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### Agents, assumptions and motivations behind REDD+

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# 5. The Assumed Efficiency of REDD+

## 5.1 Introduction

This chapter contributes to the overall research question regarding the motivations of potential REDD+ agents by analyzing the assumptions of scholars and REDD+ actors regarding the economic efficiency of REDD+. The efficiency of a regime is in essence a dimension of its effectiveness, as it can be defined as a regime's "ability to reach goals at lowest costs" (Vatn and Vedeld, 2013: 425). As the resources available for global climate mitigation are per definition limited, the efficiency of REDD+ influences the overall efficiency and effectiveness of the climate regime (Angelsen, 2008a). There are also potential trade-offs between the effectiveness and efficiency of REDD+ schemes, as schemes that provide cheap, short-term emission reductions might compromise the long-term effectiveness of the climate regime, and between efficiency and equity (see 5.3.2).

The chapter analyzes relevant literature, empirical data and views of REDD+ actors on the costs of the REDD+ scheme and the actual and potential sources of financial support for REDD+. It starts with an analysis of the assumed efficiency of performance-based payments for ecosystem services (PES) and markets for ecosystem services (MES), as these are generally seen as the basis of the REDD+ regime (Alvarado and Wertz-Kanounnikoff, 2007; Angelsen, 2008b; Wertz-Kanounnikoff et al., 2008; Bond et al., 2009; see 5.2). It subsequently analyzes the estimations of the overall costs of REDD+ (5.3.1), including both the opportunity costs (5.3.2) and the transaction costs (5.3.3) and proposed sources of funding (5.4). The discussion addresses the relationship between REDD+ finance and forest cover change (see 5.5) and the implications of the recently adopted Paris Agreement for REDD+ financing (see 5.6).

## 5.2 The Assumed Efficiency of Payments and Markets for Ecosystem Services

Markets in environmental services (MES) represent an environmental economic approach to correct the failure of conventional markets to reflect the true value of ecosystem services (Richards, 2000; Bishop et al., 2010; Farley et al., 2010; Gomez-Baggethun et al., 2010; Leimona et al., 2015).<sup>205</sup> The rationale is that by internalizing the value of environmental services, conservation is made profitable and that this will attract additional funding (Pirard, 2012), while leaving space for actors to choose adequate policies and measures in line with their own economic self-interest (Cock, 2008). The underlying assumption was articulated by Erik Solheim, former Minister of Environment of Norway, who is considered a major agent behind REDD+ (see 5.4): "Tropical deforestation happens because it is more profitable to cut down forests than to look after them" (Bond et al., 2009: iv). In a MES, such services are enclosed, measured and given a market value through a process of commodification that creates new fictitious commodities like 'carbon credits' based on what were often public goods (Reynolds, 2012, Beymer-Farris and Bassett, 2012). As such PES is a reflection of an increasingly popular neoliberal approach

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<sup>205</sup> Ecosystem services can be defined as the services provided by the regulation, habitat, production and information functions of ecosystems (De Groot et al., 2002).

to environmental governance (Humphreys, 2008) and a discourse of ecological modernization and green governmentality (Backstrand and Lovbrand, 2006), where “the virtues and efficiency of economic liberalism are often taken for granted” (Broughton and Pirard, 2011: 3).

REDD+ replaces traditional development cooperation relations between industrialized and developing countries with a more business-like model of selling ecosystem services (Richards, 2000; Wunder and Wertz-Kanounnikoff, 2009). The conditionality of PES is expected to lead to increased delivery of ecosystem services and thus more efficient conservation, and create a win-win situation of long-term conservation and economic development amongst forest-dependent communities (Backstrand and Lovbrand, 2006; Wunder and Alban, 2008; Corbera et al., 2009, Wunder and Wertz-Kanounnikoff, 2009; Ferraro, 2011; Pirard, 2012).

Financial incentive schemes for improved environmental performance started to emerge more than eighty years ago (Cain and Lovejoy, 2004; Gomez-Baggethun et al., 2010). The first carbon-offset project dates from 1988, four years before the UNFCCC was adopted (Faeth et al., 1994) and the “principle that those who benefit from biological resources should pay more of the costs of ensuring that such resources are used sustainably” was already defended by McNeely, then chief scientist with the World Conservation Union (IUCN) in 1990 (McNeely et al., 1990: 14).

PES and other market-based conservation mechanisms grew in popularity due to a broadly shared frustration over the ineffectiveness of traditional command and control approaches to nature conservation, which were considered ineffective as their enforcement was hampered by weak governance, high transaction costs, monitoring and enforcement costs and information gaps (Engel et al., 2008). They were also seen as an alternative to so-called Integrated Conservation and Development Projects (ICDPs) introduced by the World Wide Fund for Nature (WWF) in 1986.<sup>206</sup> Which tried to combine biodiversity conservation with rural development by promoting environmentally friendly income-raising activities for local communities (Wunder, 2006; Engel et al., 2008; Lederer, 2012; Van der Hoff et al., 2015). The assumption behind ICDPs was that such activities would distract communities away from environmentally destructive income-generating activities, but due to their indirect nature some scholars have blamed them for being neither successful from a conservation point of view, nor from a development point of view (Wunder, 2006)

Other assumed advantages of PES include greater flexibility and innovation, more sensitivity to buyer preferences, better access to investment capital (Bishop et al., 2010) and being more targeted than regulations, which tend to be prescribe the same conservation behavior to all potential ES providers (Engel et al., 2008). Communities are assumed to be free to choose whether they participate in PES mechanisms or not, which means that PES would provide them with more autonomy than top-down ICPD schemes (Nelson et al., 2010). However, government-imposed PES mechanisms are not always voluntary and often force citizens to pay for carbon sequestration or other environmental services. Service providers are sometimes forced to participate too, for example, through a decision of their local authorities (Engel et al., 2008).<sup>207</sup>

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<sup>206</sup> See <http://www.wwf.gr/en/wwf-history-en> last visited 20 November 2016.

<sup>207</sup> An example is the Chinese Sloping Land Conversion Program, where the decision to participate in the scheme was often taken by the local authorities, without consultation with the farmers (Bennett, 2008). Similarly, the incentive scheme that was set up by the government of Vietnam

While Fosci (2014) suggests that there is a tendency in the REDD+ regime to prioritize financial incentives over regulatory measures, others have pointed out that national PES mechanisms will only be effective as a REDD+ instrument if accompanied by good governance and proper law enforcement, which requires significant prior investment in national-level governance structures (Richards, 2000; Aune et al., 2004; Wunder, 2007; Börner et al., 2011; Gupta and Sanchez, 2012; Bryan, 2013; Fosci, 2014). Carbon sequestration is an ecosystem service that is difficult to commodify through a national PES scheme without government interference (Wunder and Alban, 2008) so many existing REDD+ strategies combine PES schemes to distribute the payments received amongst individual forest owners, with broader regulatory and policy measures (Agung et al., 2009; Porras et al., 2013). PES can make strict regulations like deforestation bans politically acceptable, while deforestation bans lower the opportunity costs of PES by making deforestation less attractive (Wunder and Alban, 2008; Sommerville et al., 2010; Fosci, 2014), although the ethics of paying compensation for refraining from illegal activities can be questioned (Pirard, 2012). In fact, the REDD+ scheme was partly developed in response to the desire of the PNG Government to be financially rewarded for complying with its own forestry regulations (see 7.2).

As described in Section 4.2.2., accounting for an ecosystem service like carbon sequestration is complicated – estimating the carbon content in trees through different methods can lead to variations of more than 100% and other carbon pools in forests such as bushes and soils are even harder to account for (Pelletier et al., 2012). PES programs on the ground are often based on a dubious scientific foundation and have used highly simplified indicators, proxies and definitions for the ecosystem services they provide (Pagiola, 2008; Wunder and Alban, 2008; Elias 2013; Porras et al., 2013). This sometimes results in PES mechanisms promoting the wrong land use for the ecosystem service they want to generate (Bennett, 2008; Wunder and Alban, 2008; Bryan, 2013).<sup>208</sup> Many PES mechanisms invest in the protection and enhancement of tree cover without scientifically assessing the impacts of these activities on climate change mitigation (Porras et al., 2013). Thus, while REDD+ was clearly designed as an output-based system, which can be defined as a system that focuses on delivering concrete quantifiable (carbon sequestration) results, many national PES mechanisms tend to work as an input-based scheme, providing investments that are not necessarily linked to the results achieved.

Payments promoting the provision of one specific ecosystem service like carbon sequestration also risk depleting other ecosystem services or even the net social value produced by multiple services (Chen et al., 2010; Bryan, 2013). In some cases, different schemes have impacted on the same ecosystem with contradictory results (Bryan, 2013).

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does not allow forest users to opt in or opt out of the scheme, if only because all forests are owned by the State. Most of the payments were lower than the opportunity costs (Wunder et al., 2005).

