Some issues in climate change, tropical deforestation and land use.

A survey by Mike Speirs (independent researcher)

*** draft, 21st June 2023 ***

1. Introduction – high stakes in forests

It is increasingly recognised that conservation and restoration of tropical forests and landscapes are essential components of scaled up efforts to tackle global warming and to preserve and enhance the biological diversity of the planet. Some alarming analyses indicate that continued deforestation is likely to result in a "mid-century tipping point" in the Amazon and elsewhere, with a high risk that rainforests will "dieback" and disappear through conversion to drier savannah landscapes. This could have significant impact on local and global ecosystems, on food systems and weather patterns, inter alia through disrupted water cycles, as well as on species distribution (rates of extinction).[1]

This paper provides a brief survey of international initiatives undertaken in the last couple of decades to halt and reverse deforestation and forest degradation. The crises caused by natural resource mis-management and increased greenhouse gas (GHG) emissions from tropical forests have culminated in calls for governments and international organisations to devise and introduce "nature based solutions" (NbS).[2] In particular, the dynamics of land use change and resource management in and around tropical forests highlight the need to understand the roles and strengthen the rights and responsibilities of a wide range of land use stakeholders, notably indigenous people and local communities (IPLC).

Put bluntly in United Nations terminology, the ambitions, targets and mechanisms defined in the climate change and biodiversity conventions – dating back to the Rio Earth Summit in 1992 - are confronted with recurrent concerns about "implementation." Obviously, an objective in a declaration of intent has to be translated into policies, measures and actions on the ground that lead to the desired outcomes. Confronting the multiple "drivers" of deforestation and degradation – notably land use change for crop cultivation and livestock ranching as well as for mining and infrastructure - is the key to stopping forests having a higher value cut down than standing.

---

[1] *A feedback mechanism is emerging: global warming exacerbates deforestation through biodiversity loss, forest fires, biomass loss and erratic precipitation, which leads to more greenhouse gas emissions and further climate change. Evidence is in reports by the IPCC (2023) and in investigations by Boulton et al (2022), Lawrence et al (2022) and Smith et al (2023). Caldecott (2022) uses evidence gathered during an evaluation of Danish mitigation funding in developing countries (Danida, 2021) to make the case for speeding up and prioritising mitigation efforts, focusing on ecosystem protection.*

[2] *According to the IUCN, NbS can be defined as "actions to protect, manage and restore natural or modified ecosystems that address societal challenges (such as climate change, food and water security, natural disasters) effectively and adaptively, simultaneously providing human well-being and biodiversity benefits." See, inter alia: Girardin et al (2021) and UNDP (2022).*

An associated issue is the question of finance, since it is also recognised that halting deforestation and land degradation is a costly business.[3] In a 2022 assessment by the Green Climate Fund (GCF) of approaches to financing forests, it is estimated that USD 300-400 billion is required each year to preserve and restore ecosystems. Domestic public finance provides around USD 100 billion per year for nature based solutions, including land restoration, improved ecosystem management, etc. Additional financial resources are required on a large scale. However, according to the paper submitted to the Board of the GCF (2022), the crux of the matter is that: "private financial flows still largely incentivise unsustainable land use, meaning that deforestation is economically rational" (p. 4).

Around 12-15 per cent of global GHG emissions arise due to forest loss, both sources and sinks (6th Assessment, IPCC, 2023).[4] Consequently a great deal of effort by a wide range of non-governmental organisations, United Nations agencies, the World Bank and others has been devoted to setting up an international mechanism - anchored in the United Nations Framework Convention on Climate Change (UNFCCC) - which could effectively reduce deforestation and degradation; this has become known as REDD+.[5] Some of the outcomes of the process so far are briefly explored in this paper.

Consideration of many recent studies and reports dealing with NbS and REDD+ constitute the basis for the survey. Original location specific data collection has not been undertaken. Given the importance of effective natural resource management in the tropics and the urgency of the need to cut back GHG emissions, as well as to resolve resource access and land use conflicts, recent efforts to "scale up forest conservation" have generated considerable interest. Thus, it is intended to provide some insights into the prospects for effective international action to support "nationally determined" strategies.

2. A nature based solution: paying for results with REDD+

In the "Paris Agreement" negotiated at the conference of the parties to the UNFCCC in 2015 (COP 21), a scheme to reward countries (or "jurisdictions") for cutting back emissions from deforestation and degradation was recognised as component of "nationally determined contributions" (NDCs), i.e. proposals and plans to mitigate climate change. This was the culmination of a lengthy process to design a REDD+ mechanism that began at COP 13 in Bali in 2007. The four main building blocks were specified in an agreement called the Warsaw Framework, adopted at COP 19 in 2013.

