

## MORAL LIMITS OF PAYMENTS FOR ECOSYSTEM SERVICES

Rohit Jindala

MacEwan University, Edmonton, Canada

Email: JindalR@macewan.ca

---

### Abstract

This paper reviews and analyzes the concept of payments for ecosystem services (PES) and focusing on their moral limits. PES is a part of recently introduced market instruments to address problems of pollution and environmental degradation. It is expected that hundreds of billions of dollars' worth of conservation investment will be transferred globally through PES like mechanisms. Using the framework of moral limits of markets, this paper highlights ethical concerns regarding this expansion of PES. A particular concern is the corruption that happens when cash transfers spoil the intrinsic motivations among many indigenous communities to engage in environmental conservation. Drawing on field research and empirical data from projects in Mozambique, and Tanzania, the paper identifies insights for policy makers, researchers, concluding with a discussion on directions for future research in this area.

**Keywords:** PES, Environmental Payments, Social Norms, Ethics, Moral Limits

---

### 1. Introduction

In this paper, we look at the concept of environmental payments, specifically Payments for Ecosystem Services and ethical concerns regarding their expansion across many parts of the world. While many researchers have written about the concept and scope of environmental payments, our main contribution is in terms of looking at moral limits of market based instruments in promoting conservation practices. This discussion is extremely relevant for two reasons. As the market based approaches are increasingly used to tackle environmental problems, there are growing concerns that these initiatives may lead to perverse outcomes, whereby the long term sustainability is actually harmed by the introduction of market transactions (Rode, Gomez-Baggethun & Krause, 2015). The second reason is that academic researchers have tended to take two diametrically opposite stands, those that completely favor the market approach to address environmental problems (Ferraro & Kiss, 2002; Wunder, 2005) and those that are in complete rejection (Kosoy & Corbera, 2010). From a policy perspective, it is imperative to find the middle ground by understanding when market based approaches make sense and when they do not. The present paper tries to fill some of the research gaps in this debate.

Markets have long been used to facilitate exchange of goods and services within and among human societies. However, use of markets or market like arrangements to pursue environmental objectives is relatively new. With the growth in economic activity since industrialization has come the associated degradation in environmental quality. One of the first policy instruments to address environmental damage was the idea of taxing the polluters or the 'polluter pays principle' (Pigou, 1920). Examples include carbon taxes and other environmental levies on production processes that lead to pollution. This was followed by a new proposition by Coase (1960) who showed that a market transaction between two firms (polluting and non-polluting) could lead to necessary reduction in polluting activity. Examples include market for emission of sulphur dioxide in the US and the carbon trading program in Europe (Jindal & Nambirembe, 2012). In both cases, regulatory agencies provide emission rights to concerned businesses that

can trade these rights amongst themselves such that the aggregate pollution level is gradually decreased.

In this paper, we focus on a particular market based mechanism called Payments for Ecosystem Services (PES). The origins of PES lie in attempts to conserve ecosystem services that are considered important for human survival, but are under threat due to rampant deforestation and land degradation. It involves paying land owners to adopt pro-environment land use practices that produce specific ecosystem services. Such PES programs are increasingly being taken up in different parts of the world around four main environmental services – carbon sequestration, biodiversity, scenic beauty and watershed protection (Jindal & Kerr, 2007).

Economic theory states that PES will be efficient in producing an ecosystem service whenever the payment made to landowners (or service producers) is more than their opportunity cost, but less than the monetary benefit that service users get from enjoying an ecosystem service (Pagiola, 2002). The literature also points out that conditionality which implies that payments will only be made when an ecosystem service has been secured, makes PES more effective than many of alternative options such as government regulation. Another advantage of using the PES approach is that it is relatively simpler to design (Ferraro & Kiss, 2002), and prone to be used by companies under their corporate social responsibility initiatives.

In recent years, PES projects worth millions of dollars have been taken up in many parts of the world, such as the Conservation Reserve Program in the US, Payments for Scenic Beauty in Europe, and the Bush Tender Program in Australia. Companies such as Coca Cola and Vittel, are also involved in PES projects either to secure the necessary ecosystem goods for their products, or as part of their corporate social responsibility initiatives. Similarly, the Paris Climate Accord signed in December 2015 has firmly placed international focus on performance based payments with payments worth billions of dollars being promised to developing countries for helping to reduce greenhouse emissions.