<sup>208</sup> An example is a reforestation scheme financed with forest carbon offsets in the Ecuadorian Andes, which depleted a natural paramo (highland peat) ecosystem that contained more carbon than the trees that replaced it. Moreover, the planted trees were not permanent, as wood production formed part of the compensation scheme, and many trees withered due to flawed planting techniques and advice. See Wunder and Alban, 2008, and [http://wrm.org.uy/wp-content/uploads/2013/04/Carbon\\_Sink\\_Plantations\\_in\\_the\\_Ecuadorian\\_Andes.pdf](http://wrm.org.uy/wp-content/uploads/2013/04/Carbon_Sink_Plantations_in_the_Ecuadorian_Andes.pdf) (last visited 12 February 2016). Bryan (2013) also concludes that afforestation subsidies on agricultural land reduce carbon sequestration through shortening economically optimal rotation times.

Scholars point at the risk that payments for carbon sequestration may lead to a replacement of natural ecosystems by monoculture tree plantations (Wunder and Alban, 2008; German et al., 2009; Crossman et al., 2011; Leimona et al., 2015; see also 4.4.1), despite positive correlations between the biodiversity, hydrological functions and carbon sequestration functions of natural forests (Wunder and Wertz-Kanounnikoff, 2009). Moreover, there may be limited geographic overlap between the least-cost areas for carbon sequestration and biodiversity hotspots (Siikamaki and Newbold, 2012; Morel and Morel, 2012).

Most PES mechanisms are established, funded and run by governments as PES investment costs and risks are too high for ordinary private actors (Broughton and Pirard, 2011; Vatn et al., 2011).<sup>209</sup> This means that there is only one buyer, so the competitiveness, which is seen as the key factor that makes markets efficient, is absent (Wunder, 2005; Sierra and Russman, 2006; Vatn, 2010; Vatn et al., 2011), while the assumed role-back of the State and greater involvement of private actors in nature conservation that was supposed to trigger increased efficiency does not take place either (Wunder and Alban, 2008; Broughton and Pirard, 2011; Aldy and Stavins, 2012).

PES schemes also suffer from inefficiencies that are common to environmental subsidy schemes because (a) they might offer payments that are too low to halt forest loss; (b) they might offer payments that are too high, as forests would also have been conserved through a lower or even no payment; (c) they might trigger leakage because they do not address the demand for forest products or forest land, so the production practices that trigger forest loss will tend to move from the location where PES are offered to a location where PES is either not offered or not competitive (Engel et al., 2008; Wunder and Wertz-Kanounnikoff, 2009; Garcia-Amado et al., 2011; Ferraro, 2011; see 4.2.4) and (d) they normally require permanent payments for permanent conservation: as soon as payments stop, forests conversion might continue (Engel et al., 2008). This may imply the risk of what has been called “environmental blackmail” (Karsenty et al., 2012), that is, the risk that countries will threaten to allow deforestation if no payments are made.

Several interviewees confirmed that the assumed efficiency of REDD+ that was presented in reports like the Eliasch report (2008) had been an important motivation behind REDD+. <sup>210</sup> Some interviewees highlight that REDD+ was broader than conventional national PES mechanisms, as it has triggered the development of new national policies and laws.<sup>211</sup> Some actors laud the results that had already been achieved through PES pilot projects or national initiatives,<sup>212</sup> like the PES mechanism in Costa Rica that had strengthened the political will for forest conservation.<sup>213</sup> Some actors feel that REDD+ Readiness funding has triggered better forest management, stronger institutions and increased collaboration between different forest-related agencies, which will have a lasting positive effect on forest policy irrespective of future REDD+ funding flows.<sup>214</sup> While the original focus of REDD+ had been on one ecosystem service, carbon, some interviewees highlight that there has been a clear learning curve about the role of biodiversity in climate mitigation and adaptation, and the value of forests in general,<sup>215</sup>

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<sup>209</sup> [http://www.fao.org/forestry/vrd/by/funders#graphs\\_and\\_stats](http://www.fao.org/forestry/vrd/by/funders#graphs_and_stats) (last visited 16 February 2016).

<sup>210</sup> Interview 54, November 2013.

<sup>211</sup> Interview 4, December 2011.

<sup>212</sup> Interview 34, December 2012.

<sup>213</sup> Interview 11, March 2012.

<sup>214</sup> Interview 9, March 2012; interview 18, June 2012; interview 36, December 2012.

<sup>215</sup> Interview 8, December 2011; interview 14, June 2012; interview 21, September 2012.

which means more of the available REDD+ funding is being spent on conservation measures.<sup>216</sup>

Some interviewees welcome the focus on the financial aspects of forest conservation<sup>217</sup> as it would involve key economic players in forest conservation. Some see performance-based payments as a “clean and simple” approach to conservation policy,<sup>218</sup> that could enhance the effectiveness of regimes like the CBD too,<sup>219</sup> as it translates into a more results-based mentality to international support.<sup>220</sup> Some actors welcome the chance to turn forest conservation, rather than products that trigger deforestation like soy or palm oil, into a commodity.<sup>221</sup>

However, other interviewees point out that an ecosystem service is distinct from a commodity<sup>222</sup> and that developing countries have had quite negative experiences with similar commodity markets.<sup>223</sup> Some see REDD+ as an example of a neoliberal approach to environmental governance embraced by countries like the UK that promote the privatization of environmental values and related community rights.<sup>224</sup> While REDD+ had triggered an increased interest of the private sector in forest conservation,<sup>225</sup> there was little trust in their goodwill – it was felt that most actors were mainly working on REDD+ for commercial reasons, in order to generate business based on the climate crisis.<sup>226</sup> One interviewee questioned the assumption that “throwing a lot of money to the South would suddenly halt deforestation.”<sup>227</sup>

Some interviewees said that instead of compensating for opportunity costs governments should establish well-enforced regulations that provided restrictions to economic activities that triggered forest loss as part of an overall low emissions strategy,<sup>228</sup> and that public funding should primarily be used to create an enabling environment for transformative change.<sup>229</sup> This can be defined as:

“a shift in discourse, attitudes, power relations, and deliberate policy and protest action that leads policy formulation and implementation away from business as usual policy approaches that directly or indirectly support deforestation and forest degradation” (Brockhaus and Angelsen, 2012: 16-17, see also Norgaard, 2010).

However, one interviewee stated that few REDD+ countries are interested in receiving investments that trigger transformational change.<sup>230</sup> Other interviewees highlight that REDD+ does not provide the right incentives for transformational change, because it stimulates the concentration of funding, power and visibility in the forest sector. It thus

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<sup>216</sup> Interview 22, September 2012.

<sup>217</sup> Interview 35, December 2012; interview 34, December 2012.

<sup>218</sup> Interview 8, December 2011; interview 21, September 2012; interview 26, September 2012.

<sup>219</sup> Interview 8, December 2011; interview 21, September 2012.

<sup>220</sup> Interview 47, June 2013.

<sup>221</sup> Interview 55, November 2013.

<sup>222</sup> Interview 21, September 2012.

<sup>223</sup> Interview 20, September 2012.

<sup>224</sup> Interview 41, December 2012.

<sup>225</sup> Interview 21, September 2012.

<sup>226</sup> Interview 9, March 2012, interview 42, March 2013.

<sup>227</sup> Interview 33, December 2012.

<sup>228</sup> Interview 16, June 2012.

<sup>229</sup> Interview 32, December 2012.

<sup>230</sup> Interview 36, December 2012.

further empowers the very actors that benefit from business-as-usual and they will be inclined to reject a shift in discourse, attitudes and power relations.<sup>231</sup>

## 5.3 The Estimated Costs of REDD+

### 5.3.1 Overall Cost Estimates

The assumed cost efficiency of REDD+ in comparison to other emission reduction strategies was an important argument behind REDD+ (Richards, 2000; Kindermann et al., 2008; Dutschke and Wertz-Kanounnikoff, 2008; Pirard and Karsenty, 2009; Siikamaki and Newbold, 2012). Especially the reports of Lord Stern (2006) and Swedish business man Johan Eliasch (2008) were influential. The Stern report (2006) claims that REDD+ is one of the least expensive climate mitigation options, and that it would require up to USD 5 billion per year only to reduce global deforestation by half. Eliasch raised that estimation to USD 17-33 billion per year, but argued that that amount could easily be generated by a mandatory forest carbon offset market (Eliasch, 2008; see also Angelsen, 2008a; Karsenty et al., 2012). McKinsey & Company (2009) showed the Marginal Abatement Costs Curve for different climate change mitigation measures and concluded that avoiding deforestation and reforestation were amongst the more cost-efficient measures.<sup>232</sup> However, the McKinsey report itself cautions against the deductive approach that was used, which ignored indirect costs, transaction costs, the intersectoral, intertemporal, behavioral, macroeconomic and international interactions between different measures; the ancillary benefits of certain measures; and wider social implications, which are particularly important for the forest sector (Ekins et al., 2011).

