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## Manuscript title

Synergies between Land Degradation Neutrality goals and existing market-based instruments

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## Highlights

- Offsets and public-private partnerships have been explored to promote LDN
- Synergies exist with between LDN goals and existing market-based instruments
- Relevant schemes cover carbon, biodiversity, watershed protection and bioenergy
- Mandates, tax breaks and multifunctional indices could be adapted to integrate LDN

## Abstract

Since the concept of the Land Degradation Neutrality (LDN) emerged in global policy discourse, a key point of contention has been the development of market-based instruments to promote the LDN agenda. Much of this discussion has focused on the use of LDN-specific offset mechanisms and private-public partnerships. However, there is also an opportunity to capitalise on the synergies that exist between LDN objectives and those of existing market-based instruments that have previously been developed for carbon, biodiversity, bioenergy and in other contexts. LDN objectives could be integrated into such schemes through targeted eligibility rules and certification schemes, supporting methodologies, adaptations to multifunctional indices used in auction-based approaches and the restructuring of mandates, tax breaks and feed-in tariffs for bioenergy and other products.

## Key words

Land degradation neutrality; market-based instruments; payments for ecosystem services; land degradation; desertification; UNCCD

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## **Synergies between Land Degradation Neutrality goals and existing market-based instruments**

### **1. Introduction**

Sustainable Development Goal 15, adopted by the United Nations (UN) General Assembly in September 2015, calls for action to combat desertification, and halt and reverse land degradation (UN, 2015). More specifically, the concept of land degradation neutrality (LDN) is endorsed by target 15.3: “By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”. This target complements and extends the work of the UN Convention to Combat Desertification (UNCCD), which was established in 1994 and has been ratified by 195 countries and the European Union (UNCCD, 2018b).

Despite science and policy acknowledging the extent and costs associated with land degradation (Gibbs and Salmon, 2015; Safriel, 2007; Zika and Erb, 2009; ELD Initiative, 2015), the UNCCD has struggled to attract private sector support for combatting land degradation and the Global Environment Facility has historically allocated less funding to its land degradation project portfolio than to biodiversity and climate change (Chasek, 2013; Chasek et al., 2015). It is against this backdrop that the concept of a land degradation neutral world emerged in Rio+20, as an aspirational goal in ‘The future we want’ (United Nations System Task Team, 2012). Scientific experts have since worked on a technical definition of land degradation neutrality (LDN) in tandem with its insertion in the global sustainable development agenda (Safriel, 2017), with the definition adopted by the UNCCD being “a state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems” (UNCCD, 2015a, p. 10).

The use of the ‘neutrality’ terminology in LDN, combined with the historical challenges in obtaining funding for land degradation projects, has evoked comparisons with offsetting mechanisms used for carbon and biodiversity and a focus on market-based instruments more broadly (Tal, 2015; Safriel 2017). This follows a broader trend of market-based or neoliberal influences on international environmental policy since the 1980s, including in relation to pollution, degradation, protection and restoration (Baumber, 2017b; Stavins, 2000). Market-based thinking has also been influential on the post-2015 sustainable development agenda (Jomo et al., 2016; Pinget, 2015), including the call by the United Nations General Assembly for businesses to apply their creativity and innovation to addressing the SDGs (UN, 2015).

Market-based instruments (MBIs) can include a wide range of measures such as grants, subsidies, auctions, taxes, charges, penalties, tradable permits, public-private partnerships and certification programs. Many, but not all, MBIs can also be classed as payments for ecosystem (or environmental) services (PES). Grants, subsidies and tradeable permit schemes may qualify as PES if the arrangement is voluntary, involves at least one ‘seller’ and one ‘buyer’, and is conditional on the delivery of a well-defined environmental service or land use activity likely to secure that service (Wunder, 2005). In contrast, other MBIs may not qualify as PES, such as non-voluntary penalties or taxes used to incorporate environmental externalities (e.g. greenhouse gas emissions) into market prices for goods

and services, or voluntary certification schemes that influence consumer choices but do not involve direct payment for the ecosystem services that are enhanced or maintained.

The ability of MBIs to increase the cost-effectiveness of public spending on environmental protection and restoration, as well as to increase the funding available from private sources, has previously been demonstrated in diverse contexts such as the United States, Costa Rica, Australia and Indonesia (Hellerstein et al., 2015; OECD, 2010; Porras et al., 2013). However, while MBIs may assist with these challenges, they also carry risks that certain projects will be compromised, simplified, under-valued or traded off against environmental destruction elsewhere. The opportunities and risks are likely to increase as schemes progress in complexity towards markets involving multiple buyers and sellers, with their increased requirement that environmental outcomes be substitutable for one another (Baumber, 2017b).