In "getting ready" for REDD+ through payment for results (in tonnes of CO2eq.), it was agreed that each country (or "jurisdiction") required a forest reference emissions level (FREL), which

[3] *Finding funds for forests to support sustainable management and prevent loss and destruction has been on the international agenda for a very long time. The UN's Food and Agriculture Organisation (FAO) introduced tropical forest action plans in the 1980s. In 2008 a major study of needs and options for forest finance was published (Eliasch, 2008). But rates of loss continue to rise as documented by the FAO (2020 & 2022) and in other reports such as those by the Forest Declaration Assessment Partners (2022).*

[4] *Reducing the conversion of natural ecosystems makes a significant contribution to net GHG emissions reductions, as shown in the IPCC's summary of opportunities for scaling up climate action (2023, p. 28).*

[5] *REDD+ is defined as reducing GHG emissions from deforestation and degradation, together with the sustainable management of forests and the conservation and enhancement of forest carbon stocks.*

would specify the GHG emissions from the sector over a given period of time (a baseline). In addition, arrangements for "robust and transparent" monitoring, verifying and reporting on forest and land use change, as well as a "safeguard information system" would ensure the "social and environmental integrity" of the mechanism.[6] Finally a REDD+ strategy or action plan would define and describe the measures proposed in order to achieve results.

Since 2015 with the approval of the REDD+ mechanism many parties to the convention have been engaged in both "readiness" and in implementing national policies, measures and strategies. The third stage of the process – payment for results – depends on verification. Thus, a REDD+ "data platform" is managed by the UNFCCC and at least 50 designated agencies in tropical countries have submitted estimates of emissions levels (FRELs), forest strategies, safeguard information systems and so.[7] In mid-2023 20 African countries are amongst these.

The importance of effective and credible monitoring and information systems underpinning the REDD+ mechanism cannot be underestimated. As the basis for international payments for reduced emissions, the reliability of the system is vital. The problems of "additionality", of double counting of emissions reductions, the permanence of any cutback and the risks of "leakage" displacing deforestation from one region to another, are of particular concern and necessitate high levels of "integrity" (Böttcher et al, 2023, Sandker et al, 2022, UNDP, 2022)

As noted above, several United Nations agencies, the World Bank and a number of major NGOs (BINGOs) have been key partners in the design of REDD+. Several counties have also made significant contributions, including Germany, Norway and the UK (the "GNU" group).[8] Two facilities (funds) have been particularly important:

- The World Bank's Forest Carbon Partnership Facility (FCPF) was set up in 2008. A carbon fund (CF) totalling some USD 875 million is available, with allocation of resources subject to the conditions of an emissions reduction purchase agreement (ERPA) negotiated in each case.[9] Recently, after lengthy "readiness preparation" Ghana and a couple of other countries have concluded agreements to access the fund.

- In accordance with the provisions of the UNFCCC, in 2016 the Green Climate Fund established a "pilot programme" of results based payments for REDD+ with an initial allocation of USD 500 million. Seven Latin American countries and Indonesia have

---

[6] *Seven safeguards were adopted at COP 16 in Cancún. These aim to ensure that REDD+ addresses the rights of IPLCs, social participation, the preservation of natural ecosystems and biodiversity, etc.*

[7] *The platform is at https://redd.unfccc.int The UNDP operates a "Paris Agreement, Land Use, Land Use Change and Forestry (LULUCF) and NDC Tool" (called PLANT) to collate the information on the platform in order to chart overall progress towards REDD+ outcomes (emissions reductions in tonnes of C02eq.). https://www.climateandforests-undp.org/plantquarterlyreport The FAO also tracks REDD+ progress "from reference levels to results" (Sandker et al, 2022).*

[8] *A vast literature assessing REDD+ and finance for tropical forests can be consulted. Early studies included those by Angelsen et al (2009) and Funder (2009). Support for REDD+ efforts provided by international agencies has been subjected to numerous evaluations in the course of the last ten years: see inter alia, reports by Blomley (2017) and NORAD (2017) as well as a synthesis by the OECD (2016).*

[9] *See: https://www.forestcarbonpartnership.org*

accessed these resources and assessment of verified progress towards reducing emissions in order to trigger payments is underway.