The costs of REDD+ include the opportunity costs of not being able to use forests and forest lands for economic activities that harm them, and the so-called transaction costs of establishing and facilitating the REDD+ policy or project. Scholars warn that the low costs of REDD+ are a false assumption (Coomes et al., 2008; Wang and Lu, 2010; Ferraro, 2011; 2013; Rendón Thompson et al., 2013; Fosci, 2014) and that this assumption that forest conservation in developing countries is cheap is “a legacy of the colonial relationship between the two blocks of the world” that will lead to overly cheap payments being offered by industrialized countries for REDD+ implementation in developing countries (Nuzunda and Mahuve, 2011: 210).

Table 5.1 shows that the cost estimations of REDD+ projects vary significantly, due to the use of different methods, terms, definitions, geographic scope, ecosystem components and yield formats, and assumptions about especially the opportunity costs (Richards and Stokes, 2004; Rendón Thompson et al., 2013). The European Commission has estimated the costs of halving deforestation by 2020 as anywhere between USD 3 billion and USD 250 billion (Bozmoski and Hepburn, 2009).<sup>233</sup> Other estimates of the annual costs to halve forest loss vary from USD 5 billion to USD 39 billion<sup>234</sup> (Fosci,

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<sup>231</sup> Interview 37, December 2012; interview 57, December 2013

<sup>232</sup> Please note that other measures, like energy efficiency measures, were considered to be more efficient than forest-related measures, and some of them have negative abatement costs, that is, these measures pay themselves off (see also Corbera et al., 2010; Ekins et al., 2011).

<sup>233</sup> SEC/2008/2619/2, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52008SC2619&from=en> (last visited 22 February 2016).

<sup>234</sup> These estimates do not take into account transaction costs or private rent.

2013). The costs of reducing forest loss by 100%, in line with the recently adopted SDG 15.2,<sup>235</sup> range from USD 12.2 billion to USD 130 billion per year and continue into infinity (Fosci, 2013). More generic estimations of the costs of SFM worldwide range from USD 31.25 billion in Agenda 21 adopted by the UN Conference on Environment and Development in 1992,<sup>236</sup> to between USD 33 billion and USD 70 billion in a study on forest financing prepared for the UN Forum on Forests (Tomaselli, 2006).<sup>237</sup>

**Table 5.1 Estimated costs of reducing forest loss**

Source	% reduction in forest loss	Lowest estimate in USD per year into infinity	Highest estimate in USD per year into infinity
Agenda 21, 1992	100 (SFM)	31.2 billion	
Stern, 2006	50		5 billion
European Commission, 2008	50	3 billion	250 billion
Eliasch, 2008	50	17 billion	33 billion
Tomaselli, 2008	100 (SFM)	33 billion	70 billion
Fosci, 2013	50	5 billion	39 billion
Fosci, 2013	100	12.2 billion	130 billion

Some national examples are illustrative too. The annual costs of a REDD+ program in Peru conserving 54 million ha of forests are estimated to be between USD 25 – 68 million (Rendón Thompson et al., 2013), while the costs of a REDD+ program in Brazil were estimated to start at USD 73 million per year and climb to USD 530 million per year as lands with higher opportunity costs were targeted (Nepstad et al., 2007).<sup>238</sup>

### 5.3.2 Opportunity Costs

While transaction costs can be significant, the main part of the costs of REDD+ exists of opportunity costs (Rendón Thompson et al., 2013), which can be defined as “the highest forgone profits of not putting the land under an available alternative” (Porrás et al., 2013: 56). Environmental economists argue that deforestation will only be halted if REDD+ payments are higher than the opportunity costs of the activity that they aim to disincentivize (Bond et al., 2009, Dargusch et al., 2010, Karsenty et al., 2012, Borrego and Skutsch, 2014, Fletcher et al., 2016). However, it is difficult to accurately measure opportunity costs – different methodologies to calculate opportunity costs could lead to estimates that range between zero and more than thousand USD per hectare per year for the very same crop in the same country (e.g. Indonesian pulp, Pirard, 2012). Opportunity costs can only be estimated in relation to a certain business-as-usual scenario (Pirard, 2012) and the adequate calculation of such a business-as-usual scenario forms a significant

<sup>235</sup> Transforming our World: the 2030 agenda for Sustainable Development. A/RES/70/1. See [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&referer=/english/&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&referer=/english/&Lang=E) (last visited 16 July 2016).

<sup>236</sup> <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf> (last visited 12 February 2016).

<sup>237</sup> In comparison, James et al. (2001) estimated a comprehensive global biodiversity conservation program would cost approximately USD 317 billion per year.

<sup>238</sup> This estimation excludes the 6% deforestation that takes place on the lands with the highest opportunity costs.

challenge (see 4.2.3), also because alternative employment might not always be available (Bottazzi et al., 2013).

The concept of opportunity costs is useful to identify REDD+ projects with relatively low costs (Wunder and Alban, 2008). The opportunity costs of REDD+ are location- and region-specific (Dutschke, 2010; Kuik, 2013), as they depend on factors like the suitability of the area for commodity production, infrastructure, and whether the relevant country is attractive for foreign investment (Chen et al., 2010; Karsenty et al., 2012). The opportunity costs of REDD+ are lowest in projects that address small-scale, relatively unprofitable or extensive activities that trigger forest loss, including small-scale subsistence farming, cattle farming and shifting cultivation (Olsen and Bishop, 2009, Cenamo and Carrero, 2012, Rendón Thompson et al., 2013). Poor landowners often lack the investment capacity in terms of labor and capital to clear large forest areas, and the estimated marginal clearing capacity of small landowners is around 0.5 ha per year only (Wunder and Alban, 2008). Therefore, REDD+ is likely to be most cost-efficient in forests that are primarily threatened with forest degradation by smallholders (Dutschke and Wertz-Kanounnikoff, 2008, see also Wunder, 2007).

Deforestation is dominated by small-scale processes in Africa, and infrastructure in many African countries is less developed than in Asia and Latin America, which means that opportunity costs are relatively low (Boucher et al., 2011). However, low costs do not necessarily imply high efficiency, as these areas and countries often need significant investment in terms of capacity-building, governance reform and other transaction costs and PES payments for landowners in Africa are complicated as most forests are formally State property, regardless of customary land tenure arrangements (White and Martin, 2002).

More importantly, overall deforestation rates and related emissions in Africa are still much lower than deforestation rates in Asia, and especially Latin America (Boucher, et al., 2011; FAO, 2015). Small-scale activities are only minor drivers of forest loss (see 4.5), while it would require an exorbitant amount of funding to compensate for the opportunity costs of the main drivers of forest loss, i.e. commercial agricultural crops like soy bean and oil palm (Fry, 2008; Campbell, 2009; Boucher et al., 2011, McElwee, 2011; Gupta and Sanchez, 2012; Kissinger et al., 2012; Karsenty et al., 2012; Porras et al., 2013; McDermott, 2014; Leimona et al., 2015). The overall commercial earnings of these export crops “dwarf” the funding that is currently available for REDD+ (Boucher, 2015: 556). The full opportunity costs of preserving the remaining Brazilian Amazon forest is estimated at USD 257 billion (Nepstad et al, 2007), which means that it seems “an unrealistic goal” to try to achieve zero deforestation in this area through PES-based REDD+ (Börner and Wunder, 2008: 509). Even the opportunity costs of conventional logging and smallholder-intensive agroforestry are assumed to be too high to be compensated for with REDD+ payments (Smith and Applegate, 2004; Campbell, 2009). Paradoxically, due to the nature of the concept of opportunity cost, REDD+ is most efficient in the continents and areas with the lowest deforestation rates.<sup>239</sup>

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<sup>239</sup> In fact, only the activities that were found in the middle of the McKinsey marginal abatement cost curve (MACC) for GHG are suitable for PES mechanisms from an efficiency perspective – the ones that have higher abatement costs will be too expensive to compensate for, while the ones that have negative abatement costs do not require compensation in the first place (Grubb et al., 2011).

**Table 5.2 Opportunity costs of different commodities in Brazil and Indonesia**

Commodity	Opportunity costs/ha	Source
Oil palm	USD 4,678 – USD 9,000	Kissinger et al., 2012; Irawan et al., 2013
Timber followed by cattle ranching and soybeans	USD 2,215 – USD 3,465	Olsen and Bishop, 2009
Tree plantations	USD 2,378	Olsen and Bishop, 2009
Coffee/bandarra	USD 2,172	Olsen and Bishop, 2009
Timber	USD 1,435	Olsen and Bishop, 2009
Soybean	USD 1,027 – USD 1,924	Olsen and Bishop, 2009
Coffee/rubber	USD 969	Olsen and Bishop, 2009

Even if sufficient finance would be available to compensate both small-scale activities by relatively poor users and wealthy export-oriented producers, it would not be economically efficient to pay both types of land users the same compensation. Discriminative payments, that is, payments that provide more compensation for forest owners with high opportunity costs than for forest owners with low opportunity costs could be up to ten times more efficient than flat payments (Chen et al., 2010; see also Wunder and Alban, 2008; Börner et al., 2010). Yet, a differentiated compensation can raise equity-related questions, as it would primarily benefit wealthy landowners, or countries, which are able to exploit their land in a more profitable manner (Ekins et al., 2011; Gupta and Sanchez, 2012). That is why many government-run PES mechanisms use a flat rate, in which every land owner is compensated the same fee per hectare regardless of his or her opportunity costs. This also makes it easier to administer PES mechanisms thus lowering transaction costs (Broughton and Pirard, 2011; Vatn and Vedeld, 2011; Mertz et al., 2012; Skutsch et al., 2013). However, flat payments for differentiated opportunity costs may also raise equity questions (Sanchez-Azofeifa et al., 2007; Chen et al., 2010).