With the UNCCD Strategic Framework 2018-2030 envisioning a future that avoids, minimises, and reverses desertification/land degradation while striving to achieve a land degradation-neutral world (UNCCD, 2017b), there is an opportunity for the Parties to the Convention, its Secretariat, implementation mechanisms and other advocates of LDN to learn from existing environmental markets. This has the potential to not only inform the development of LDN-specific MBIs, but also to identify and capitalise on synergies that may exist between existing environmental MBIs and the LDN agenda. In section 2, we discuss the extent to which market-based approaches have been explored to date in relation to LDN before analysing synergies with existing environmental MBIs for carbon, biodiversity and other factors in section 3. Section 4 considers the risks and challenges associated with the adaptation of existing MBIs and discusses possible pathways forward.

## **2. Market-based approaches previously explored in relation to LDN**

Much of the discussion around market-based instruments and LDN has taken place in relation to the LDN Target Setting Programme (LDN TSP) and the LDN Fund. The LDN TSP was developed under the guidance of the UNCCD's Science-Policy Interface to help set LDN targets at the national level, while the development of the LDN Fund has been led by the UNCCD Global Mechanism to leverage private finance to support the achievement of LDN.

The LDN TSP, and LDN more broadly, is underpinned by a notion of “no net loss”, whereby any losses of health and productive land are balanced by commensurate gains (Cowie et al., 2018). As this principle of “no net loss” also underpins market-based offsetting schemes applied to contexts such as biodiversity, wetlands and carbon, the potential for offsetting to also play a role in LDN has been hotly debated (see Chasek et al., 2015; Orr et al., 2017; Salvati and Carlucci, 2014; Stavi and Lal, 2015; Tal, 2015; Welton et al., 2015). Offsetting was most prominent during the tenure of Luc Gnacadja as UNCCD Executive Secretary from 2007 to 2013 (Safriel, 2017), particularly with the incorporation of the offsetting principle into a 2012 policy brief commissioned by the UNCCD Secretariat, which referred to land degradation neutrality as a situation “whereby land degradation is either avoided or offset by land restoration” (UNCCD, 2012).

COP12 in 2015 created opportunities for the UNCCD to further explore market-based offsetting mechanisms by reaching agreement on the LDN definition and requesting the Global Mechanism and the Secretariat to develop options for its implementation. While offsetting offers a potential mechanism for leveraging private financing for restoration, the development of a LDN-specific offsetting program also presents a range of challenges such as ensuring the reliability of trades, defining clear quantifiable units of measure, ensuring equivalence across a wide range of land types, risks related to time lags, concerns around community impacts and the risk of legitimising degrading practices that might not otherwise occur (Tal, 2015; Welton et al. 2015; Orr et al. 2017).

The 2017 conceptual framework for LDN developed by the Science-Policy Interface of the UNCCD acknowledges the various challenges with offsetting, recommending that in the process of developing initiatives for LDN implementation, countries consider lessons learned and best practices from policies related to carbon and biodiversity offsetting (Orr et al., 2017). More to the point, based on experiences from implementing biodiversity offsetting, the framework for LDN cautions on the potential legitimisation of degradation practices in cases where offsetting can be cheaper than to avoid, reduce or reverse degradation. Hence, the emphasis of the conceptual framework has been on a hierarchy of 'Avoid-Reduce-Reverse' that, although it does not preclude the possibility of offsetting in the future, does not make it a central feature of the current framework for achieving LDN (Cowie et al., 2018).

The LDN Fund (Impact Investment Fund for Land Degradation Neutrality) was launched at COP 13 in 2017 (UNCCD, 2017c). As of September 2018, commitments to the fund totalled USD 100 million towards a target of USD 300 million (UNCCD, 2018c). In its 2016 White Paper, the LDN Fund was pitched as a blended-finance mechanism to raise and deploy private finance for degradation avoidance and rehabilitation, because it was assumed that public funding will not be sufficient (Mirova and UNCCD, 2016). The Fund is managed under the natural capital platform of Mirova, a private sector investment management firm, with a separately-operated Technical Assistance Facility to support promising sustainable land use activities and build up a portfolio of bankable projects (Mwangi, 2017). To be eligible for investment through the LDN Fund, land management projects must meet four criteria (Mirova and UNCCD, 2016). These are: (1) having a high environmental and social contribution; (2) being large-scale or with potential for upscaling and replication; (3) being mature projects ready for investment (i.e. not at an early scoping stage); and (4) designed to be financially profitable for investors.

