Mottled motivations, direct incentives: Understanding people's engagement with incentives for shade grown coffee in the Western Ghats, India

Arshiya Bose[1], Claude Garcia[2] and Bhaskar Vira[3]

Conference Paper

Resource Politics 2015

Institute of Development Studies

7 – 9 September 2015

resourcepolitics2015.com

[1] Black Baza Coffee, Bangalore.
[2] Department of Environmental Systems Science, ETH, Zurich.
[3] Department of Geography, University of Cambridge.

Abstract
Market-based instruments (MBIs) have proliferated to address environmental degradation, including biodiversity loss in biodiversity-rich landscapes outside Protected Areas (PAs). In the case of coffee, third-party certifications oriented towards traceability, environmental sustainability, fair treatment of workers, quality and price security aim to make it economically possible for farmers to adopt sustainable coffee production and/or compensate the loss in yields that may arise from adopting such practices. The key assumption underpinning these approaches is that extrinsic monetary benefits (through certification or direct payments) present stronger incentives to modify land-use and livelihood practices than intrinsic motivations.

The history of direct payments for conservation in India has thus far been very limited. This study was carried out in Kodagu district within the Western Ghats, one of 34 global 'biodiversity hotspots'. Our evidence shows that perceptions of coffee growers differ considerably from inbuilt assumptions in policy and theoretical discourses on market incentives. In Kodagu, coffee growers adhere to the rules of certification not for economic reasons but rather for capacity-building and increased knowledge. They believe that economic security should be achieved through long-term mechanisms, such as enhanced quality, elevated status geographically exclusive specialty coffees, rather than short-term, immediate financial arrangements in the form of a price premium or one-off conservation payments.

This paper argues that failing to recognize the complex of intrinsic and extrinsic motivations based on which landholders make decisions about conservation, leads to a potential crowding out effect wherein motivations to participate in future conservation projects are weakened. Instead, we argue for 'farmer-friendly' incentives that recognize the diversity of expectations that landholders have out of their engagement in conservation activities.

1. Introduction

Market-based instruments (MBIs) have proliferated to address environmental degradation, including biodiversity loss in biodiversity-rich landscapes outside Protected Areas (PAs). The development of such mechanisms have paralleled increasing recognition about the functional roles linking biodiversity and production in farmlands (Swinton et al. 2007, Turner and Daily 2008 (Kleijn et al. 2009)). The agri-environment schemes of the European Union (EU) Common Agricultural Policy that offer direct payments to farmers to modify their farming practices are good examples of large-scale market-based incentives in agricultural landscapes ((Kleijn & Sutherland 2003).

Coffee plantations have been one of the most active spaces for MBIs through third-party certifications oriented towards traceability, environmental sustainability, fair treatment of workers, quality and price security. Shade-grown coffee certifications emerged as a response to the decline of North American migratory birds, the majority of which winter in tropical forests in Central and South America (Perfecto et al. 2005). In comparison to coffee grown under open sun conditions, farms that maintain shade cover and tree species

diversity are shown to support greater biodiversity (Phillpott et al 2007, Perfecto et al 1996, Moguel and Toledo 1999, Greenberg et al 1997, Perfecto et al 2005 and Perfecto et al. 2007). Shaded plantations also sequester carbon, retain soil moisture and buffer coffee plants against extreme climactic conditions, in particular drought and high temperatures. Shade coffee is also said to increase the effectiveness of microbial and parasitic organisms against coffee pests (Muradian & Pelupessy 2005; Staver et al. 2001). Rice (2003:234) uses the term "coffee as habitat" to refer biodiversity benefits that shaded coffee farms can provide for plants, insects and other arthropods, birds, mammal and though fewer research projects have studied them, reptiles and amphibians. Numerous studies demonstrate that naturally-shaded coffee plantations can serve as 'refuges for tropical biodiversity' (Perfecto et al. 2007), especially in regions with increasing fragmentation of forest areas. Nevertheless, there is an complex relationship between coffee productivity, yearly variability and shade cover (Muschler 2009). Beyond a threshold of 48% shade, decreasing coffee yields have been reported (Soto-Pinto et al 2000). This pattern is argued to have created major incentives for the conversion of coffee farms from shade-grown to sun-grown. In this respect, market-based incentives have been designed to compensate for the loss in yield that would occur from maintaining shade trees for biodiversity habitats. Through such mechanisms, positive monetary incentives in the form of price premiums are provided to farmers to produce coffee through farming practices that have been specified by a third-party agency.