The voluntary carbon market (VCM) has also become an important mechanism for efforts to finance low carbon development around the world. Issuing carbon credits for projects that demonstrate reduced emissions in the "forest and land use" sectors is an expanding business, with an institutional landscape comprising numerous private companies and specialised verification systems. However, recent controversies associated with ensuring that rewards for reducing emissions are based on "high quality, jurisdictional integrity" have led to some doubts and reticence about the effectiveness of these schemes.[10]

What has been achieved through REDD+? Some observers are not impressed (Karsenty, 2021). Despite the appeals for joint concerted global action to reduce deforestation and degradation (in New York in 2014 and again in Glasgow in 2021), rates of forest loss are generally high. Global demand for food and timber as well as for minerals continue to drive the expansion of agriculture, extractive industries and other land use into forests. Recent data indicate that only tropical Asia may be "on track" to halt deforestation by 2030.[11]

3. Brief evidence on results based payments in three countries

To illustrate the progress made towards reducing emissions from deforestation and degradation in tropical countries, measures taken and issues arising in three countries are briefly considered in the following. Bolivia, Ghana and Indonesia are contrasting cases, from which many insights can be derived. Key indicators for these countries are shown in the table.

Key data for three countries

	Bolivia	Ghana	Indonesia
Population, 2022 millions	12.0	32.4	279.1
GDP per capita 2021, USD at PPP	8846	5791	13027
GHG emissions 2019, tCO2eq./year	140,000,000	48,800,000	2,000,000,000
GHG emissions 2019 per capita, tCO2eq.	12.0	1.6	7.24
Forest area, 1990 1000 ha.	57805	9924	118545
Forest area, 2020 1000 ha.	50834	7986	92133

Sources: FAO (2020), Our World in Data, World Bank (2022 & 2023)

[10] *The main issues in using carbon markets to fund forest management are summarised in a note by NICFI (2023). See also studies by the UNDP (2021), the WEF (2022) and the WWF (2021).*

[11] *See in particular the latest report by the Forest Declaration Assessment Partners (2022): Forest Declaration Assessment - Are we on track for 2030? www.forestdeclaration.org*

Bolivia is an Amazon basin country and shares many of the challenges faced in neighbouring Brazil in terms of tackling land use change. But until recently the government adopted a critical stance towards REDD+. The government in Ghana has been involved in REDD+ since the outset, completing the "readiness" steps and starting to draw on results based payments from the World Bank's FCPF in 2023. Indonesia is one of the "big three" tropical forest countries, together with Brazil and the Democratic Republic of Congo (DRC). The government has focused on the REDD+ process in terms of NDC commitments and has also started to receive results based payments from both the GCF and the World Bank.[12]

Results based payments in three countries

	Bolivia	Ghana	Indonesia
Annual change in forest area, 2010-20	-0.43%	n.a.	-0.78%
FREL submitted to the UNFCCC in tCO2eq./year (with reference period)	99,390,557 (2016-21)	1,526,457 (2001-15)	267,000,000 (2006-20)
Norway (NICFI), in USD	None	None	56 million for results from 2016-17, total of 11 million tCO2eq.
Green Climate Fund (GCF) pilot REDD+ results based payments, in USD	None	None	104 million for results from 2014 to 2016 submitted to the UNFCCC, total of 20 million tCO2eq.
World Bank, FCPF Carbon Fund, Emissions Reduction Payment Agreement (ERPA) in USD	None	4.9 million for results from 2019 to 2024, estimated 10 million tCO2eq.	110 million for results submitted to World Bank, estimated total of 22 million tCO2eq.

Sources: FAO, GCF, UNDP and World Bank

Despite participation in the initial negotiations to design an international mechanism for REDD+, in 2012 the Bolivian government opted for an alternative approach emphasising "joint mitigation and adaptation" for tropical rainforest management. This was included in the UNFCCC's Paris Agreement, as the government lobbied for "non-market", low carbon strategies. The upshot was that Bolivia did not participate in the preparations - i.e. the steps defined for REDD+ readiness – and thus did not qualify for results based funding through the international scheme (Müller et al, 2014).