## **2. Main Criticisms of PES**

With the growth in PES, there have also been criticisms of this approach. These can be broadly categorized as concerns regarding its implementation and criticisms of the concept itself.

### **2.1 Challenges in implementing PES**

Many ecosystem services require sufficiently large proportion of the local area being under a similar land use without which these services cannot be produced (Ferraro, 2003). However, the actual land within these landscapes could be owned by different people as smaller parcels with completely different land use practices. So, unless these landowners collaborate together voluntarily to adopt the same land use, the landscape cannot produce these services (Jindal & Kerr, 2007). Even when land is commonly owned, the heterogeneous nature of resource users (herders interested in grazing their animals versus households that would rather grow timber trees) makes it difficult for them to agree to one particular land use. In such a case, having the same PES contract for everyone will likely result in under-enrollment. On the other hand, having lots of different kinds of contracts will require extensive monitoring.

This becomes even more problematic when the opportunity costs of different landowners are vastly different and are difficult to estimate for project managers. When combined with differences among landholders in terms of their socio-economic status, it can be difficult to determine *ex ante* what land use contracts would work best for the area. (Ferraro, 2008).

Another concern is *additionality*, i.e. the payment should lead to a larger provision of ES from a service provider than business as usual, which does not happen on its own and needs to be ascertained by an outside agent. Similarly, loss of additionality at the system level leads to *leakage*, whereby conservation induced by payments in one part of an ecosystem is associated with environmental damage in another part so that there is no net gain in environmental services at the aggregate level. For example, in return for carbon payments, landowners can protect trees in one part of the forest, but then cut trees outside the project area resulting in overall loss of carbon from the system (Jindal & Kerr, 2007). A related question is of *permanence* or long term sustainability of conservation practices in the area.

## 2.2 Criticism of the concept of PES

Kosoy and Corbera (2010) have criticized the concept of environmental payments on the grounds that it promotes commodity fetishism in which a market transaction masks the social relationships that underlie production. They build on the work of Marx (1867) and Jhally (1987) to point out that market based instruments such as PES are essentially reductionist in approach as they over-simplify the complex interrelationships that human societies have with nature. Moreover, reducing the multiplicity of values that can be attributed to ecosystem services and trading in only the most valuable service threatens the long term sustainability of the system that produces these services.

Another criticism of PES is that it may reduce internal satisfaction or the feeling of doing the right thing when people get paid for environmental conservation (Rode, Gomez-Baggethun & Krause, 2015). Research from psychology and behavioral economics shows that human behavior is driven by multiple sources of motivation. In case of environmental conservation, *intrinsic* motivators provide a sense of satisfaction to local landowners for doing the right thing for their community (Kerr, Vardhan & Jindal, 2014). In contrast, payments under PES type arrangements mainly act as *extrinsic* motivators, as they provide an economic incentive for people to adopt a particular set of land use practices. However, there is a risk that new incentive structures may “crowd-out” a community’s intrinsic motivation. When this happens, the outcome may be worse after the implementation of a PES project than before it (Rode, Gomez-Baggethun & Krause, 2015).

## 3. Moral Limits of Markets

While the concerns outlined in the previous section point out some limitations of PES, a more comprehensive framework to critique the expansion of the markets into hitherto newer areas is provided by Sandel (2012). In his book, “The Moral Limits of Markets”, Sandel expresses concern over the vastly expanded scope of markets in general, and articulates a framework to understand if this expansion is ethically justified. Sandel presents two main critiques to analyze situations when money can buy a good but it shouldn’t: (1) fairness, and (2) moral corruption.

### 3.1 Fairness

According to Sandel, fairness relates to the principle of free consent that is necessary for any market transaction to be morally justified (Sandel, 2012). He points out how, in practice, injustice is all pervasive as people buy and sell under inequality or economic necessity. When this happens, the market transaction fails to be fair. Examples include selling of organs by people under economic duress and surrogate motherhood. In both these cases, even though sellers appear to offer voluntary services, their decisions are affected by monetary compulsions making the market transaction unfair for them.

While the condition of fairness is extremely relevant, Sandel pointed out that this is a general requirement that can be addressed by better policy or more careful implementation. It is not a critique of market approach, but of how the approach is applied in practice.

### 3.2 Corruption

Corruption relates to the transformation that takes place when the good is transacted through the market, resulting in damage or destruction of its very nature. The money exchange, thus, either destroys the good or spoils its essential nature for which it is valued. In the eyes of the society, the good is now corrupted or diminished of its essential character and is no longer the same. A relevant example is if the Noble Prize were auctioned off, it would no longer hold its honorific value in the society (Sandel, 2012).