Opportunity costs are unstable, being influenced by social and economic factors, technological changes and market forces (Potvin et al., 2008; Karsenty, 2008; Bond et al., 2009; Gregersen et al., 2010; Ekins et al., 2011; Matthews et al., 2014). These include commodity prices that might not only be influenced by other climate change mitigation actions like stimulating bioenergy demand, but also by the REDD+ actions themselves, as land, and some commodities, might get scarcer (Kaimowitz, 2008; Kindermann et al., 2008; Ekins et al., 2011; Karsenty et al., 2012). This may trigger transnational leakage effects (Morel and Morel, 2012). Likewise, local actors could use REDD+ payments to invest in technologies that make the production of crops like cocoa more profitable, thus raising the opportunity costs and providing poor landowners with the necessary capital to exploit areas that were previously unthreatened (Sierra and Russman, 2006; Campbell, 2009).

Market speculation could imply that payments might end up in the hands of people who were not planning to deforest (McKinsey & Company, 2009). REDD+ and other PES are efficient only if the activities they pay for are additional to what would have happened in the absence of the payment. Yet, as explained in 4.2.3, additionality is difficult to assess, as deforestation is influenced by economic, political, cultural and even natural variables (Karsenty 2008; Börner and Wunder, 2008; Karsenty et al., 2012). Setting so-called business-as-usual scenarios boils down to setting “random” scenarios (Karsenty, 2008: 446) as it is hard to distinguish between deliberate emission reductions and emission reductions that result from natural or other circumstances beyond the influence of the actor that received the REDD+ payment (Karsenty, 2009).

Especially the significant expenses on certain national PES programs can be questioned in light of the absence of additionality. For example, there is little to no evidence that the USD 150 million that was spent on the Costa Rican PES mechanism between 1996 and 2009 actually led to significantly reduced deforestation, annually or cumulatively. An important reason was that landowners could voluntarily apply for PES, and it was far more attractive for landowners who had no intention to deforest because their land was not suitable for agricultural production, because they did not depend on exploitation of their land for their income, because deforestation was illegal since 1996, or because they had traditional value systems that did not support deforestation, to apply for such payments (Sierra and Russman, 2006; Sanchez-Azofeifa et al., 2007; Andam et al., 2008; Pagiola, 2008; Pfaff et al., 2008; Arriagada et al., 2009; Daniels et al., 2010; Vatn et al., 2011; Porras et al., 2013).<sup>240</sup>

A proper analysis of the incentives a REDD+ scheme might provide should also take into account the differentiated opportunity costs of different actors, including the opportunity costs of different levels and agencies within a Government. In countries where corruption is a major problem a proper application of REDD+ schemes requires a strategic analysis of the individual opportunity costs of different government officials, as it is unlikely that REDD+ will bring any change if the individual opportunity costs of key officials are higher than the compensation offered (Karsenty and Ongolo, 2011). However, needless to say, it is quite complicated to incorporate compensation payments for corrupt government officials in a REDD+ scheme. For that reason, most authors suggest that solving corruption and improving governance in general, including land tenure, is a precondition for REDD+ (Richards, 2000, Aune et al., 2004, Wunder, 2007, Bryan, 2013). Yet, while this suggestion is undeniably true, it also seems rather detached from the reality in most developing countries as there are no indications that their problems with illegality, corruption and unclear land tenure arrangements will be solved in the near future, while most countries are already well under way developing REDD+ schemes.

Lastly, the empirical value of the opportunity cost estimates of REDD+ are limited as REDD+ is overwhelmingly financed through donor contributions, so actual payments result from negotiations between donor and recipient countries (Pirard and Karsenty, 2009). As explained in Section 4.2.3, the REDD+ regime established by the UNFCCC allows countries to determine their own baseline and additionality according to a self-chosen methodology.<sup>241</sup> Hence, some countries are strategically applying “development adjustment factors” that allow them to claim that they would face significant deforestation in a business-as-usual scenario, even though there are no historical patterns of deforestation or other indications of future deforestation in the relevant country or area (Karsenty, 2008: 447; see also Alvarado and Wertz-Kanounnikoff, 2007; Andam et al.,

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<sup>240</sup> Please note that Daniels (2010) does find some positive impacts at the sub-national level although the main positive impact was through forest regeneration rather than halting deforestation.

<sup>241</sup> The only requirement is that the methodology chosen is well-argued and that it “might” be subject to a technical assessment, the objective of which is to offer a “facilitative, non-intrusive, technical exchange of information” see FCCC/CP/2013/10/Add.1, <http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf#page=34> (last visited 22 February 2016).

2008; Karsenty et al., 2012).<sup>242</sup> REDD+ might even incentivize deforestation as payments will only be made if the forests are considered threatened (Wunder and Alban, 2008).

### 5.3.3 Transaction Costs

REDD+ transaction costs include the costs of MRV of the benefits of REDD+ schemes, the costs of marketing these benefits, the costs of measures to prevent leakage and ensure permanence, and implementation costs such as capacity building, enforcement and administrative costs (Kindermann et al., 2008; Borrego and Skutsch, 2014; Fosci, 2014). These transaction costs could also be prohibitively high (Aune et al., 2004), even though they can become more “manageable” (Wunder and Wertz-Kanounnikoff, 2009: 580) once the mechanism is established. It has been estimated that an average of USD 100 million per country would be needed to enable effective participation in a REDD+ scheme (Eliasch, 2008). This includes developing strategies, investing in new institutions, data collection and management, developing an adequate monitoring system, and calculating a national reference emission level (Dutschke and Wertz-Kanounnikoff, 2008). Transaction cost estimates per hectare for REDD+ projects vary from USD 0.73 to USD 90 (Potvin et al., 2008; Porras et al., 2013; Rendón Thompson et al., 2013; Matthews et al., 2014) and could increase to 70-110% of the total payment offered (Vatn, 2010).

The fixed-cost element in transaction costs is relatively higher for small-scale projects, while the economies of scale of larger government-financed PES mechanisms lead to lower transaction costs, especially if they use flat rates and simplified indicators for ecosystem services like forest cover (Engel et al., 2008; Bond et al., 2009; Vatn et al., 2011). It has been argued that the absence of fixed rules for voluntary carbon offset markets reduces the transaction costs of voluntary offset projects (Benessaiah, 2012). Yet, identifying potential MES opportunities and capitalizing on them requires strong technical capacities (Bishop et al., 2010), which are often absent with REDD+ providers.

Transaction costs require significant investments, which might surpass the capacity of potential REDD+ countries or other providers (Dutschke and Wertz-Kanounnikoff, 2008; Van Kooten, 2009; Corbera et al., 2010; Dargusch et al., 2010; Norgaard, 2010). The costs of measuring carbon stored in biomass tend to be inversely proportional to the size of the project, particularly if root biomass, soil biomass and the necromass pool (dead wood and litter) are taken into account, which can represent 40% of the above-ground forest carbon stocks (Gibbs et al., 2007; Neeff et al., 2014). This works to the disadvantage of small heterogeneous projects (Chomitz, 2002; Cacho et al., 2004; Shvidenko et al., 2011).<sup>243</sup> There is a clear trade-off between accuracy and efficiency (Cacho et al., 2004; Dargusch et al., 2010) and reduced accuracy might compromise the effectiveness of the REDD+ regime (see 4.2.2) for example by favoring forestry policies that deplete soil biomass and necromass.

Rules and standards have been developed to guarantee a minimum level of accuracy for both national REDD+ schemes and forest carbon offset projects, but project-related standards change often, creating significant uncertainties (Zhu et al., 2010). Outside

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<sup>242</sup> Similar strategic behavior has been found with CDM projects, or other carbon trading schemes like the ETS (Humphreys, 2008; Brown, 2010) and in the voluntary forest carbon offset market, where consultants creatively calculate assumed threats to forests, and thus the additionality of their REDD+ project (Stephan and Paterson, 2012).