[12] *As an aside, it is worth noting that from the mid-1990s to around 2017-18 Danish development assistance was a "not-insignificant driver" of natural resource management schemes in these three countries: i) through support for indigenous people's land titling (in Bolivia); ii) through a "pro-poor" scheme with the IUCN in Ghana which emphasised stakeholder consultations and gender equity in forest management; and, iii) through rainforest conservation and co-funding of community forest management with the World Bank in Indonesia. These development programmes have all been phased out.*

Meanwhile, there has been a steady expansion of the "agricultural frontier" in the Amazon lowlands with considerable loss of rainforests as soya bean cultivators (exporters) and cattle ranchers have encroached in many regions. These processes have accelerated over the past decade as the government seeks to re-locate farmers from the Andean highlands whose agricultural production systems have been undermined by lack of water resulting from drought and melting glaciers caused by… climate change. With widespread severe forest fires and land clearance schemes for farming, Bolivian per capita GHG emissions have rapidly increased to amongst the highest levels in Latin America.

Recently the stance of the Bolivian government appears to be changing, possibly due to recognition that international funding through the GCF could be used to improve forest protection and management, as is the case in seven other Latin American countries. At the beginning of 2023 the government finally submitted a FREL to the UNFCCC.[13] Nonetheless, for the time being no additional GCF funds have been allocated for a new round of results payments, such that the GCF REDD+ scheme remains a "pilot."

As Andersen et al (2022) have argued, tackling the drivers of deforestation in Bolivia is increasingly urgent. This could be done by introducing compensation payments for farmers, linked to verified reductions in forest losses measured in hectares (rather than in tonnes of CO2eq). Interestingly, the groundwork for such a scheme could build on the collective land titles that have been registered over the years, particularly for IPLCs. However, it remains to be seen whether the government will aim for full participation in another round of GCF payments having submitted the forest emissions baseline to the UNFCCC.

The government of Ghana has fully participated in the design and implementation of REDD+ since the outset. In addition to the FREL submitted to the UNFCCC in 2017 (with an update in 2021), the government – through the Forestry Commission - has published a REDD+ national strategy, consolidated the forest monitoring system and defined comprehensive safeguards information arrangements.[14] Together with Mozambique, Ghana appears to be in the forefront of African efforts to prepare for results based payments.

The main concern in Ghana is to develop land use practices that will reduce the very high rate of deforestation – recently estimated at 3 per cent annually (WEF, 2022) - largely caused by extractive industries such as gold mining and by felling forests and converting land for cocoa cultivation. The government has been successful in attracting international finance to support these efforts, with forest investment programmes backed by multinational development banks and by private companies involved in export crop production. These efforts are described as a "commodity based approach to forest conservation."[15]

Having signed an ERPA in 2019, funding by the World Bank is expected to contribute to the Forestry Commission's programme in "hotspot intervention areas", where cocoa farmers and

[13] *See: Estado Plurinacional de Bolivia (2023).*

[14] *The FRELs and other main documents underpinning REDD+ in Ghana are available at the UNFCCC's REDD+ platform and through GHREDD+ https://www.reddsis.fcghana.org/about.php*

[15] *See, inter alia, the study of "cocoa-driven deforestation" by Asiagbor et al (2022) and the report on forest conservation by the WEF (2022).*

agro-enterprises will participate in improved landscape management, targeting both crop yields and forest management, including agro-forestry.[16] Some 800,000 farmers are being encouraged to restore degraded land and plant new shade trees with a view to increasing cocoa yields. The arrangements for qualifying for FCPF payments are based on a verification methodology for the specific jurisdiction concerned and not on the national FREL.[17]

Ghana was not amongst the first group of countries to qualify for the GCF pilot programme for REDD+ results based payments. In any case, a critical unresolved issue in forest and landscape management in Ghana is underlined in a recent assessment of pathways to low carbon development: "Further action is required on land and tree tenure security with buy-in from traditional leaders, landowners and farmers. The recognition of land rights can enhance land tenure security for landholders and can be a key incentive for the implementation of climate smart agricultural practices that enhance the adaptive capacity of crops and ecosystem services. Clear and recognised tenure rights are especially important for women who face discriminatory land rights and for receiving performance based payments from carbon financing instruments" (World Bank, 2022, p. 21).

Turning to Indonesia it is worth noting that as in Ghana, REDD+ generated considerable interest from the outset. The idea of benefitting from international commitments to provide forest finance was attractive to the Indonesian government, which has made considerable efforts to design and implement low carbon development strategies in the past decade; not surprisingly given the scale of the challenges. It is estimated that deforestation and forest fires account for around 42 per cent of Indonesia's GHG emissions.

