is not an easy escape from REDD+; however, it should be clear enough to sustain (or at least no to degrade) existing successful local institutional arrangements and enabling national policies for nature sustainability.

13. Conclusions

Our review shows that REDD+ has not yielded any notable outcome despite investing two decades and billions of dollars. It was not sighted that REDD+ could be moulded in such a way that it has neither an easy start nor the dead end. While until some scholars and institutions carry the hope of REDD+, we discussed emerging issues of it in this paper which can be helpful in shaping the ways forward. Having discussed the emerging issues, we neither advocate that REDD+ would be instrumental in emission reduction nor we claim that REDD+ is not important in carbon sequestration. In this paper, we want to dig dip the REDD+ associated issues which needs to be informed to the wider audience, including decision makers, climate negotiators, scholars, and civil society actors. REDD+ is found to be confined only to the forestry discipline which is not adequate to reverse the trend of deforestation, and now it is time to think of carbon actions in other land use to achieve the real outcomes of climate action. REDD+ is in danger of being (mis)used to abandon emission cut by industry groups in the name of carbon offsets. In this regard, we argue that REDD+ initiatives by any means should not be compromised with the dedicated emission reduction targets of super polluters.

Recognition of historical entitlements and contributions of indigenous people and local communities in current REDD+ instruments are not adequate. We therefore urge for upscaling and mainstreaming of local forestry practices, assurance of management authorship of natural resource management, and acknowledgement of traditional right over resources. Besides, to overcome the critics of recentralization, we recommend that REDD+ should be flexible in program design and implementation in a way that can incorporate place-based values of local forestry and essence of the decentralized governance. Likewise, in addition to issuing numerous policy documents (i.e., safeguards and standards), onboarding of all the relevant stakeholders and transparent dialogue speed up the translation of REDD+ commitment into implementation outcomes is equally important. Determination of justifiable carbon price, proper regulation of voluntary carbon markets, and sustainability of the ongoing projects are the other major elements that REDD+ must answer on its way to global climate actions. As no conservation campaign is free of challenges, REDD+ holds greater potential to be a powerful global initiative if it can adequately address the emerging issues of nature, climate, and society.

CRedit authorship contribution statement

Kishor Aryal: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Tek Maraseni:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization. **Bhishma Prasad Subedi:** Writing – review & editing, Supervision, Resources, Project administration. **Hari Krishna Laudari:** Writing – review & editing, Methodology. **Puspa Lal Ghimire:** Writing – review & editing, Resources. **Sudarshan Khanal:** Writing – review & editing, Project administration. **Han Zhang:** Writing – review & editing, Supervision. **Ramesh Timilsina:** Resources, Project administration.

Declaration of Competing Interest

All authors declare no conflict of interest.

Data availability

No data was used for the research described in the article.

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