The LDN Fund has been designed to take a landscape approach that includes collaboration between smallholders, local communities, business and government around activities such as sustainable agriculture, sustainable livestock management, agro-forestry, and sustainable forestry (UNCCD, 2018a). However, the requirements for projects to be mature, profitable and able to be replicated may make it difficult for emerging or innovative projects, ecological small-scale practices, or projects without a clear pathway to profitability to obtain funding, as well as creating a focus on reliable food and fibre projects over projects aimed at enhancing other types of ecosystem functions and services (Maillard and Cheung, 2016). This risk is highlighted by findings from a first group of 14 LDN target setting pilot projects that reported some very high costs for Sustainable Land Management (SLM) restoration and rehabilitation measures to combat desertification and land degradation (UNCCD, 2017a). For example, the pilot program estimated costs to be over USD 6000 per hectare in Chad, much higher

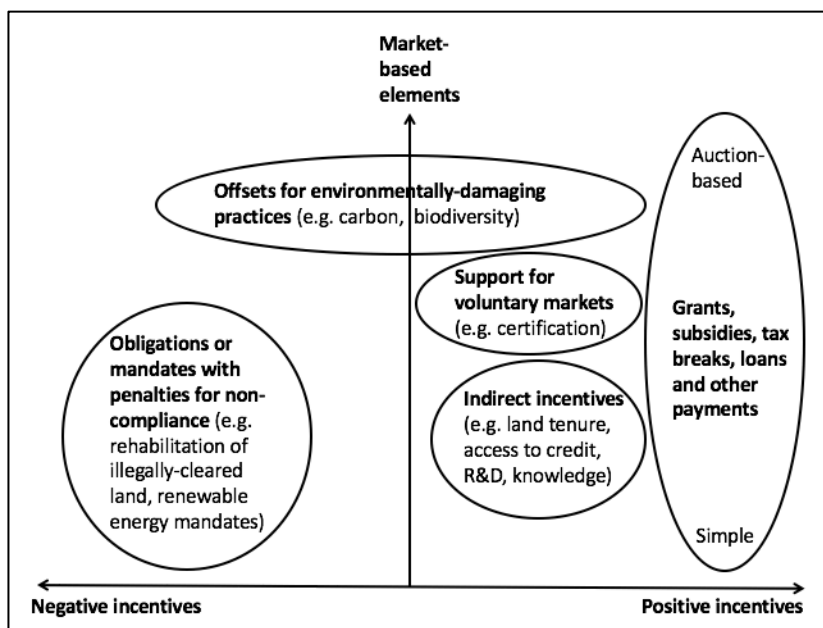
than previous estimates of “USD 20 to rehabilitate one hectare of farmland in Africa” (UNCCD, 2015b, p. 9).

Given the risk that projects offering high social or environmental benefits but low profitability may be overlooked by the LDN fund, various researchers have explored methodologies for valuing ecosystem services related to LDN and targeting investment most cost-effectively (e.g. Dallimer and Stringer, 2018; Schild et al., 2018; Willemsen et al., 2018). There is potential to further inform this work by drawing on experiences with other environmental MBIs used to promote carbon sequestration, biodiversity conservation and other ecosystem services. Furthermore, beyond seeking to develop LDN-specific MBIs, there may be opportunities to promote SLM, restoration and rehabilitation by adapting or ‘piggy-backing’ on existing market-based approaches used in other sectors. These potential synergies are explored in the following section.

### **3. Potential synergies between LDN and existing environmental MBIs**

Addressing land degradation has synergies with other global environmental objectives, particularly around carbon sequestration and biodiversity conservation. Throughout its history, the UNCCD has been eager to capitalise on these synergies (Grainger, 2009) and the UNCCD Secretariat has argued that achieving LDN would help to address 10 out of the 17 SDGs (UNCCD, 2016).

Opportunities exist for LDN advocates to learn from global experiences around not only offsetting, but also a range of other market-based approaches, including auctions, mandates, taxation measures and voluntary certification (Figure 1). These opportunities also extend beyond carbon and biodiversity, with experiences around watershed protection, soil health and bioenergy also relevant. Furthermore, aside from informing how the UNCCD could develop its own market-based approaches, there are also opportunities to modify existing MBIs to better align them with the objectives of LDN, the UNCCD and the SDGs more broadly. These opportunities are considered in sections 3.1 to 3.5, using case studies from Australia, the United States, European Union, Brazil and Costa Rica.



**Figure 1: Examples of MBIs that can be used to enhance ecosystem services.** Policy measures are categorized based on the nature of the incentives provided (horizontal axis) and the degree to which they incorporate market principles (vertical axis). Adapted from Baumber (2017a).