<sup>243</sup> Accurately measuring soil carbon, for example, requires laboratory studies that can cost up to USD 20 per sample (Cacho et al., 2004).

support can be helpful, but the costs of the technical support provided by intermediary actors can add significantly to the overall costs of REDD+ (Hajek et al., 2011) and represent up to 40% of the total project investment (Fosci, 2014). As predicted in 2000, “a major new service industry in the measurement and certification of carbon offsets” has been established, and there is “a temptation to indulge in marginal practices or creative carbon accounting” (Richards, 2000: 1008) since there are economic incentives for both governments and private actors to engage in creative carbon accounting (Karsenty et al., 2012).

To redirect more of the financial flows for REDD+ to local communities and engage them more actively in the projects, community-based monitoring systems have been proposed (Skutsch et al., 2009; Zhu et al., 2010; Palmer, 2011). Empowering communities to manage their own REDD+ projects can lower transaction costs (Skutsch et al., 2009; Villamor and Lasco, 2009), but community-based monitoring systems require significant labor investments and the transaction costs of projects targeting communities without formal land rights can be significant (Gregersen et al., 2010).

While some interviewees argued that the financial crisis in REDD+ had made people aware that much could be achieved in terms of forest conservation without significant funding,<sup>244</sup> most were concerned about the costs of REDD+. A number of interviewees stated that the real costs of REDD+, including the transaction costs,<sup>245</sup> are much higher than the abatement costs that were reflected in the Stern (2006) and McKinsey & Company (2009) reports,<sup>246</sup> although others felt that the monitoring costs were manageable as their country could use existing technologies.<sup>247</sup> Some actors pointed out that there were no proper estimations of the costs of REDD+ Readiness or REDD+ itself by funders like the World Bank, and as a result the investments were far too modest.<sup>248</sup> For example, it was estimated that REDD+ in Indonesia would require between USD 8 and 9 billion a year, but the country has received less than USD 200 million in total (see 5.3.4).<sup>249</sup>

Some actors pointed out that the establishment of the REDD+ scheme had been far more complicated than expected,<sup>250</sup> and that the overwhelming majority of REDD+ funding had been spent on meetings, discussions, consultancies and other Readiness activities. They said that they were “astonished” by the lack of efficiency of the REDD+ process, as so many meetings were needed to develop the scheme. Some communities complained that they had already been forced to organize six general assemblies, while not a penny for REDD+ itself had been received so far.<sup>251</sup> Some interviewees criticized the role of intermediaries, in particular the consultancy sector,<sup>252</sup> and deplored that much of the

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<sup>244</sup> Interview 54, November 2013.

<sup>245</sup> Interview 18, June 2012; interview 25, September 2012; interview 27, October, 2012; interview 40, December 2012.

<sup>246</sup> Interview 19, September 2012.

<sup>247</sup> Interview 47, June 2013.

<sup>248</sup> Interview 36, December 2012.

<sup>249</sup> Interview 26, September 2012.

<sup>250</sup> Interview 18, June 2012.

<sup>251</sup> Interview 35, December 2012.

<sup>252</sup> Interview 16, June 2012; interview 25, September 2012; interview 46, June 2013.

Readiness funding had been invested into consultancies,<sup>253</sup> also because many developing countries did not have the capacity to design their own Readiness plans.<sup>254</sup>

Some pointed out that carbon offset markets will per definition be inefficient as there is a large gap between the real costs of projects and the price at which carbon is being sold, creating significant empty rents.<sup>255</sup> Moreover, some interviewees pointed out that in some countries local authorities had established PES programs that were far too generous, which meant that there was not enough funding, and not all landowners could be compensated. This also created problems for the federal government, as they had established their own national PES scheme, but with much lower payments, causing people to complain.<sup>256</sup>

Some interviewees cautioned that the permanence of REDD+ is dependent upon permanent payments, so once funding runs out forest conservation initiatives might be reversed,<sup>257</sup> and it was feared that not all donors were aware of this risk.<sup>258</sup> They stated that some African countries had already warned that they would discontinue conservation efforts if funds would no longer be provided.<sup>259</sup>

Some interviewees also warned about the potential to manipulate baselines and reference levels.<sup>260</sup> REDD+ was not considered efficient at all as the strong focus on money had created a business mentality, even amongst communities, in which they first asked how much funding would be provided before they were willing to collaborate in forest conservation initiatives.<sup>261</sup> In fact, some suggested that REDD+ had been deliberately designed in such a way that it would be unable to tackle drivers of forest loss with high opportunity costs, so that business-as-usual could continue.<sup>262</sup> Others added cynically that this meant that REDD+ had been pretty efficient in terms of delivering what its main agents wanted it to deliver: business-as-usual.<sup>263</sup>

## 5.4 Sources of Funding

The success of REDD+ depends on how substantial the funds available to compensate reduced forest loss will be (Peterson et al., 2012). PES prescribes that payments will have to be permanent if the ecosystem service is to be provided on a permanent basis which implies that a continuous flow of funding is required (Sohngen and Mendelsohn, 2003; Wunder, 2007; Engel et al., 2008; Liu et al., 2008; Wunder and Alban, 2008; Wang and Lu, 2010). There is evidence of environmentally beneficial practices being discontinued after the PES contract period ends, or when the opportunity costs suddenly increase without being matched by increased compensation (Cain and Lovejoy, 2004; Pagiola, 2008; Corbera

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<sup>253</sup> Interview 41, December 2012.

<sup>254</sup> Interview 26, September 2012.

<sup>255</sup> Interview 38, December 2012.

<sup>256</sup> Interview 31, December 2012.

<sup>257</sup> Interview 8, December 2011; interview 14, June 2012; interview 20, September 2012; interview 26, September 2012; interview 43, June 2013.

<sup>258</sup> Interview 26, September 2012.

<sup>259</sup> Interview 26, September 2012.

<sup>260</sup> Interview 58, January 2014.

<sup>261</sup> Interview 61, January 2015.

<sup>262</sup> Interview 62, May 2015, interview 63, June 2015.

<sup>263</sup> Interview 57, December 2013.

et al., 2009).<sup>264</sup> Temporary crediting and liability rules could address the non-permanence of REDD+ schemes (Karsenty, 2008; Gupta et al., 2013; see also 4.3.3), but do not address the need for permanent funding if REDD+ is to deliver permanent results.

Mobilizing sufficient funding for REDD+, and on a permanent basis, has turned out to be an unsurmountable problem.<sup>265</sup> PES has been promoted as a market-based, user-financed conservation mechanism between voluntary buyers and sellers of ecosystem services (Wunder, 2005; Broughton and Pirard, 2011) but in reality 97% of all PES mechanisms are financed by governments (Bennett, 2008; Engel et al., 2008; Reynolds, 2012; Vatn et al., 2011). Until the UNFCCC COP in 2009 in Copenhagen, which was expected to adopt a legally binding successor to the Kyoto Protocol, many actors believed that global carbon markets could potentially mobilize far more funding for REDD+ than public funds (Angelsen, 2008a; Dutschke and Wertz-Kanounnikoff, 2008; Johns et al., 2008; Swickard and Carnahan, 2010; Gupta and Sanchez, 2012). Forest carbon offset credits were originally relatively popular in the voluntary carbon offset markets (Hunt and Baum, 2009; Peters-Stanley et al., 2011), due to the story behind forest carbon offset projects, which sounded attractive to commercial offset buyers from a green marketing perspective (Richards, 2000; Hovani and Fotos, 2007; Koellner et al., 2008; Hunt and Baum, 2009; Zhu et al., 2010; Peters-Stanley et al., 2011; Vatn and Vedeld, 2011; Stephan and Paterson, 2012). Some of the controversies around REDD+ forest carbon offset projects were being scrutinized by critical NGOs, which led some project developers to show the positive co-benefits of their projects and develop a multitude of voluntary standards and certification systems while excluding, for example, genetically modified trees (Graichen, 2005; Peters-Stanley et al., 2011).

The relative popularity of REDD+ on voluntary carbon offset markets in 2010 was also due to the significant amounts of public funding for REDD+ pledged around that time creating confidence in the offset market (Peters-Stanley et al., 2011). This created expectations amongst governments that most of the costs of REDD+ would, in the end, be borne by the private sector. However, carbon markets have not exactly provided a stable and sustainable financial flow (Redford and Adams, 2009; Wang and Lu, 2010; Zaballa Romero et al., 2013). Rather, they have been described as “a bumpy ride” (Peters-Stanley et al., 2011, iii) with price differences between USD one and 20 (Stephan and Paterson, 2012). Some authors calculate the costs of REDD+ based on a carbon price (e.g. Irawan et al., 2013), assuming an unlimited demand for REDD+ credits. However, as in

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<sup>264</sup> The only exceptions are schemes that lack additionality, or reforestation schemes that allow landowners to profit from complementary wood extraction, which means that the landowners have an additional economic incentive to maintain the forest (Pagiola, 2008; Wunder and Alban, 2008). However, the permanence of such reforestation schemes in terms of carbon sequestration is compromised by wood extraction.