An important difference between corruption and fairness is that corruption of the good can happen both under conditions of equality and inequality. Establishing fairness does not guarantee that a good will survive its moral destruction. Instead, to establish whether or not a market transaction is ethically justified, each case has to be analyzed individually. It is not a question of how well a market operates, but whether or not a good is corrupted once it is open to monetary exchange.

## 4. Moral Limits of PES

The attractiveness of Sandel's 'moral limits of markets' framework is that though comprehensive, it is relatively simple to apply across goods and services that have traditionally been outside the purview of the market. Despite this, the framework is yet to be applied to PES and environmental payments in general to understand whether or not market based instruments are morally justified in the environmental arena. Although a detailed discussion on Aristotelian 'essentialism' would not be out of place here, our purpose is readily served by looking at the main characteristics of the environmental services that PES tries to secure.

### 4.1 Fairness in PES

Wunder (2005) describes PES as a *voluntary* transaction whereby the user of an environmental service pays the land user who can provide the service. The voluntary participation should provide free choice to both the contracting parties – the buyers or the service users and sellers or the service providers. However, in practice, transactions under PES can be unfair due to asymmetries of power, income and information between buyers and sellers.

Often, PES implementers are government agencies, or international and local NGOs that have more bargaining power than local communities that are recipients of PES contracts. In addition, rural communities in developing countries lack secure property rights to land and other natural resources, creating economic necessities for them to agree to interventions that are not beneficial for them. Even within communities, there are power and income asymmetries that can be utilized by the more powerful sections of the community to negotiate terms that are more beneficial to them. This can arise when in order to economize on transaction costs, PES projects are implemented across large landscapes that are inhabited by heterogeneous households. If project implementers are not careful, the poorer households may accept project conditions that result in wage and income loss for them in the long run (Pagiola, Arcenas&Platais, 2005).

Another element that can affect voluntary consent is *asymmetric information* between buyers and sellers of ecosystem services (Ferraro, 2008). Sometimes, the market value of an ecosystem service (e.g. biodiversity) is known only to the buyers while the service producers have a vague idea about it. This happens because of the absence of competitive markets in case of many



ecosystem services where the market information is held privately<sup>1</sup>. Another related phenomenon is when the service producers have private information about the actual cost of production, but they can negotiate more favourable terms with buyers who do not know the specific cost of producing an ecosystem service (Ferraro, 2008). Although in each of these cases, the participation of the service producers (or the service users depending on the case) is voluntary, the unfairness arises because one of the parties is unaware of the actual market value of the ecosystem service, leading them to accept different terms of the payment than they would have in presence of complete information.

#### 4.2 Corruption of environmental goods by PES

Often ecosystem goods and services are *complementary*, when one is produced another is generated simultaneously (Jindal & Kerr, 2007). For example, when local communities protect tropical forests, they not only get timber/fuelwood for their needs, but their conservation practices also yield valuable biodiversity/carbon sequestration benefits for the wider society. Providing payments to local communities may, however, lead to perverse outcomes as some members may start cutting down trees in expectation of a higher payment from outside. In this case, introduction of payment ends up damaging the very ecosystem service that it hopes to protect.

On the other hand, when ecosystem services are non-complementary (*substitutes*), program managers may be tempted to promote services that earn higher revenue from potential users. This becomes problematic if it leads to degradation of other ecological functions. For example, while fast growing monocultures are good for carbon sequestration, they result in loss of species diversity and may even have a detrimental effect on local hydrology. Thus, payments can threaten ecological security of the very ecosystem that they aim to conserve.

Another case where payments could spoil the conservation ethos is when people and communities hold environmental conservation as an intrinsic value. Singh (2015) describes case of a rural community in Odisha, India that has been involved in forest protection for a long time. The community members see their effort as expressing their gratitude towards forests as a gift from nature. These efforts have resulted in improved ecological conditions in the area and even stronger social ties among different community members. Singh calls these as affective socio-nature relations that are a source of joy and pride for the local people. However, these ties and the conservation effort can get eroded if external agencies merely monetize the level of ecosystem services generated in the area.