The REDD+ process in Indonesia is replete with twists and turns. An initial agreement with Norway aimed to consolidate reduced deforestation and degradation through a moratorium on land use change.[18] At the same time a large number of schemes backed by both international agencies and numerous other bilateral partners - including Australia, the European Commission, Japan, etc. - have been undertaken to determine the dynamics of forest loss and to devise policies and measures to deal with the drivers of land use change. In parallel, various forest sector investment programmes have also been important. Tackling the conversation of rainforests into palm oil plantations - with massive peat fires across the archipelago - has been the main concern.[19]

---

[16] *Four years elapsed from the signature of the ERPA to the transfer of the first FCPF payment of USD 5 million towards an estimated emissions reduction of 10 million tCO2eq from 2019 to 2024. See: http://www.ghanaredddatahub.org*

[17] *Key recent documents include the 2021 update report to the UNFCCC and the revised FREL (Republic of Ghana, 2021a and 2021b). Further information on the Ghanaian ERPA and requirements for results based payments by the World Bank is at: https://www.forestcarbonpartnership.org/country/ghana*

[18] *Although this agreement was subsequently abandoned - since the Norwegian government did not transfer the expected payments - in 2022 it was revived, to the tune of USD 56 million as compensation for over 11 million tonnes of verified emissions reductions from 2016-17 (as shown in the table, above). Updates can be found on Mongabay: https://news.mongabay.com/2022/11/in-new-climate-deal-norway-will-pay-indonesia-56-million-for-drop-in-deforestation-emissions/*

[19] *There is an extensive literature on the dynamics of land use change. A historical survey by Gaveau et al (2022) indicates that slowing deforestation resulted from reduced oil palm cultivation, where "price declines were associated with the decrease in industrial plantations and decrease of forest loss."*

The Indonesian government has successfully consolidated these initiatives within the framework of a programme on forests and land use (FOLU) as a "net sink" for reduced GHG emissions. This includes the establishment of an environment fund for forests (BPDLH) as defined in the national REDD+ strategy. Furthermore, the reference emission level (FREL) has been submitted to the UNFCCC - both in 2016 and as a revised update in 2022 - together with specification of the forest monitoring system, arrangements for verification and reporting as well as for safeguards. In short, Indonesian REDD+ preparation and implementation has satisfied the various requirements laid down in the UNFCCC's Warsaw Framework and Paris Agreement.[20]

As shown in the table above, in approving verified emissions reductions the GCF (REDD+ pilot) has included a first allocation of results based payments to Indonesia to the tune of USD 103 million, aiming to improve and expand social forestry schemes involving local communities.[21] Furthermore, in 2020 the World Bank signed an ERPA for a scheme in East Kalimantan, entailing a payment of USD 110 million for expected emissions reductions of up to 22 million tCO2eq. The Indonesian government is also setting up a carbon trade scheme. As Böttcher et al (2023) note in a recent survey of global progress towards results based payments: "Forestry can be one of the sources of carbon credits traded", while "Indonesia will develop its own standards and registry" for this purpose (p.173).

As in Ghana, the question of land use planning and regulation based on recognised tenure rights is important in Indonesia. In an overview of climate change and development options the World Bank (2023, p. 21) argues that expanded forest protection in peat-lands and mangroves is a priority, ensuring that "conservation values are correctly designated" and the "tenure of different land functions is clarified." Strengthening law enforcement in Indonesia is complicated and fraught with conflicts and uncertainties (Lund, 2020). Nonetheless, it is an essential component of the low carbon development strategies for the future, in Indonesia and elsewhere.[22]

4. Some observations and a conclusion

Despite the increasing focus on forests and land use change that is found in international declarations and in proposals for low carbon development pathways, the outcomes are not impressive. "Commodity-driven tree cover loss" has declined, but deforestation rates are still high." Furthermore, although many developing countries "have forest strategies in the context of REDD+, laying the groundwork for important reforms and in some cases important policy changes" there is still a long way to go. "In most cases the programmes have not yet yielded a reduction in deforestation and only a handful of countries has received payments for forest emission reductions" (Forest Declaration Assessment Partners, 2022, p. 3).