<sup>265</sup> Similar problems have occurred with financing national PES schemes. The PES mechanism in Costa Rica, for example, which was primarily financed through an ecotax on fuels and loans and grants from the World Bank and the GEF (Richards, 2000; Pagiola, 2008; Porras et al., 2013), is significantly underfunded, with almost three times more applicants for PES than the government can afford to pay (Wunder, 2006; Porras et al., 2013). The private sector contributed less than 3% to the costs of the scheme and the attempts of the government to sell the carbon on the international offset market failed as the average Costa Rican price for carbon credits (USD 8) was almost twice the average price on the global market (USD 4.6) (Porras et al., 2013). Another example is Mexico, which spent USD 100 million on its national PES mechanism in 2008 even though the additionality of much of the forest conservation compensated through the scheme was questionable (Kaimowitz, 2008, see 5.3.2).

any market, demand and supply have to be balanced, and a major challenge of market-based REDD+ is that the potential supply of forest carbon offset credits is significantly larger than the past and actual demand for REDD+ credits (Richards, 2000; Fry, 2008). Forests on private lands in the Brazilian States of Amazonas and Mato Grosso alone could dump up to 47 Mt of CO<sub>2</sub>/year on the world's carbon markets (Börner and Wunder, 2008). Approaches like the so-called “nested approach” risk blowing even more so-called *hot air* in the system (see 4.3.2), as it allows project developers to claim carbon credits even when national deforestation levels are increasing (Karsenty et al., 2012).

The fear of REDD+ credits flooding the markets motivated the European Commission's decision to exclude forest carbon offsets from the Emission Trading Scheme (ETS), the largest mandatory carbon trading scheme in the world (Karsenty, 2008; Bozmoski and Hepburn, 2009; Dargusch et al., 2010; Bryan, 2013; Zaballa Romero et al., 2013).

Several developing countries share the concerns about oversupply potentially lowering the market price of carbon (Fry, 2008; Bozmoski and Hepburn, 2009). Proponents of market funding for REDD+ have always argued that significantly higher emission reduction targets are necessary to ensure sufficient demand for REDD+ credits (Alvarado and Wertz-Kanounnikoff, 2007; Dutschke, 2010; Karsenty et al., 2012). However, the rather lenient rules for establishing national baselines and emission reference levels that the UNFCCC COP adopted in 2013 risk producing an overload of, partly questionable, REDD+ credits, as already cautioned in the early years of REDD+ (Humphreys, 2008; Karsenty et al., 2012). A REDD+ offset market will not function without sharply increased and legally binding emission reduction targets, as there will be little interest in carbon offset credits if there is no obligation to further reduce emissions in the first place (Alvarado and Wertz-Kanounnikoff, 2007; Karsenty, 2008; Dutschke and Wertz-Kanounnikoff, 2008; Neeff and Ascuí, 2009; Stephan and Paterson, 2012). Yet, the emission targets adopted by Parties to the UNFCCC so far are modest, and it is as yet highly uncertain whether the pledge and review system that was established by the Paris Agreement<sup>266</sup> will lead to sharper emission cuts. REDD+ will thus face a large funding gap until at least 2020 (Fosci, 2013) and probably thereafter unless the targets are significantly improved and become part of a legally binding regime. As a result, less than 1% of all CDM projects are forest related (Gupta and Sanchez, 2012).

Furthermore, while public REDD+ funding was not equitably divided between countries and continents (Simula, 2011), private funding was definitely biased toward Latin America, where 81% of all REDD+ credits on the voluntary forest carbon offset market in 2010 were sold. Even those projects had a hard time taking off: only one of the twelve projects studied in the Peruvian Amazon in 2011 had actually been able to sell any REDD+ credits at that time (Hajek et al., 2011).

By 2016 that situation has hardly improved and, as Fletcher et al. (2016) state, there is a growing graveyard of expectations leading to increasing disillusion and resentment amongst communities and others being approached for REDD+ projects. Of the 23 REDD+ initiatives studied by Sunderlin et al. (2016) only 17 were still operating by 2015 and only four had begun to sell forest carbon credits. Six projects had ceased operation and five were uncertain as to whether they would continue to function as REDD+ initiatives,

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<sup>266</sup> FCCC/CP/2015/10/Add.1,

[http://unfccc.int/files/home/application/pdf/paris\\_agreement.pdf](http://unfccc.int/files/home/application/pdf/paris_agreement.pdf) (last visited 22 February 2016).

mostly because of insecure land tenure and “the disadvantageous economics of REDD+...” (Sunderlin et al., 2016: 8).

As a result, the private sector continues to play a marginal role in REDD+ financing and even forest carbon offset projects are often established by governments (Corbera and Brown, 2008; Zaballa Romero et al., 2013). Only 10% of the more than 500 REDD+ projects that were developed between 2006 and 2014 were financed through the voluntary market (Fletcher et al., 2016; Sunderlin et al., 2016), also due to the relatively high price and temporary nature of forest-related carbon credits, the high financial risk, the need for large upfront investments and the relatively long pay-off time, especially when it concerns reforestation and afforestation projects.

An inherent challenge to results-based REDD+ payments is that funds would normally be paid *ex post*, that is, after the results have been achieved (Neeff et al., 2014). This means developing countries will have to make significant investments in setting up the policies and mechanisms needed to achieve these results. This could be addressed through *ex ante* payments, but as payments are supposed to be linked to demonstrable results, the concept of *ex ante* payments triggers quite some practical and legal complications. Will *ex ante* payments be returned if results are not achieved? (Neeff et al., 2014).

It was always recognized that a significant part of the transaction costs for setting up REDD+ schemes and projects and making countries *ready* for REDD+ would not be covered by the market, but through grants, concessional loans, technical support and other typical ODA instruments (Johns et al., 2008; Neeff et al., 2014). Already in 2008, when donor support for REDD+ was still building up, approximately two-thirds of all REDD+ activities were financed through ODA. This was despite formal objections from some developing countries against the use of ODA for REDD+ as this is considered a violation of the commitment to provide new and additional financial resources for global environmental commitments (Wertz-Kanounnikoff and Kongphan-apirak, 2008; Gupta and van der Grijp, 2010; Zadek, 2011).

Until 2015, an average of about USD 500 million per year had been pledged for REDD+ by public donors (Matthews et al., 2014; Fletcher et al., 2016; Sunderlin et al., 2016). In comparison, total investment into the global forest-based sector was estimated to be around USD 64 billion per year (Tomaselli, 2006). Moreover, there is a significant gap between the funds that were pledged or disbursed to intermediaries like the World Bank or UN-REDD<sup>267</sup> and funds that are actually being spent on REDD+ in the recipient countries.<sup>268</sup> The capacity of countries to disburse and absorb funds often lags behind significantly as compared to the capacity of donor countries to make, often informal, pledges, also because disbursement requires concrete investible entities in the form of actors capable to reduce deforestation (Karsenty et al., 2012).

Meanwhile, public REDD+ funding pledges actually decreased after 2010 (Sunderlin et al., 2016). While the Paris Summit gave some new impetus, amongst others with the announcement of a “collective aim” of providing USD 5 billion for REDD+ between 2015 and 2020 (so approximately USD 1 billion per year) by Norway, Germany

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<sup>267</sup> The UN Program on Reducing Emissions from Deforestation and Forest Degradation.

<sup>268</sup> For example, by December 2014, the FIP had only spent USD 314 million of the USD 667 million it had received from its donors. See <http://www.climateinvestmentfunds.org/cif/content/delivering-scale-empowering-transformation> (last visited 25 December 2016).

and the UK,<sup>269</sup> the future financial perspectives for REDD+ are uncertain. No country-specific legally binding commitments were made in Paris to provide financial support to REDD+ or climate change mitigation in general (Fletcher et al., 2016; Bodle et al., 2016). The UNFCCC COP decisions adopted in 2010 ask for “scaled up, new, additional, adequate and predictable financial resources”,<sup>270</sup> and in the Decision that supported the Paris Agreement of December 2015 industrialized countries reiterated their intention to provide financial resources and committed to set a quantified collective goal before 2025 “from a floor of USD 100 billion per year”.<sup>271</sup> However, they did not commit to any further specific targets or timelines, so there is no firm commitment as to when this target will be realized, from what sources, and by which donor countries.

Moreover, funding needs to come from a certain source that could also have been used for an alternative purpose (Pirard, 2012). With ODA reaching a little over 137 billion USD in 2014,<sup>272</sup> about 0.36% of global ODA has been spent on REDD+ in the past years. If this sum would increase to the amounts required according to the aspirations of some REDD+ advocates (see Table 5.1; see also Zadek, 2011), it would result in using up to 100% of all ODA for REDD+ (Stephenson, 2011).