### 3.1 Carbon MBIs

Climate change represents one of the most significant areas of market-based environmental policy development in recent decades. The Kyoto Protocol introduced three market-based mechanisms under the UNFCCC: emissions-trading within national or multi-national blocs, such as the EU Emission Trading Scheme (ETS); the Clean Development Mechanism (CDM), which allows emissions reduction projects in developing countries to be counted against industrialised countries' targets for emissions-reduction; and Joint Implementation (JI), which operates between industrialised countries and economies in transition (UNFCCC, 2018). Carbon trading typically works by requiring emitters of greenhouse gases to hold permits or meet targets relating to their emissions, with additional permits or credits able to be obtained through offsetting (e.g. paying for other emitters to reduce emissions or paying landholders to sequester carbon through land use change). Aside from cap-and-trade schemes with multiple buyers and sellers, other approaches include carbon taxes, fixed-price permit schemes (where governments act as a single seller of permits) and auction-based approaches (where a single buyer such as a government agency seeks to buy emissions reductions or offsets from the lowest bidder).

Australia provides a useful case study of the potential to use carbon-related MBIs to combat land degradation. This is both because it has experimented with a range of carbon-related MBIs, including cap-and-trade, a fixed carbon price (or 'carbon tax') and auction-based approaches, and because restoration objectives have been incorporated into each of these policy iterations (Baumber, 2016). In 2007, the Australian Government adopted a cap-and-trade policy, which led to the introduction of the Carbon Pollution Reduction Scheme (CPRS)

in 2011 (Commonwealth of Australia, 2011). However, the CPRS only ever functioned in its initial format based around fixed permit prices and no caps (i.e. effectively a carbon tax), as the 2013 election of a Liberal/National coalition government led it being dismantled before it could transition to a fully-fledged cap-and-trade scheme. In place of the CPRS, an Emissions Reduction Fund (ERF) was introduced that employed a reverse auction approach to distribute Government funds to providers of emission reductions and biosequestration.

Reforestation and regeneration projects were eligible to generate sequestration credits in Australia under both the CPRS and ERF, with the Australian Government approving a range of methodologies to facilitate this. Some of these methodologies are explicitly aimed at creating co-benefits that extend beyond carbon sequestration. For example, the methodology for human-induced forest regeneration has been designed to promote “additional benefits” such as “improved quality of your land and water supply, increased biodiversity and shade and shelter for stock” (Clean Energy Regulator, 2018). Further methodologies that combine carbon, biodiversity and other ecosystem attributes continue to be proposed (Waters et al., 2018).

The strategic development of methodologies and guidance aimed at promoting co-benefits can help to overcome one of the key limitations of carbon trading, namely its focus on a single metric (tonnes of CO<sub>2</sub>-equivalent). This narrow focus conflicts with the much broader focus of land degradation neutrality, which incorporates soil health, biodiversity, productivity and social dimensions. While there is limited scope to vary the units of trade in carbon trading schemes due to the need for global-scale substitutability, governments can play an important role in influencing the type of carbon credits that are given preference in trading systems through the development of methodologies and enabling frameworks. In contrast to the experience in Australia, a lack of suitable methodologies and institutional support have been a barrier to CDM reforestation projects (Thomas et al., 2010) and the EU has elected to exclude reforestation activities (and any co-benefits they could potentially offer) as eligible sources of offsets due to concerns around data and reporting systems (European Commission, 2012).

For advocates of LDN, the integration of SLM and restoration principles onto carbon offset methodologies and institutional support mechanisms offers a potential means of harnessing LDN objectives to the increasing market valuation of sequestered carbon through a process of ‘coupling’ (Liu et al., 2007).