Although the structure of shade-grown certification differs considerably from other market-based incentives such as PES or direct payments, certification shares with these modalities an underlying premise of market-based environmental and social change. For example, direct incentives are defined as "Mechanisms that are targeted to specific objectives and encourage natural-resource users to conserve biodiversity by providing rewards, most commonly monetary, for changed behaviour" (Emerton 2000:3). The implicit logic behind direct incentive measures, including certification is that people do not degrade biodiversity for no reason and destructive activities are allowed to take place because of failures and distortions in economic markets, laws and policies and institutions whose role is to govern the use of natural resources (Ibid:10). In this respect, the essential aim of incentive measures is to influence people's behaviour and resource use decisions by making it more economically desirable to conserve rather than degrade biodiversity. Incentives are needed when "nature conservation does not make economic sense" (Ibid:23). This logic aligns well with evidence regarding the decrease in coffee productivity as a result of larger number of trees and greater shade canopy on farms. In the absence of positive, monetary incentives, maintaining native trees on coffee farms appears 'not make economic sense'. Therefore, certification aims to make it economically possible for farmers to adopt sustainable coffee production and/or compensate the loss in yields that may arise from adopting such practices. In most cases, certification could be seen as a "scheme that provides a guaranteed price premium to service providers for the provision of an ecosystem services" and hence, equivalent to a PES approach (Sommerville et al 2009:36).

Current debates on market-based strategies and the use of monetary incentives center on their effectiveness and potential social benefits for local communities. The key assumption

underpinning incentive approaches is that extrinsic monetary benefits present stronger incentives to modify land-use and livelihood practices than intrinsic or indirect benefits. For the purpose of this paper, we consider monetary incentives and direct payments as extrinsic motivators where the influence to change land-use and resource use comes from outside the individual. In contrast, intrinsic motivators are derived from the self-desire within an individual rather than relying on external factors. Curiosity, inherent belief in the merits of a programme, specific values attached to nature and biodiversity, capacity-building and desire for knowledge are all possible intrinsic motivators to participate in a conservation programme. Historically, a range of conservation approaches relied on strengthening intrinsic motivations as a way to induce sustainable natural-resource use. For example, conservation education programmes frequently work with schools in and around PAs to instill stewardship and sustainable ways of living with the next generation of community members. In such projects, the explicit aim is to minimize the conflict between the park and the people by highlighting the importance of conserving the natural and cultural environment (WWF 2015). Conservation organisations like Rare focus on 'pride campaigns' to inspire pride around unique natural assets and create a clear path for local change (Rare 2015). Using social marketing campaigns, Rare disseminates messages to evoke the desired behavior just like the private sector has done for years to sell goods and services (ibid). However, such conservation models are often termed as 'conservation by distraction' (Nicholls 2004:1257).

A growing scholarship has thus argued in favour of the cost-effectiveness of approaches that respond to extrinsic motivations to achieve conservation. The manner in which conservation approaches build upon both extrinsic and intrinsic motivations differ in their approach, i.e. whether providing short-term or long-term incentives. Direct incentives are typically immediate payments that respond to peoples' motivations for short-term financial returns or benefits. In contrast, a number of indirect incentive approaches respond to a combination of intrinsic and extrinsic motivations to achieve conservation. For example, a conservation education project could highlight the importance of sustainable harvest from the purpose of instilling an intrinsic conservation stewardship but also from the point of view of judicious use of resources enabling long-term economic benefits from harvested goods. The latter approach is significantly different from a direct payments project aiming to purely fulfill extrinsic motivations of a quick and immediate cash outcome. Furthermore, it has also been contested that direct incentives could undermine environmental stewardship through various ways including that an excessive focus on economic efficiency or the exchange value of ecosystem services that neglect issues of procedural fairness, equitable distribution of benefits from the project could lead to a 'crowding out' non-monetary motivations to protect the environment (Corbera et al. 2007). Sandel (2012) argues that commodification, privatization and marketization have moral limits beyond which monetary values assigned to certain processes cause indignity and lead to crowding out of other motivations such as feelings of altruism (Frey and Oberholzer-Gee 1997, Frey and Jegen 2001, Mellstram and Johannesson 2008) making it counterproductive for conservation.