Often natural resources in developing communities exist as common property resources (CPR) that are owned jointly by a community rather than as private property. The rules governing the collective management of these resources evolve over time with well differentiated roles and responsibilities of different community members. Examples include management of village common lands in India and of surface irrigation in Bali, Indonesia (Kerr, Vardhan & Jindal, 2014). The production of ecosystem service in such cases is inextricably linked with the collective action that takes place at the local level. Introduction of external payments in absence of collective action may have perverse impacts, thus spoiling the ecosystem service that they aim to protect.

---

<sup>1</sup> This also presents a paradox. More markets are required to make them competitive and thus fair for buyers and sellers. And yet, creation of environmental markets also corrupts the essential nature of the good in many cases.

## 5. Examples from the Field

In order to deepen this discussion and generate additional insights about the relevance of PES, we now present two brief cases from the field followed by a discussion on some relevant lessons.

### 5.1 PES in Tanzania

The Uluguru Mountains in Tanzania are a biodiversity hotspot, known globally for a range of endemic flora and fauna. However, increasing population pressure and external market pressure has resulted in large scale deforestation with associated loss in biodiversity and other ecosystem services. A possible option to regenerate local resources is by promoting tree planting and protection on both private and common lands. A set of research studies recently undertaken recently have looked at the feasibility of these interventions (Kerr, Vardhan&Jindal, 2012; Jindal et al., 2013.)

In order to assess the feasibility of regenerating common lands, a survey was conducted among 153 local respondents on their willingness to participate in communal work under different incentives. These respondents were randomly distributed into five different groups (table 1). The survey found a high willingness among local people to participate in communal work, although the responses varied by treatments. Even though the highest willingness was expressed by the group that was offered a high individual payment of Tshs 1000 (treatment 3, 97% willingness)<sup>2</sup>, other groups where payment was not mentioned nor offered (treatment 1, 82% willingness), or no individual payment but money awarded to the village school (treatment 5, 76% willingness) also recorded high willingness among the participants. Indeed, the lowest willingness was recorded among the group where a low payment of Tshs 200 (treatment 3, 64% willingness) was offered. Clearly, the level of motivation among participants was not unidirectional, though it went up with high payment, it reduced considerably when the payment that was offered was deemed as trivial by the respondents. If a PES project was to only offer this level of payment, 64% of the people may still participate in the project, but the nature of the effort would be different from the case where no payment was offered.

Table 1: Survey regarding participation in communal work in Tanzania

Treatments	Willingness to participate
1. Payment neither mentioned, nor offered; n=39	32(82%)
2. Mention that no payment will be made; n=39	29(74%)
3. Individual payment of Tshs 200; n=39	25 (64%)
4. Individual payment of Tshs 1000, n=39	38 (97%)
5. No individual payment, but Tshs 1000 awarded to village school for each participant; n =38	29 (76%)
Total	153 (79%)

Source: Kerr, Vardhan and Jindal (2012)

As part of the same set of studies, a feasibility assessment of providing payments for planting trees on private plots was taken in form of reverse auctions, similar to the Bush Tender Trials in Australia. The details of the auction are discussed in Jindal et al. (2013). 251 valid bids were received in each of the two auction rounds. Based on the conservation budget available with the researchers, 32 people were contracted to plant 2560 trees in the area at an average payment of Tshs 20,000-30,000 (table 2). A monitoring exercise taken up almost two years after plantation

<sup>2</sup> The exchange rate at the time of data collection was TSH 1270 = 1US\$.

found high rates of compliance. Of the 23 farmers with carbon contracts, 18 had duly complied with the contract requirements with 63% of the trees surviving on their farms.

Table 2: Auction for tree planting contracts on private plots in Tanzania

	Round 1	Round 2
Mean bid	Tshs 143,840	Tshs 138,253
Median bid	Tshs 130,000	Tshs 126,000
Standard Deviation	96,105	93,105
Number of winning bids	15	17
Payment/Contract	Tshs 30,000	Tshs 20,000
Number of trees planted	1200	1360

Source: Jindal et al., 2013

Another study component was to evaluate the feasibility of tree planting and protection on common lands around which strong social norms already exist in the community. In order to simulate a real world PES project, the research team conducted an experiment with 123 local participants who were randomly divided into three groups. Each group was asked to plant trees in the school yard under a specific treatment: group 1 was offered no payment, group 2 an individual cash payment of Tshs 1000 and for the third group, payment of Tshs 1000 was made to the village school on the behalf of each participant. Experimental results showed that each group completed their respective task. However, exit interviews with group members showed marked variation. The group that was offered individual cash payment (treatment 2) showed least satisfaction as a majority of the group members were unhappy with the level of payment that was offered (57%). In contrast, both the other groups showed significantly high satisfaction levels with fewer members who were unhappy with the arrangement (table 3).