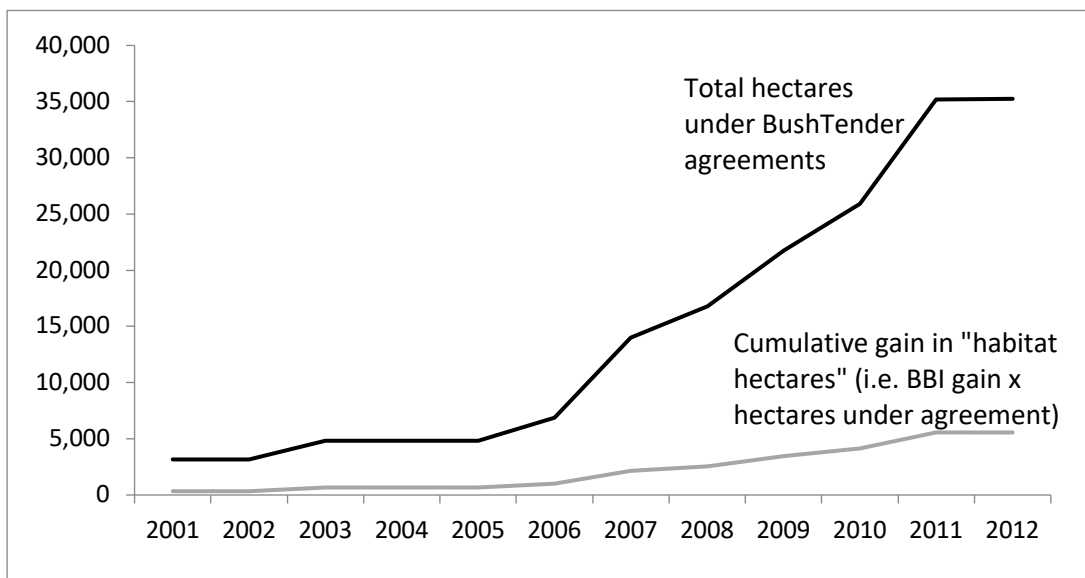
### **3.2 Biodiversity MBIs**

As with carbon, biodiversity enhancement can be promoted using a variety of MBIs, including tradeable offsets, grants and auctions. In the case of biodiversity offsets, demand typically stems from developers wanting to undertake environmentally-damaging activities that would not ordinarily be permitted. Under such schemes, a gain in habitat value at the offset site may be used to compensate for a loss of biodiversity at the development site provided that there is “no net loss” overall. This principle of “no net loss” was pioneered in the US for wetlands in the 1970s and has subsequently been employed in other jurisdictions, such as Australia and the UK (Doswald et al., 2012).



The Biodiversity Offsets Scheme (replacing a former scheme called BioBanking) in the Australian state of New South Wales (NSW) provides an example of how biodiversity offsetting may be used to promote rehabilitation of degraded land. While the assessment method manual for the Biodiversity Offsets Scheme is still under development (at the time of writing), the previous BioBanking scheme included plant regeneration as one of the activities that can be used to generate biodiversity credits under the scheme, along with controlling grazing, retaining fallen timber, managing fire and controlling pests and weeds (OEH, 2014). Offsets schemes may include 'like-for-like' provisions and offset ratios to deal with uncertainty by requiring an offset area to be larger than the area lost (Quétier and Lavorel, 2011). However, even where offset ratios result in offset areas that are much larger than the areas cleared, such as in NSW, there may be a time lag before 'no net loss' is achieved if offsets are based on avoiding deforestation rather than active improvement of offset areas (Gibbons et al., 2018). One of the recommendations of a 2014 review of BioBanking in NSW was that landscape-scale impacts be considered strategically when assessing development and offset sites, an approach which highlights the potential for synergies with the landscape approach being taken with the LDN Fund (UNCCD, 2018a).

Aside from offsets, biodiversity enhancement can be encouraged through grants from the public or private sector, with auctions offering a mechanism for making such grant schemes more 'market-based'. In contrast to the offsetting approach in NSW, the neighbouring state of Victoria has opted for an auction-based approach called BushTender. This process involves multiple providers of restoration services competing for a fixed pool of government funds, with a Biodiversity Benefit Index (BBI) used to compare bids (DEPI, 2014). The BBI score assigned to each bid is converted into a "habitat hectares" score by multiplying the BBI increase by the area of land restored (Figure 2).



**Figure 2: Cumulative hectares under BushTender agreements and gain in habitat hectares 2001-2012.** Adapted from Baumber (2017b). Source: DEPI (2014)

While both offsets and auctions can be used to encourage rehabilitation of degraded land, they differ in terms of the stakeholders they involve, the funding sources they present and their impacts on other ecosystems. While auctions rely on a single funding source (usually government), offsetting can leverage private funds for restoration. However, auctions only affect the areas of land being offered for restoration, while offsetting has an impact on both the area being restored and the area being degraded (Doswald et al., 2012).

### **3.3 MBI relating to other ecosystem services**

Apart from carbon sequestration and habitat for biodiversity, MBIs have also been used to promote other ecosystem services, such as watershed protection. In other cases, a number of ecosystem services have been combined together into multifunctional MBIs.

Costa Rica provides an example of a PES scheme that includes factors other than carbon and biodiversity, with watershed protection and landscape beauty also attracting payments (Porrás et al., 2013). The demand in this case stems from a desire by businesses, mostly hydro-electric companies, to be seen as socially responsible, with a system of certificates used to enable efficient over-the-counter transactions. While the main impetus behind Costa Rica's embrace of PES was a desire to slow deforestation rates (resulting in 860,000 ha of forest being protected between 1997 and 2012), the program has also resulted in the active reforestation of 60,000 ha and the natural regeneration of another 10,000 ha (Porrás et al., 2013).