In the certification context, the logic of extrinsic motivators is explicitly used to incentivise coffee growers in the short-term to adopt environmentally sustainable and socially responsible production, including maintaining native tree species on plantations. Coffee growers that qualify with the environmental and social standards set by third-party certifiers are audited, certified and therefore eligible to the incentive. There are typically two forms of incentive: (i) a price premium, (ii) protected access to markets, buyers sourcing certified coffee for their niche and premium markets. Eco-certified coffee represented 8% the global market in 2009 and this niche is developing fast (Kilian et al. 2006; Pierrot et al. 2010)

There is little empirical evidence on what encourages people to adopt and maintain an ecologically compatible lifestyle. With regards to motivations to join certification schemes, data is grossly insufficient but evidence from participation in PES-type schemes show mixed outcomes. Fisher (2012) states that payments are the main motivator for involvement in such schemes. In contrast, other studies show that landholders are less motivated by financial and extrinsic incentives than intrinsic motivations like a stewardship ethic (Ryan et al. 2010, Greiner and Gregg 2011). However, despite the lack of empirical evidence on this subject, a large number of policies and ideologies, whether those of institutions like the IUCN, state-led REDD+ programmes, agri-food certifications or the field-level projects of conservation organisations big and small are increasingly relying on extrinsic motivators such as direct incentives or PES to encourage landholders to adopt conservation-friendly land-uses. This paper attempts to question the assumption regarding the importance of extrinsic catalysts as a motivation for changes in landuse and land management strategies. We test this hypothesis in the Indian context, where the history of direct payments for conservation has thus far been very limited (Bose 2014). The development of eco-labels in the coffee sector was slow, despite the environmental qualities of the production system (Garcia et al. 2010). Rainforest Alliance certification arrived in 2009, and the main certifications present are Utz Certified, Organic and Fair Trade (Marie-Vivien et al. 2014). What can explain this slow uptake when environmental conditions make it easy for farmers to comply with the environmental standards?