Some of the interviewees welcomed the fact that the emphasis of the Stern report on REDD+ as a potentially cheap climate mitigation measure had brought a lot of political attention and goodwill for forest conservation policies.<sup>273</sup> It was pointed out that thanks to the perspective of future carbon markets, and the political weight of the climate regime itself, REDD+ had mobilized millions for forest conservation, even though the markets themselves have always remained weak.<sup>274</sup> Some were quite optimistic about future funding and suggested that especially the Green Climate Fund would attract significant donor support, once it was up and running.<sup>275</sup> A number of interviewees were hopeful that once recipient countries had been able to establish good governance structures, donors would be willing to significantly increase their REDD+ funding.<sup>276</sup> Countries like the UK, Germany, France and Australia had already increased their forest budgets as a result of REDD+.<sup>277</sup> Moreover, it was suggested that many countries were able to finance their own forest conservation policies, and that some countries had already set up more effective conservation policies as a result of increased awareness,<sup>278</sup> so it was not necessary to provide REDD+ funding to them anymore.

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<sup>269</sup> <http://www.norway.ph/news/Events/Germany-Norway-and-the-United-Kingdom-pledge-5-billion-to-support-forests-as-an-essential-climate-solution/#.VrTp4sc-Dv1> (last visited 5 Feb 2016).

<sup>270</sup> FCCC/CP/2010/7/Add.1, <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf> (last visited 22 February 2016).

<sup>271</sup> Decision 1/CP.21 in FCCC/CP/2015/10/Add.1, <http://unfccc.int/files/home/application/pdf/decision1cp21.pdf> (last visited 22 February 2016).

<sup>272</sup> See <http://www.oecd.org/investment/stats/data.htm>, last visited 12 July 2016.

<sup>273</sup> Interview 8, December 2011, interview 16, June 2012, interview 53, October 2013.

<sup>274</sup> Interview 16, June, 2012; interview 18, June 2012; interview 21, September 2012; interview 22, September 2012; interview 23, September 2012; interview 34, December 2012; interview 50, June 2013; interview 54, November 2013.

<sup>275</sup> Interview 48, June 2013.

<sup>276</sup> Interview 36, December 2012.

<sup>277</sup> Interview 22, September 2012.

<sup>278</sup> Interview 54, November 2013.

However other interviewees cautioned that up to 60% of the funding provided to REDD+ was existing ODA, including existing ODA for the forestry sector (which did not necessarily contribute to forest conservation).<sup>279</sup> Some interviewees pointed out that most of the REDD+ funding in their country consisted of a deviation of existing funding for existing forest programs, comparing REDD+ to a “Mad Hatter’s tea party”.<sup>280</sup> They pointed out that administrations of some of the main donor countries had wanted to show leadership and provide climate finance, but their legislative powers were blocking an increase in the overall budget for foreign support. Therefore, REDD+ funding had to come from existing sources, which meant well-working forest conservation programs were now deprived of funding to free up support for REDD+, while only a few countries really benefited from REDD+.<sup>281</sup> Similarly, some interviewees highlighted that a lot of funding that was labeled as REDD+ concerned old and existing funding commitments under other Conventions, describing the situation as “avoided finance for avoided deforestation”.<sup>282</sup> Those existing commitments include contributions to the GEF that are based on the same principle of providing funding for the incremental costs of actions that provide global benefits, yet with a broader conservation perspective that does not require the exact estimation of emission reductions (see also Forner et al., 2006; Engel et al., 2008; Farley et al., 2010; Moreno et al, 2015).

While some cautioned that public funding can be unstable,<sup>283</sup> and that project financing had often been suddenly discontinued as a result of political changes in donor countries,<sup>284</sup> others felt it was better to see private sector investments through voluntary or (potential) mandatory forest carbon offset markets as the “icing on the cake” of more strategic forest conservation strategies.<sup>285</sup> Some actors emphasized that carbon markets are quite volatile,<sup>286</sup> which had impacted on the efficiency of REDD+, as many private actors considered it too risky to invest in.<sup>287</sup> Quite some interviewees were aware that a REDD+ offset market would not generate significant funding without sharply increased and legally binding emission reduction targets, and that there might be a significant backlash if funds turned out to be disappointing.<sup>288</sup> The expectation had been that carbon market finance would create more independence for recipient countries, but many actors felt that these expectations had not been realized.<sup>289</sup> Some interviewees cited examples of high profile REDD+ projects like the Juma project in Brazil that had never sold a carbon credit in reality.<sup>290</sup> It was stated that “(w)e have not been well-served by the idea that there is money

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<sup>279</sup> Interview 16, June 2012; interview 21, September 2012; interview 26, September 2012; interview 33, December 2012; interview 37, December 2012; interview 39, December 2012; interview 47, June 2012.

<sup>280</sup> Interview 16, June 2012.

<sup>281</sup> Interview 16, June 2012; interview 37, December 2012; interview 62, May 2015.

<sup>282</sup> Interview 47, June 2013.

<sup>283</sup> Interview 44, June 2013.

<sup>284</sup> Interview 22, September 2012.

<sup>285</sup> Interview 8, December 2011.

<sup>286</sup> Interview 8, December 2011; interview 20, September 2012.

<sup>287</sup> Interview 58, January 2014.

<sup>288</sup> Interview 11, March 2012; interview 14, June 2012; interview 16, June 2012; interview 17, June 2012; interview 18, June 2012; interview 20, September 2012; interview 21, September 2012; interview 22, September 2012; interview 23, September 2012; interview 39, December 2012; interview 40, December 2012; interview 43, June 2013; interview 44, June 2012.

<sup>289</sup> Interview 22, September 2012.

<sup>290</sup> Interview 47, June 2013; similar stories were told in interview 39, December 2012.

on the horizon.”<sup>291</sup> Some actors stated that the lack of funding had implications for communities, as there would not be enough money for decent benefit sharing, which also implied deforestation would not be halted.<sup>292</sup> Some warned that many forest countries and communities were already heavily disappointed by the fact that far less funding had been mobilized for REDD+ than originally foreseen and that goodwill had been lost<sup>293</sup> due to the fact that the “sky money” had never appeared.<sup>294</sup> Disbursement had been exceptionally slow, and some interviewees had the impression that most funding seemed to disappear in UN and World Bank offices.<sup>295</sup>

## 5.5 REDD+ Funding and Forest Cover Change

REDD+ is based on the assumption that increased forest finance will automatically lead to reduced forest loss, yet there is little statistical or other empirical evidence that sustains that claim. For a performance-based environmental regime, REDD+ has produced little concrete evidence of performance so far.

The estimated USD 6.9 billion that has been granted or committed to REDD+ between 2006 and 2017 (Matthews et al., 2014) seems to have been disseminated without any clear criteria of either performance, or equity. The 2015 Forest Resources Assessment (FAO, 2015) shows that approximately one third of the world’s countries is still facing forest cover loss,<sup>296</sup> but, as shown in Table 5.3, only a fraction of these countries has benefited from significant REDD+ support of more than USD 10 million, while quite a number of countries that are not coping with forest loss have benefited from more than USD 10 million in REDD+ support.

**Table 5.3 Forest cover change and REDD+ support**

Country	Forest cover change 2010-2015	REDD+ support > USD 10 million
Angola	- 0.2%	
Argentina	- 1.1%	
Bangladesh	- 0.2%	
Belize	- 0.4%	
Benin	- 1.1%	
Bolivia	- 0.5%	
Botswana	- 0.9%	
Brazil	- 0.2%	862.3 million
Burkina Faso	- 1.1%	
Cambodia	- 1.3%	
Central African Republic	- 0.1%	39.9 million
Chad	- 2.4%	
Comoros	- 1.0%	
Congo	- 0.1%	

<sup>291</sup> Interview 38, December 2012.

<sup>292</sup> Interview 18, June 2012; interview 30, October 2012.

<sup>293</sup> Interview 39, December 2012; interview 41, December 2012; interview 58, January 2014; interview 61, January 2015.

<sup>294</sup> Interview 16, June 2012.

<sup>295</sup> Interview 18, June 2012; interview 26, September 2012.

<sup>296</sup> Please note that these FAO 2015 data do not reflect forest degradation or the replacement of natural forests by tree monocultures.