The US Conservation Reserve Program (CRP) employs a multifunctional Environmental Benefits Index (EBI), with an auction mechanism used to select bids to be funded. While the CRP has a strong focus on soil health, it also contributes to reduced chemical use and other benefits from the re-establishment of grasses and trees (Hellerstein et al., 2015). As with other auction-based approaches (OECD, 2010), research into the efficiency of the CRP has shown its auction mechanism to be more cost-effective in delivering environmental benefits than offering a single fixed price to all participating landholders (Hellerstein et al., 2015).

### **3.4 Bioenergy MBIs**

The bioenergy sector may at first seem an unusual choice for restoring degraded land on account of controversies around forest clearance for energy cropping (e.g. Boucher et al., 2011; Gao et al., 2011; Gerasimchuk and Koh, 2013). However, while energy crops can, like other cash crops, put pressure on natural areas, they can also present opportunities to enhance soil health, water quality and even habitat for biodiversity in contexts where land is currently being managed in an unsustainable manner (Berndes and Fritsche, 2016). This is also true of other commercial land uses, such as agroforestry (Stanturf, 2015), but one factor that sets the bioenergy sector apart is the opportunity to integrate restoration objectives into the various MBIs used to promote bioenergy as a form of renewable energy across the globe (Baumber, 2017a), including mandates, feed-in tariffs and structured tax breaks.

The most notable example of rehabilitation of degraded land being integrated into bioenergy support programs is the EU Renewable Energy Directive (RED), which recognises that some forms of energy cropping have the "potential to contribute to the restoration of severely degraded and heavily contaminated land" (European Parliament and Council of the

European Union, 2015 p. L239/5). The RED incentivises the rehabilitation of degraded land by allowing such activities to qualify for a “bonus” that makes it easier for a biofuel producer to satisfy the RED’s minimum greenhouse gas (GHG) saving requirements.

The use of eligibility criteria and GHG life-cycle methodologies under the RED has similarities with the approach taken to promote environmental plantings and human-induced regeneration under Australia’s ERF scheme for carbon trading. However, the RED bonus for restoring degraded land is yet to be operationalised due to uncertainty around land-use change impacts (European Parliament and Council of the European Union, 2015) and a lack of guidance on which types of land might qualify for the bonus (Roundtable on Sustainable Biomaterials, 2015). Apart from providing supporting methodologies and certification, Baumber (2017a) argues that the RED could further incentivise the rehabilitation of degraded land by adapting its ‘double-counting’ rules to preference such activities.

In relation to bioelectricity, Germany has experimented with bonuses for landscape preservation under its bioenergy feed-in tariff program. Under this program, the tariff that electricity companies were required to pay generators for bioelectricity increased if the biomass was sourced from land managed under Germany’s Compensation Scheme for Market Easing and Landscape Protection (Wilkinson, 2011). This scheme was aimed at the preservation of agricultural landscapes for both environmental and cultural reasons (Troost et al., 2015), but similar arrangements could be used to preference bioenergy sourced from degraded land that had been rehabilitated.

Aside from mandates and feed-in tariffs, bioenergy-related grants, loans and tax breaks have the potential to be structured so as to preferentially support energy crops produced from rehabilitated land. Baumber (2017a) suggests that ecosystem services could be enhanced using an approach adapted from Brazil’s National Programme on the Production and Use of Biodiesel (PNPB). While the PNPB has provided preferential tax breaks for certified smallholder-produced feedstocks to achieve social objectives (Barros, 2014), a similar approach could also be used to incentivise the rehabilitation of degraded land. Structured tax breaks have also been widely used to promote biofuels in a wide range of jurisdictions, including the US and Australia, where they also present opportunities for policy adaptation.

### **3.5 Voluntary certification**

MBIs involving offsets, tradeable credits, auctions, mandates and tax breaks typically require high levels of government involvement to create market structures and the methodologies and eligibility rules that enable the markets to function. Voluntary certification schemes, on the other hand, provide opportunities for non-government organisations to harness the power of markets to promote restoration of degraded land. For example, sustainability certification schemes operate in a range of different sectors, including the Forest Stewardship Council (FSC) in relation to forest harvesting and plantation management, and the Sustainable Agriculture Network (SAN), whose standards underpin the certification program of the Rainforest Alliance. These schemes attempt to capitalise on consumer concerns around unsustainable production practices and attempt to shift producers towards more sustainable practices in order to maintain or build market share.