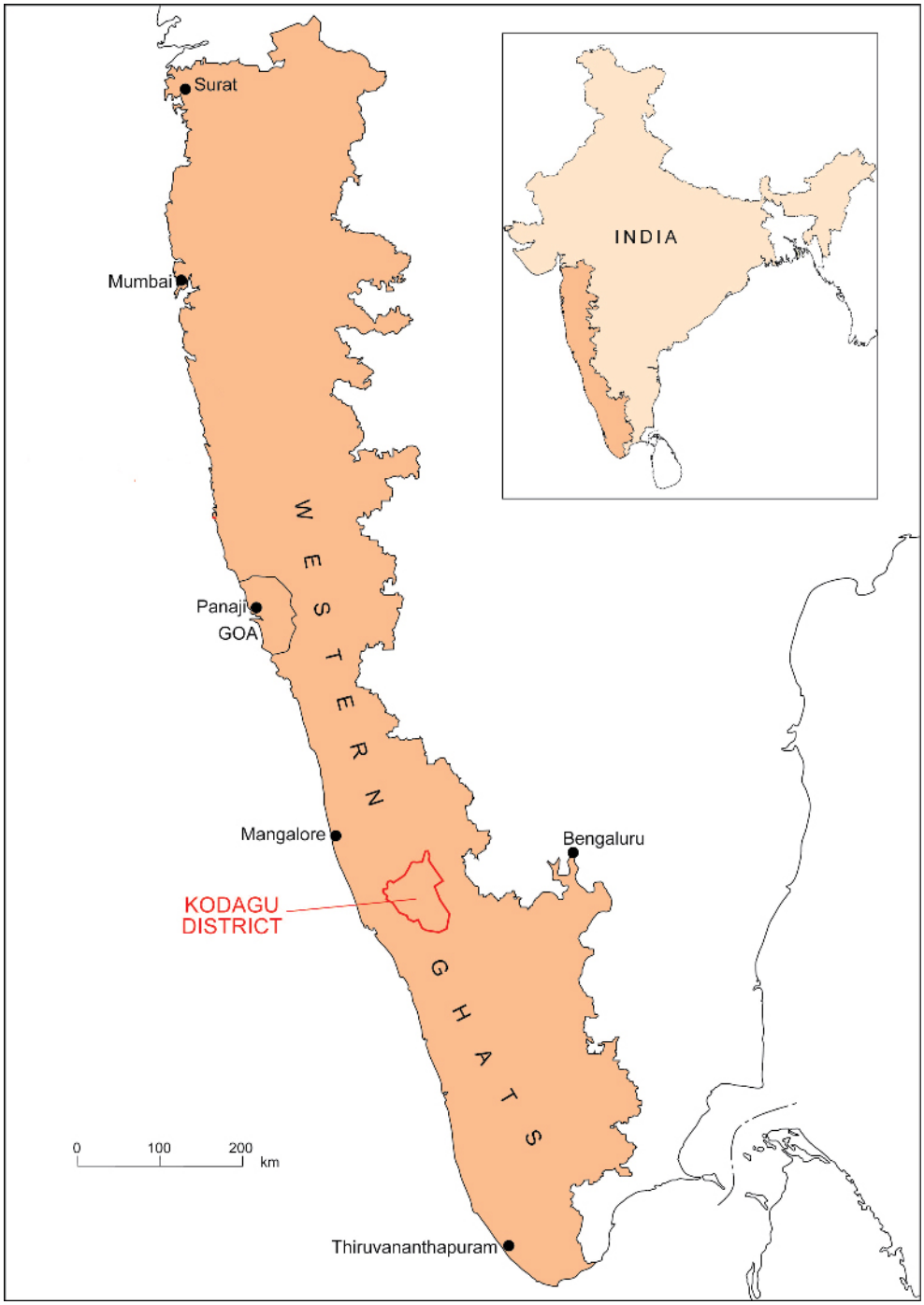
Our work finally asks the question: have conservation programmes that use direct payments ignored intrinsic motivations in their programme design? The empirical findings presented in this paper contribute to a better understanding of the range of psychological, behavioral and social factors that drive these land-use and land management decisions and explicitly engage with debates on crowding-in and crowding-out in conservation.

The structure of this paper is as follows: Section 2 provides background into the study area and conservation context, including describing details about the design and implementation of Rainforest Alliance certification for ecologically sustainable coffee. Section 3, presents the empirical evidence collected in this study and outlines the motivations of coffee growers to participate in certification. Section 4 is a discussion on the implications of the results of this study for wider scholarship on market-based instruments for conservation, including policy and design of field-level projects.

2. Research Site and Methods

This study was carried out over a period of fifteen months from 2011 to 2014 in Kodagu district in the state of Karnataka. The district falls within the Western Ghats, one of 34 global 'biodiversity hotspots' (Mittermeier et al. 1998, Myers et al. 2000).

Fig 1. Map showing Kodagu district



Spanning an area of 4102 sq.km, Kodagu has three major land use; state-controlled forests, urban areas and agricultural lands. State-controlled forests comprise 38% of the district's area (National_Informatics_Centre 2011), with one National Park and three Wildlife Sanctuaries as statutory Protected Areas. Urbanisation is an increasingly dominant feature with considerable lands including former terraced rice fields converted into towns and settlements under the combined pressures of land demand for tourism and population

growth (Leroy et al. 2011). Agriculture, in particular, coffee cultivation covers up to one third of the district (Garcia et al. 2010). Apart from coffee, black pepper, rice and cardamom are important commercial crops for the district, contributing almost 40% of annual farm-based revenue (Sathish et al. 2006). Coffee is one of the key drivers of the regional economy and the cultural identity of Kodagu (Ghazoul et al. 2009). Coffee production provides direct employment for about 500000 people in India and 254001 in Kodagu alone (Lee and Lee 2010). As of today, coffee in the district covers a total of 104000 ha (75500 ha of Robusta [*Coffea* canephora] and 28500 ha of Arabica [*Coffea Arabica*]), with a production of 120916 metric tonnes (CBI 2013).