Table 3: Experimental results for tree planting on common lands in Tanzania

Treatment	Response to task under different payments		
	Very Happy	Happy	Unhappy
1. No individual payment	13 (33%)	22 (56%)	4 (10%)
2. Individual cash payment	2 (5%)	16 (38%)	24 (57%)
3. Payment to village school	13 (31%)	23 (55%)	6 (14%)
Total	28 (23%)	61 (50%)	34 (28%)

Source: Kerr, Vardhan and Jindal (2012)

## 5.2 Carbon payments in Mozambique

The long civil war in Mozambique led to loss of human lives, as well as severe environmental destruction, especially in a large chunk of Miombo forests. Since the return of peace, many environmental conservation projects have been initiated in the country including the Nhambita Community Carbon Project that pays local people to plant trees on their private plots as well as to protect 11,000 ha forest area in the Gorongosa National Park. Project activities began in 2003 and since then a large proportion of the households around the periphery of the park have joined the project (Jindal, Kerr&Carter, 2012). Payments to local households are made on the basis of the amount of atmospheric carbon sequestered by the newly planted trees on private lands, or the estimated enhancement in carbon stock from reduced deforestation and forest degradation (table 4).

Table 4: Carbon payments in Mozambique

Payments for tree planting on individual plots	Payments for protecting common forestland
<ul style="list-style-type: none"> <li>• Payments for 7 years</li> <li>• Payment \$400-\$800/ha</li> </ul>	<ul style="list-style-type: none"> <li>• 11,000 ha forest area</li> <li>• Payment to community fund</li> </ul>

On average, local households receive \$400-\$800 per hectare over seven years depending on the kind and number of trees planted by them. These payments are given to individual households. However, these payments are based on obligations by contracting households to protect the trees for the next 100 years. In order to ensure the long term sustainability of the carbon stocks, the project keeps 15% of all payments as a risk buffer against threats of impermanence. The payment for protecting the forestland is deposited in a community fund which is used to support infrastructure development in the area such as construction of a new school building, improvement in irrigation infrastructure and running of a primary health clinic (table 5). Project impacts include improved local incomes from carbon payments and sequestration of more than 200,000 tCO<sub>2</sub> from the atmosphere (Jindal, Kerr&Carter, 2012). However, the risk of cutting down of trees continues, especially after carbon payments end and successive generations have no additional incentives to maintain these trees.

Table 4: Impacts of carbon payments in Mozambique

Impact of individual payments	Impact of community payments	Threats
<ul style="list-style-type: none"> <li>• Increased income</li> <li>• Carbon payments: roofing , food, seeds, books, clothes</li> </ul>	<ul style="list-style-type: none"> <li>• Community Fund (\$2700)</li> <li>• New school building/ Primary health clinic</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of carbon stock for 100 years</li> <li>• Adequacy of risk buffer</li> </ul>

Source: Jindal, Kerrand Carter (2012)

## 6. Discussion& Conclusion

The two case studies from Tanzania and Mozambique and their sub-components present interesting insights. The response to trivial payments in Tanzania (table 1) shows that fairness is an important criterium for people and that participation rates can do go down when people perceive a market arrangement as unfair. Thus, from the standpoint of ‘moral limits of markets’ framework (Sandel, 2012) offering trivial payments in PES projects will be unfair and morally unjustified. However, there are many PES projects where such payments are offered and even accepted by local households that are desperate for some form of cash income. Under a ‘take-it-or-leave-it’ scenario, external agencies can exploit their negotiating power to force unfair contracts in which local participation is then non-voluntary.

The second insight is that in case of market interventions, ‘crowding-in’ (people providing conservation effort in return for payment which they would otherwise not provide), and ‘crowding-out’ (loss of intrinsic motivation to expend conservation effort when cash incentives are introduced) can happen in the same place and for the same resource. In Tanzania, a high level of conservation effort was observed when payments were offered for tree planting on private plots (table 2). In fact, participants deemed the auction process and the resultant payments to be ‘fair’, which also resulted in high levels of compliance. On the other hand, strong social norms around management of common lands dictated that people should perform their



work as their moral responsibility. When payments were introduced for these tasks, compliance rates remained high, but the satisfaction level went down (table 3). This result is in contrast to many previous studies (e.g. Rode, Gomez-Baggethun&Krause, 2015) that tend to report crowding-in or out as community dependent. Instead, our results show that this phenomenon is much more subtle than that and depends on the specific context, which means that monetary exchange may degrade the environmental service in some instances, but it may also enhance the good in other cases for the same community.