---

[20] *The main progress report, the national REDD+ strategy and the most recent FREL are published as submissions to the UNFCCC (Republic of Indonesia, 2021, 2022a & 2022b).*

[21] *The GCF project information is available at: https://www.greenclimate.fund/project/fp130*

[22] *In addition to REDD+ progress in the three countries summarised in this survey, numerous other cases are worth investigating. Policies and practices to reduce forest losses in Brazil and in the DRC are particularly significant in the global picture, while the Central African Forest Initiative (CAFI) is also of interest.*

According to Karsenty (2021), international forest finance initiatives have ignored the "political economy of deforestation." Furthermore, "REDD+ negotiators created a labyrinthine system that earns experts a fortune but has done little to help rural people overcome the farming, land and demographic constraints they face." Addressing land inequality and insecurity as well as other reforms to "transform agri-food systems" and to consolidate "institutions needed for the rule of law, may be more important than results based payments that reward circumstance rather than effort" (Karsenty, 2021, p. 46-47).[23]

Undoubtedly, the bottom line reveals that these criticisms are hard to ignore. In the case of the GCF, the initial pilot allocation of USD 500 million for results based payments is dwarfed by the substantial investments in land and natural resource management, which the organization characterizes as "joint mitigation and adaptation." Around USD 1.75 billion has been allocated for these purposes since 2015 (GCF, 2022). But as of mid-2023 there is no sign of agreement on additional funding for a new phase of the GCF's REDD+ pilot programme. As far as the World Bank is concerned, although the FCPF Carbon Fund was established in 2008, of the USD 875 million available for REDD+ results based payments less than USD 100 million has been disbursed so far on the basis of ERPAs with recipient countries and jurisdictions. In short, huge efforts have been made to create a forest finance flow, which isn't flowing very fast.

There appear to be good reasons for the difficulties encountered. Ensuring adequate and reliable measurement of gains and losses in forest cover as well as due diligence prior to transfer of payments are critical. The concerns that have arisen associated with deficiencies in the VCM arrangements also underline the problems. Little is gained by payment for reduced emissions which cannot be verified (NICFI, 2023, WWF, 2021).

Turning to the fundamental drivers of deforestation and degradation, the Forest Declaration Assessment Partners (2022) are blunt in their criticism of the failure by many companies to tackle their supply chains. Only a quarter of major companies in the agricultural sector have announced "clear comprehensive and ambitious policies to eliminate deforestation from supply chains." It will be interesting to observe the impact of the EU measures to prevent the sale of products such as coffee, chocolate and palm oil if they have been grown on deforested land (Anon, 2023). The extent to which producer countries are responsive to this new legislation will also depend on thorough tracking and verification of supply chains. Nonetheless, as a global trade measure to complement international forest finance, the new "anti-deforestation law" makes good sense.

Much depends on the strength of organisations in tropical forest zones. As the World Resources Institute and Climate Focus (2022) have argued, based on an investigation of the involvement of indigenous people and local communities (IPLCs) in forest policies and the impact in terms of the NDCs submitted to UNFCCC, the forest lands owned by IPLCs in tropical

[23] *Further investigation of the political economy of forest and land use management in Africa can be found in the papers edited by Ongolo et al (2021). See also: Caldecott (2021), Cerutti at el (2023) and Hajjar et al (2021). An interesting example of proposed policy measures for tropical forest regions is the World Bank's "economic memorandum" for Brazil edited by Hanusch (2023), "towards sustainable and inclusive development on the Amazonian frontier."*

regions have a significant potential as net carbon sinks. But, “these lands are under constant threat from ranching, mining and logging much of which is illegal and linked to corruption and collusion between governments and illegal actors.” Thus, “governments need to ensure IPLCs have full legal rights to the land they own; recognize and respect their right to free, prior and informed consent; take measures to ensure rights are respected in practice; and actively empower IPLCs to manage their forests through adequate finance and support” (p. 2).

This is an exciting agenda, responding to the need for political economic analysis as the basis for “nature based solutions.” Much can be achieved with a combination of policy reforms and additional forest investment, as well as with results based payments. However and in conclusion, external finance for forests as sinks and sources of GHG emissions will only be effective where land rights are enforced and respected - through “the rule of law, not the rule of saw”[24] - such that indigenous people and local communities are empowered to manage both natural and financial resources in the context of efforts to tackle global warming and enhance biodiversity.

[24] *Emphasised by the Economist in March 2023. Or as Cerutti et al (2023) conclude in their Chatham House report on deforestation in Africa: ”Millions of informal workers and their families living in communities in and around dry forests and rainforests in Africa have tremendous knowledge and extraordinary capacity to innovate. Their contribution will be essential to devising effective solutions. But much better mechanisms must be created for their voices to be conveyed, heard and given power to decide at local, regional, continental and global levels…”*

References

Andersen, Lykke, Luis Gonzalez & Alfonso Malky (2022): Bolivia's net zero path – investment needs, challenges and opportunities. *Frontiers in Climate*, 4.