Different certification programs inevitably prioritise different ecosystem functions and services over others. Furthermore, they may also place different emphasis on maintaining versus enhancing ecosystem services. For example, the FSC standards have a strong focus on preventing over-harvesting of forests and forest clearing for plantation establishment (FSC, 2012). In contrast, the SAN/Rainforest Alliance standards have a stronger focus on enhancing rather than simply maintaining ecosystem functions, including by establishing vegetation barriers, dedicating areas to the recovery of an area's 'typical ecosystems', and expanding ground cover to prevent erosion and improve soil fertility. The FSC has recently developed a model for Forest Certification for Ecosystem Services (FSC, 2015), which could act as an enabler of future market-based schemes involving both the private and public sector, particularly in countries where governments lack the capacity to develop suitable methodologies and monitor compliance with eligibility criteria.

Certification schemes aimed at investors represent an emerging area of sustainability certification. For example, the Climate Bonds Initiative aims to mobilise investment in the USD 100 trillion global bond market for climate change solutions, with National Australia Bank claiming to be the first bank to offer a certified Climate Bond in 2014 (NAB, 2018). The latest version of the Climate Bonds Standard is aimed predominantly at renewable energy projects, but envisages that climate adaptation projects will be certified in the future and land use project criteria are under development (Climate Bonds Initiative, 2017). Certified investment of this nature could complement the LDN Fund managed by Mirova, with the UNCCD Secretariat potentially playing a role in certification of projects using LDN criteria.

#### **4. Challenges in incorporating LDN goals into environmental MBIs**

##### ***4.1 Risks and limitations of market-based approaches***

The adaptation of existing environmental MBIs relating to carbon, biodiversity, bioenergy, agriculture and forestry may provide opportunities to incentivise land uses that rehabilitate degraded land, to enhance the cost-effectiveness of limited public funds, and to mobilise new sources of funding. However, such approaches also carry risks. Using a limited set of indicators may neglect other important issues. For example, the narrow focus on carbon sequestration under the reforestation provisions of the UNFCCC has sometimes been to the detriment of other services, social issues and ecological values (McAfee, 2012). The creation of markets in particular ecosystem services can reduce the value placed on other services (Reed et al., 2015).

Many MBIs require ecosystem functions to be 'traded off' against one another, or for impacts in one location to be directly substitutable for impacts at another. Carbon trading, in isolation, has the potential to drive the conversion of biodiverse grasslands to monocultures of trees that hold more carbon but lack other values. Offset schemes for biodiversity may avoid some of these risks, but can also involve trading off mature sites for newly-restored areas that cannot offer the same ecosystem functions (Gibbons and Lindenmayer, 2007). Furthermore, they may struggle to find appropriate locations that are far enough away from the cause of degradation but close enough to serve the same social and/or ecological community (Gonçalves et al., 2015).

Multifunctional indices, such as the Environmental Benefits Index (EBI) of the US CRP, have the potential to incentivise the provision of multiple ecosystem services. However, such indices inevitably require implicit or explicit trade-offs between outcomes relating to biodiversity, soils, water and other factors. Defining which ecosystem functions and services are appropriate for a particular land unit requires a range of value judgements that may differ depending on the interests and perspectives of those making them (Hobbs, 2016; Warren, 2002; Zdruli et al., 2010). There is also a risk that auctions or tradeable credits that place monetary values on ecosystem functions deter or 'crowd-out' voluntary action (Hellerstein et al., 2015).

The complex institutional arrangements surrounding environmental MBIs can make it difficult for smaller, less-developed nations to implement them and can advantage large established actors at the expense of small-scale producers and local communities. For example, Brazil's aforementioned efforts to encourage small family farmers to grow biodiesel feedstocks through preferential tax breaks were initially unsuccessful and substantial participation by smallholders was only achieved following complementary engagement measures at the local level. Following the implementation of measures such as seed provision, technical support and the involvement of local NGOs in verifying the fairness of contracts, smallholder participation quadrupled between 2008 and 2010 and there was a measurable rise in the reported satisfaction levels (Lima, 2012). This highlights how MBIs need to be combined with local measures tailored to landholder needs and values if they are to create sustainable opportunities that contribute to environmental, social and economic objectives.

#### **4.2 Pathways forward**

To some extent, the tensions that exist between the vision of the UNCCD Strategic Framework 2018-2030 of a future that avoids, minimises, and reverses land degradation within a land degradation-neutral world, and the nature of environmental MBIs are inherent and unable to be fully reconciled, at least not to the satisfaction of all stakeholders. MBIs require a degree of substitutability to function, while land degradation is context-specific and involves a diverse range of impacts on soils, biota and people. However, it is important to note that the environmental MBIs discussed in section 3 already exist and trade-offs are already being made between various ecosystem functions, both explicitly and implicitly. If proponents of LDN do not work with the agencies and institutions operating these schemes, there is a risk that narrowly-focused schemes covering carbon, biodiversity, bioenergy or other factors proliferate while LDN objectives remain overlooked.