Country	Forest cover change 2010-2015	REDD+ support > USD 10 million
Democratic Republic of Congo	- 0.2%	54.6 million
Democratic Republic of Korea	- 2.3%	
Ecuador	- 0.6%	40.5 million
El Salvador	- 0.6%	
Equatorial Guinea	- 0.7%	
Guatemala	- 1.0%	
Guinea Bissau	- 0.6%	
Guyana	- 0.1%	257.3 million
Honduras	- 2.4%	
Indonesia	- 0.7%	189.2 million
Kyrgyzstan	- 1.2%	
Liberia	- 0.7%	
Madagascar	- 0.1%	
Malawi	- 0.6%	59.2 million
Mali	- 1.6%	
Mauritania	- 1.5%	
Mexico	- 0.1%	68.7 million
Mongolia	- 0.1%	
Morocco	- 0.1%	
Mozambique	- 0.5%	32.7 million
Myanmar	- 1.8%	
Namibia	- 0.1%	
Niger	- 1.1%	
Nigeria	- 5.0%	
Niue	- 0.5%	
Pakistan	- 2.7%	12.7 million
Panama	- 0.4%	
Paraguay	- 2.0%	
Peru	- 0.2%	
Republic of Korea	- 0.1%	
Senegal	- 0.5%	
Solomon Islands	- 0.3%	
Somalia	- 1.2%	
Sri Lanka	- 0.3%	
Sudan	- 0.9%	
Timor-Leste	- 1.6%	
Togo	- 8.1%	12.8 million
Uganda	- 5.5%	
United Republic of Tanzania	- 0.8%	
Uzbekistan	- 0.3%	
Zambia	- 0.3%	
Zimbabwe	- 2.1%	

Source: FAO, 2015; REDD+ Voluntary Database, recipient country data, 2016.<sup>297</sup>

Countries that have already halted forest cover loss according to FAO, yet still received more than 10 million USD in REDD+ support include Burundi (16.53M), Cameroon (10.67M), China (61.34M), Colombia (59.15M), Costa Rica (59.45M), Cote

<sup>297</sup> <http://www.fao.org/forestry/vrd/data/by/recipients> (last visited 10 May 2016).

d'Ivoire (24.12M), Ghana (66.05M), Kenya (16.94M), Laos (31M), Nepal (131.07M), Rwanda (17.88M), and Viet Nam (60.62M).<sup>298</sup>

Reducing emissions from deforestation is obviously not the main criterion for REDD+ support, even though it would be logical from an efficiency point of view to focus REDD+ support on those countries that suffer from the highest deforestation rates. The total area deforested per year in a country is another important factor in REDD+ efficiency, and the inclusion of the three developing countries (Brazil, Indonesia and the DRC) with the largest areal of forests being amongst the countries receiving more than USD 10 million in REDD+ support per year makes a lot of sense. However, the fact that countries like Angola (124,800 ha per year forest cover loss between 1990 and 2015), Argentina (307,200 ha per year), Bolivia 321,200 ha per year), Botswana (115,100 ha per year), Cambodia (139,500 ha per year), Democratic People's Republic of Korea (126,800 ha per year), Honduras (141,800 ha per year), Myanmar (407,100 ha per year), Nigeria (409,600 ha per year), Paraguay (233,400 ha per year), Sudan (174,400 ha per year), Tanzania (394,400 ha per year) and Venezuela (213,700 ha per year) (FAO, 2015) do not feature amongst the countries that receive more than USD 10 million REDD+ support seems to reflect a lack of criteria for prioritization. There is also no clear evidence that the countries who received most REDD+ support until now, Brazil, Guyana, Indonesia and Nepal, have scored best in terms of reducing forest loss.

In sum, it would be “naïve in a world of geo-politics to assume that funds would be disbursed on simple grounds of merit” (Skutsch and McCall 2010: 399).

## 5.6 Implications of the 2015 Paris Agreement for REDD+ Efficiency

The 2015 Paris Agreement<sup>299</sup> might have ambiguous outcomes for forest carbon markets and REDD+ finance. It is mainly a procedural agreement that allows countries to determine their own emission reduction targets. While a mechanism has been set up that might allow countries to purchase forest carbon offsets in other countries, the rules of that mechanism will not be determined before 2018,<sup>300</sup> and it is as yet uncertain whether these rules will permit forest carbon offsets. Moreover, all countries are free to include forest conservation and other land-use activities in their own commitments. As developing countries have, for the first time, committed to taking up specific emission reduction targets, it might be more beneficial for them to use REDD+ carbon credits to fulfil their own commitments.<sup>301</sup> While few clear rules for carbon trade were agreed upon in Paris, double-counting is explicitly prohibited.<sup>302</sup>

Another complication for carbon markets is that the Paris Agreement basically provides countries with the flexibility to organize national carbon offset markets according

<sup>298</sup> <http://www.fao.org/forestry/vrd/data/by/recipients> (last visited 10 May 2016).

<sup>299</sup> FCCC/CP/2015/10/Add.1, [http://unfccc.int/files/home/application/pdf/paris\\_agreement.pdf](http://unfccc.int/files/home/application/pdf/paris_agreement.pdf) (last visited 22 February 2016).

<sup>300</sup> Please note that the UN General Assembly has adopted a target under the Sustainable Development Goals that aims to halt all deforestation by 2020.

<sup>301</sup> See also <http://blog.globalforestwatch.org/2016/01/forests-are-in-the-paris-agreement-now-what/> (last visited 5 February 2016).

<sup>302</sup> FCCC/CP/2015/10/Add.1, [http://unfccc.int/files/home/application/pdf/paris\\_agreement.pdf](http://unfccc.int/files/home/application/pdf/paris_agreement.pdf) (last visited 22 February 2016).

to their own preference.<sup>303</sup> The result is a continuation of the current situation in which each national institutional framework treats forest carbon offsets differently, with different criteria for participation by public and private actors (see also Hunt and Baum, 2009, McDermott, 2014).<sup>304</sup> As Corbera and Brown already predicted in 2008, “[T]he room for harmonization of rules across instruments and scales of governance may become increasingly difficult.” (Corbera and Brown, 2008: 1976) The Paris Agreement seems to have done little to uplift the rather depressed State of the world’s carbon markets. In January 2016, it was reported that carbon credits in China were trading at record lows, between USD 1.37 and USD 4.92/ton CO<sub>2</sub>.<sup>305</sup> As a result, even some actors that used to be hopeful about market-based REDD+ funding are now fearing that future carbon markets will continue to exclude REDD+ (Boucher, 2015). Moreover, as rightfully pointed out, the resources mobilized by the industries that act as principal drivers of deforestation will continue to dwarf REDD+ funding and efforts should thus be targeted toward redirecting industry behavior in these key sectors (Boucher, 2015, see also Reynolds, 2012 and section 9.5.4).

## 5.7 Conclusions

This chapter has assessed why certain actors have promoted the REDD+ regime by analyzing the assumptions of key actors in the REDD+ regime and scholars about the economic efficiency of REDD+. It concludes that the efficiency of REDD+ was based on the assumption that REDD+ would act as a PES system that would reduce deforestation and mitigate climate change in a cost efficient manner reducing deforestation and that forest degradation and planting trees were relatively inexpensive climate mitigation policies. It was also expected that including forest carbon offsets in a mandatory global carbon market would generate billions of dollars for forest conservation. Many assumed that the participants in REDD+ schemes, be they governments, communities or landowners, would be fully aware of the opportunity and transaction costs of REDD+ actions, and that they would take economically rational decisions based on a proper calculation of costs and benefits.

However, many scholars and actors question the efficiency of REDD+ in light of (a) its high opportunity and transaction costs, which have been underestimated, often resulting in payments that are too low to compensate the costs (see 5.3, 6.5); (b) its dependence on permanent finance; (c) the dependence of such financial support on the existence of mandatory emission reduction targets and a functioning carbon market, which are not yet there; and (d) the fact that paradoxically, REDD+ is most efficient in the continents and areas with the lowest deforestation rates, while it seems economically unfeasible in countries and areas that suffer from high deforestation rates due to, especially, the expansion of commercial commodity production.

The need to compensate for opportunity costs requires permanent financial support, but there is significant concern about the future sources of REDD+ funding. It is as yet uncertain whether there will be significant carbon market finance for REDD+ due to

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<sup>303</sup> <http://carbonmarketwatch.org/news-paris-treaty-establishes-new-carbon-trading-mechanisms/> (last visited 5 February 2016).

<sup>304</sup> Interview 22, September 2012.

<sup>305</sup> <http://www.climatechangenews.com/2016/01/29/low-prices-raise-concerns-for-china-carbon-market/> (last visited 5 February 2016).

the ambiguity of the Paris Agreement. This means that the most stable and reliable source of financial support for REDD+ consists, as of January 2017, of public funding, but there are concerns that only a small proportion of this public funding consists of new and additional financial resources. This means that existing ODA, which could also be used for poverty reduction or other forest conservation or climate mitigation actions, is used for REDD+. If REDD+ is interpreted as a global PES scheme that aims to compensate the transaction and opportunity costs of forest conservation, between 3 and 100 % of the current global ODA budget would be required to finance it, on a permanent basis. REDD+ is reported to have changed the mentality of certain governments and communities, who now demand continued compensation for forest conservation. This means that current investments in REDD+ Readiness are partly in vain if no future REDD+ funding is secured, unless they were used for lasting changes that can be sustained without additional financial investments.

Besides, deforestation measures require significant upfront payments, but while discussions have started about the possibility of *ex ante* REDD+ payments, REDD+ is, by its own nature, an *ex post* payment system, that is, a system where most results are being paid for after they have been produced and verified (see 3.5). This discourages investments in strengthening governance and other measures that lead to results in the long run only. Moreover, the price of REDD+ is more likely to be settled through negotiations (in case of government to government contributions) or the market (in case of voluntary offset projects), rather than an accurate cost estimation.

Third, in terms of agency, this chapter has shown that economic incentives have been the driving force behind this regime, a point which will be explored further in Chapters 7 and 8.