Angelsen, Arild et al (2009). *Realising REDD+, national strategy & policy options*. Centre for International Forest Research (CIFOR), Bogor.

Anon (2023): The EU anti-deforestation law. Carbon Brief.

Ashiagbor, George et al (2022): Monitoring cocoa-driven deforestation – the contexts of encroachment and land use policy implications for deforestation free cocoa supply chains in Ghana. *Applied Geography*, 147.

Blomley, Tom (2017): Final evaluation report of the IUCN "towards pro-poor REDD+ project." Acacia Natural Resource Consultants & IUCN, Gland.

Boulton Chris, Timothy Lenton & Niklas Boers (2022): Pronounced loss of Amazon rainforest resilience since the early 2000s. *Nature Climate Change*, 12.

Böttcher, Hannes et al (2023): Potential for results based payments in the forest sector under the Paris agreement. German Environment Agency (Umweltbundesamt), Dessau-Rosslau.

Caldecott, Julian (2021): *Surviving climate chaos by strengthening communities and ecosystems.* CUP, Cambridge.

Caldecott, Julian (2022): Implications of earth system tipping pathways for climate change mitigation investment. *Discover Sustainability*, 3-37

Cappelli, Federica, Nicola Caravaggio & Christina Vaquero-Pineiro (2022): Buen Vivir and forest conservation in Bolivia – false promises or effective change? *Forest Policy & Economics*, 137

Cerutti, Paolo, Thiago Uehara & Jon Wallace (2023): Deforestation in Africa. Chatham House, London. https://www.chathamhouse.org/2023/05/deforestation-africa

Danida (2021): https://um.dk/en/danida/results/eval/eval_reports/evaluation-of-danish-funding-for-climate-change-mitigation-in-developing-countries

Duchelle, Amy et al (2018): What is REDD+ achieving on the ground? *Current opinion in environmental sustainability*, 32

The Economist (2023): Preserving rainforests – the rule of saw (March).

Eliasch, Johan (2008): *Climate change – financing global forests*. The Eliasch Review. Earthscan, London.

Estado Plurinacional de Bolivia (2020): Tercera comunicación nacional ante la Convención Marca de la Naciones Unidas sobre Cambio Climatico. APMT & MMAyA, La Paz.

Estado Plurinacional de Bolivia (2023): Nivel de referencia de emissiones forestales for la deforestación (versión 1.0). APMT & MMAyA, La Paz.

FAO (2020): Global forest resource assessment (FRA). FAO, Rome.

FAO (2022): The state of the world's forests 2022 – forest pathways for green recovery and building inclusive, resilient and sustainable economies. FAO, Rome.

Forest Declaration Assessment Partners (2022): Forest Declaration Assessment - Are we on track for 2030? www.forestdeclaration.org

Funder, Mikkel (2009): Reducing emissions from deforestation and degradation – an overview of risks and opportunities for the poor. DIIS Report 21, Danish Institute for International Studies, Copenhagen.

Gaveau, David et al (2022): Slowing deforestation in Indonesia follows declining oil palm expansion and lower oil prices. *PLoS ONE*, 17-3.

Girardin, Cécile et al (2021): Nature based solutions can help cool the planet. *Nature*, 593

GCF (2022): Current GCF approach to financing for forests and alternative approaches. Green Climate Fund, Board Meeting (July), B.33/Inf.07

Hanusch, Marek (2023): A balancing act for Brazil's Amazonian states – an economic memorandum. World Bank, Washington DC.

Hajjar Reem, Gretchen Engbring & Kailey Kornhauser (2021): The impacts of REDD+ on the socio-ecological resilience of community forests. *Environmental Research Letters*, 16-2.

IPCC (2023): Synthesis report of the IPCC sixth assessment – summary for policymakers, Intergovernmental Panel on Climate Change, Geneva.

Karsenty, Alain (2021): Geopolitics of the world's forests – strategies for tackling deforestation. Study for the French Institute of International Relations (IFRI), Paris.

Land Gap (2022): The land gap report. www.landgap.org

Lawrence, Deborah et al (2022): The unseen effects of deforestation – biophysical effects on climate. *Frontiers in forests and climate change*, 5.

Leonard, Stephen (2021): Reducing deforestation and forest degradation and conservation of forests at the Green Climate Fund – too much, too little or just enough? Forests News, CIFOR.