Finally, the case from Mozambique indicates that external payments do help in scaling up conservation effort in an area. However, the long term sustainability and the viability of the environmental good remain questionable. In this case, it is unclear whether or not community members will honor their carbon contracts (which may be described as unfair due to fixing of obligations on future generations) once the payments are over. This is akin to temporal crowding-in (in the short run) and crowding-out (in the long run). Thus, the introduction of payment provides the good in the short run but ends up corrupting it in the long run.

These insights provide useful lessons for policy makers on how Sandel's framework is useful in analyzing the ethical justification when introducing market based instruments for environmental conservation. Future research needs to explore alternative policy options when cash payments are either unfair or corrupt the good, but external interventions of some kind are needed to secure and scale-up conservation effort.



## References

- i. Coase, R., 1960. The Problem of Social Cost. *Journal of Law and Economics*, 3(1).
- ii. Ferraro, P. J., 2008. Asymmetric Information and Contract Design for Payments for Environmental Services. *Ecological Economics*, 65, pp. 810– 821.
- iii. Ferraro, P. J. & Kiss, A., 2002. Direct Payments to Conserve Biodiversity. *Science*, p. 298.
- iv. Jindal, R. & Kerr, J., 2007. *USAID PES Sourcebook: Lessons and Best Practices for Pro-poor Payment for Ecosystem Services*. Virginia, USA: OIRED.
- v. Jindal, R., Kerr, J. & Carter, S., 2012. Reducing Poverty through Carbon Forestry? Exploring Impacts of the Community Carbon in Mozambique. *World Development*, 40, pp. 2123-2135.
- vi. Jindal, R., Kerr, J., Ferraro, P. & Swallow, B., 2013. Social Dimensions of Procurement Auctions for Environmental Service Contracts: Evaluating Trade-Offs between Cost-Effectiveness and Participation by the Poor in Rural Tanzania. *Land Use Policy*, 31, pp. 71-80.
- vii. Jindal, R. & Nambirembe, S., 2012. *International Market for Forest Carbon Offsets: How These Offsets Are Created and Traded*. Lecture Notes, World Agroforestry Centre, Nairobi
- viii. Kerr, J., Vardhan, M. & Jindal, R., 2012. Prosocial Behavior and Incentives: Evidence from Field Experiments in Rural Mexico and Tanzania. *Ecological Economics*, 73, pp. 220-227.
- ix. Kerr, J., Vardhan, M. & Jindal, R., 2014. Incentives, Conditionality and Collective Action in Payment for Environmental Services. *Int. Journal of the Commons*, 8(2), pp. 595-616.
- x. Kosoy, N. & Corbera, E., 2010. Payments for Ecosystem Services as Commodity Fetishism. *Ecological Economics*, 69, pp. 1228-1236.
- xi. Marx, K., 1867. *Capital, Volume One, Part One: Commodities and Money*.
- xii. Pagiola, S., Arcenas, A. & Platais, G., 2005. Can Payments for Environment Services Reduce Poverty? An Exploration of the Issues & Evidence to Date from L America. *World Development*. 33(2).
- xiii. Pagiola, S. & Platais, G., 2002. *Payments for Environmental Services*. Environmental Strategy Notes. No. 3. The World Bank, Washington DC.
- xiv. Pigou, A. C., 1920. *The Economics of Welfare*. London: Macmillan.
- xv. Rode, J., Gomez-Baggethun, E. & Krause, T., 2015. Motivation Crowding by Economic Incentives in Conservation Policy. A Review of Empirical Evidence. *Ecol Econ*, 117, pp. 270-282.
- xvi. Sandel, M. J., 2012. *What Money Can't Buy: The Moral Limits of Markets?* Macmillan.
- xvii. Singh, N. M., 2015. Payments for Ecosystem Services and the Gift Paradigm: Sharing the Burden and Joy of Environmental Care. *Ecological Economics*, 117, pp. 53-61.
- xviii. Wunder, S., 2005. *Payments for Environmental Services: Some Nuts and Bolts*. CIFOR Occasional Paper (42).