Cooperation between proponents of LDN, such as the UNCCD Secretariat, and other policy-makers face a number of challenges and barriers. For example, Akhtar-Schuster et al. (2017) identified a range of challenges related to the definition of LDN and its links to the different mandates of the three Rio Conventions, including determining appropriate measures, scales and baselines, and weighing up the relative importance of different ecosystem services. These challenges impact upon the possible synergies and interactions that can be harnessed between the three Rio Conventions in operationalising the LDN concept. Similar challenges are likely to be encountered in working with policy-makers managing carbon, biodiversity and other MBIs at national and sub-national levels.

Notwithstanding these challenges, the most promising avenues for mainstreaming LDN objectives into existing MBIs based on the analysis presented in this article involve:

- modifications to certification schemes and eligibility rules for offsets, auctions and mandates;
- the development of suitable methodologies, guidance and support for carbon and biodiversity offsets that incorporate LDN objectives;
- the inclusion of LDN objectives in multifunctional indices used in auction-based approaches; and
- the structuring of mandates, tax breaks and feed-in tariffs for bioenergy and other products to preferentially support practices associated with the prevention and reversal of land degradation.

Aside from working with operators of existing MBIs to incorporate land degradation objectives, the UNCCD could develop its own market-based schemes that draw on global experiences with environmental MBIs for carbon, biodiversity, bioenergy and other ecosystem services. Of the options discussed in this article, auction and certification approaches may be the most relevant. LDN-specific offsetting schemes may also be an option in the future, but the 2017 conceptual framework for LDN treats offsetting less as a pathway forward and more as a cautionary tale from which LDN stakeholders can learn (Orr et al., 2017). In contrast, auction and certification approaches could be useful in supporting the LDN fund. For activities that are strategic priorities but are unlikely to turn a profit, such as some of the high-cost initiatives identified through the LDN pilot program (UNCCD, 2017a), an auxiliary fund could be established with a reverse auction used to distribute the funds in a cost-effective manner. Certification could be used for activities that have greater likelihood of turning a profit, to give investors greater certainty that the actions they invest in are likely to meet LDN objectives.

Complementary local-scale measures are required for any use of MBIs to promote LDN. Programs such as the Soil Leadership Academy (SLA), launched as a public-private partnership at in October 2015 offer a starting point for knowledge-building and local-scale support (Safriel, 2017). However, the SLA is yet to have a major impact and concerns have been raised about the risk of transferring Western environmental management approaches to other countries (Grainger, 2015). SLA partnerships with the World Business Council for Sustainable Development and Syngenta were also the focus of demonstrations outside the 11<sup>th</sup> COP of the UNCCD (Namibia Press Agency, 2013). Jomo et al. (2016) calls for internationally accepted guidelines for private sector involvement in the delivery of the SDGs, including uniform accounting and reporting standards. It is crucial that supporting measures used to develop methodologies, share knowledge, provide technical support and certify practices around MBIs and LDN are developed in a manner that recognises local contexts, knowledge, values and interests (Orr et al., 2017), especially as drylands are often the 'last refuges' of local and traditional knowledge (Easdale and Domptail, 2014).

## **5. Concluding remarks**

Capitalising on synergies between LDN and existing environmental MBIs offer a number of potential advantages compared to developing new LDN-specific MBIs. Such an approach avoids the need to develop and manage complex new institutional arrangements. It may

also enable new sources of funding to be brought to bear on land degradation challenges without having to allow restoration in one location to be offset against further degradation in another. Furthermore, such a strategy would recognise that a variety of ecosystem services and functions are already being traded off against carbon, biodiversity and bioenergy objectives under existing MBIs. Working constructively with the agencies and institutions managing such schemes may allow these trade-offs to be made more explicit and for synergistic land management practices to be preferentially supported over those with a more a narrow range of benefits.

In order to better integrate LDN into existing MBIs, the UNCCD and other proponents of LDN will need to gain positions of decision-making or influence over eligibility rules, certification schemes, methodology development, the design of multifunctional indices and the structuring of mandates, tax breaks and feed-in tariffs. Gaining such influence represents a key challenge with such a strategy. Other challenges include the risk that attempts to quantify and value SLM and restoration outcomes end up devaluing other important factors or giving preference to the values of privileged stakeholders over those who are more marginalised. A key challenge inherent to any use of MBIs is the balance that must be struck between having sufficient substitutability to keep a market functioning while recognising the diverse environmental and social outcomes from restoration projects in different contexts. It is up to the Parties and mechanisms of the UNCCD and the broader community of landholders, researchers, practitioners and policy-makers involved in LDN to navigate these future policy pathways in a manner that takes advantage of the opportunities that MBIs provide while integrating the latest scientific evidence, policy experience and local knowledge.

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