Li, Y., B. Mei & T. Linhares-Juvenal (2019): The economic contribution of the world's forest sector. *Forest Policy & Economics, 100*

Lund, Christian (2020): *Nine-tenths of the law – enduring dispossession in Indonesia*. Yale UP, New Haven.

Müller, R., P. Pacheco & J. Montero (2014): El contexto de la deforestación y degradación de los bosques en Bolivia – causas, actores y instituciones. Documentos ocasionales, CIFOR, Bogor.

NICFI (2023): How carbon markets done right help to stop deforestation. Norwegian International Climate and Forest Initiative, Oslo.

NORAD (2017): Norway's international climate and forest initiative – lessons learned and recommendations in the evaluation synthesis report. NORAD, Oslo.

OECD (2016): Forests and sustainable forest management - evaluation evidence. Evaluation Insights, EvalNet, OECD, Paris.

Ongolo, Symphorien et al (2021): Forestland policies and politics in Africa – recent evidence and new challenges. *Forest Policy and Economics*, 127.

Republic of Ghana (2018): Ghana REDD+ social and environmental principles, criteria and indicators. (Submission to UNFCCC)

Republic of Ghana (2021a): Third biennial update report (BUR 3) to the UNFCCC. Environmental Protection Agency (EPA), Accra

Republic of Ghana (2021b): National forest reference emissions level (FRL/FREL). Ghana Forestry Commission, Accra. (Submission to UNFCCC)

Republic of Indonesia (2016): National Forest Reference Emission Level for Deforestation and Forest Degradation. Directorate General of Climate Change & Ministry of Environment & Forestry, Jakarta (Submission to UNFCCC)

Republic of Indonesia (2021): Third biennial update report (BUR 3) to the UNFCCC. DGCC-MoEF, Jakarta.

Republic of Indonesia (2022a): National forest reference level for deforestation, forest degradation and enhancement of forest carbon stock. Directorate General of Climate Change & Ministry of Environment & Forestry, Jakarta. (Submission to UNFCCC)

Republic of Indonesia (2022b): REDD+ national strategy 2021-2030. DGCC, Ministry of Environment & Forestry (MoEF), Jakarta.

Sandker, Marieke et al (2022): From reference levels to results – REDD+ reporting by countries. Forestry working paper 35, FAO, Rome.

Smith, C., J. Baker & D. Spracklen (2023): Tropical deforestation causes large reductions in observed precipitation. *Nature Online*

*** Source Material/Die Zeit/The Guardian (2023): ***

Speirs, Mike (2016): Combining forces and resources for REDD+. Discussion paper for the UN-REDD Programme, Geneva.

Sunderlin, William et al (2018): Creating an appropriate tenure foundation for REDD+ - the record to date and prospects for the future. *World Development*, 106.

UNDP (2021): High integrity voluntary carbon markets – emerging issues in forest countries. United Nations Development Programme, New York.

UNDP (2022): Nature-based solutions – finance for NDCs. United Nations Development Programme, New York

WEF (2022): Forests for climate – scaling up forest conservation to reach net zero. World Economic Forum, Geneva.

World Bank (2022): Ghana – country climate and development report. World Bank, Washington DC.

World Bank (2023): Indonesia – country climate and development report. World Bank, Washington DC.

World Resources Institute & Climate Focus. (2022): Sink or swim - How Indigenous and community lands can make or break nationally determined contributions. https://forestdeclaration.org/resources/sink-or-swim

WWF (2021): A blueprint for high quality interventions that work for people, nature and climate. World Wide Fund for Nature, Gland.

Acknowledgements

From 2008 to 2016 I was involved in the global "readiness" effort, notably as a senior adviser with the United Nations REDD+ program (2014-16) bringing together expertise from the FAO, the UNDP and UNEP and operating through a small secretariat in Geneva. In concluding my contract I reviewed REDD+ progress in notes for discussion (Speirs, 2016). The reflections in this paper aim to bring my story of REDD+ up to date. I am grateful for comments and suggestions received from colleagues at the Danish Institute for International Studies (DIIS) and elsewhere, notably: Peter Albrecht, Tom Blomley, Mikkel Funder, Marie Gravesen, Lars Engberg-Pedersen, Peter Iversen, Jakob Kronik, Iben Nathan, Henning Nøhr, Caroline van der Sluys and Martin Speirs. I am of course solely responsible for the content of this survey.