The landscape is therefore a complex mosaic of multiple elements, many of which are tree baseds. Trees, in one form or the other, cover over 78% of the district. Outside of the State controlled Protected Areas, the district harbors about a thousand sacred groves under more or less formal community management. Private owners control shaded-coffee plantations and a few scattered remnants of private forest or cardamom plantations not yet converted into coffee. Shade-grown coffee plantations comprise 33% of the tree cover of the district (Bhagwat et al. 2008). Unlike other coffee production areas in the world, farmers maintain multi-storied coffee agroforestry system for a variety of reasons, including but not restricted to tenure rights, timber and pepper production, and the protection of the coffee flower buds during the dry season (Garcia et al. 2010). In addition, shade coffee plantations provide a range of ecosystem services such carbon sequestration and pollination, presently not necessarily valued or recognized by the supply chain (Elouard et al. 2000, Ambinakudige and Sathish 2009). As many of these trees are the remnants from the former forest covering the district, shaded coffee plantations in Kodagu have a very high biodiversity, and are shown to play a role in conservation outside protected areas (Depommier 2003, Bhagwat et al. 2005, Garcia et al. 2009, Ghazoul et al. 2009). Tree densities on an estate range from 285 to 1471 trees per hectare, a figure that is comparable to that of surrounding deciduous and evergreen forests (Desjeux 1999). However, this unique coffee agroforestry landscape is undergoing transformation linked to the intensification of coffee production, many of these leading to a biodiversity loss. The three major drivers of this change are (a) the loss of forest cover and expansion of commercial croplands; (b) the reduction of shade canopy on coffee plantations; and (c) the increase of the proportion of exotic tree species in the canopy. Garcia et al. (2009) suggest that 30% of forest cover was lost between 1977 and 1997 while the area under coffee doubled, particularly between 1982 and 1986 (Lal et al. 1990). The impact of intensification of coffee cultivation, whether through the conversion of forest, cardamom and paddy lands, reduction of shade cover or increase of exotic species, has been widely documented. In the Coorg context, research projects have studied the impact of intensification on biodiversity: bird and insect diversity and pollination services (Muschler 2001, Vaast et al. 2006, Rao 2011). This previous research has shown that the intensification of coffee production through shade reduction and replacing native trees with exotic trees in the ecologically fragile areas where coffee has been cultivated would have long-term impacts on the environment which might effect ecosystem services like water supply, carbon sequestration and biodiversity.

It is in this climate of coffee intensification and increased documentation of biodiversity loss that local and international scientists and conservation organisations advocated the use of shade-grown certification as a means to address the trade-offs that coffee producers face when making decisions about increasing productivity and maintaining native shade trees.

Rainforest Alliance certification was first implemented in the district in 2008. The Alliance's mission is to "conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices and consumer behaviour" (RA 2012). The Alliance states, "We believe that the best way to keep forests standing is by ensuring that it is profitable for businesses and communities to do so. That means helping farmers, forest managers and tourism businesses realize greater economic benefits by ensuring ecosystems within and around their operations are protected, and that their workers are well-trained and enjoy safe conditions, proper sanitation, health care and housing. Once businesses meet certain environmental and social standards, we link them up to the global marketplace where demand for sustainable goods and services is on the rise" (RA 2012). Rainforest Alliance has developed 'seals of approval' for sustainable forestry, agriculture and tourism. The Rainforest Alliance standard for coffee is broadly premised on the following principles (see Table 1).

Table 1. Ten principles that govern rainforest alliance's sustainable agriculture certification

1. Establishing and maintaining a social and environmental farm management system
2. Ecosystem conservation through protection of waterways and wetlands
3. Wildlife protection through monitoring presence
4. Water conservation through monitoring of usage and non-contamination
5. Fair treatment and good working conditions through prohibition of child labour and adherence of norms proposed by international bodies such as the United Nationals and International Labour Organisation
6. Occupational health and safety to reduce the risk of accidents
7. Building community relations through consultation with surrounding farms about certification processes
8. Integrated crop management through restriction of chemicals that pose danger to people and the environment.
9. Soil management and conservation through prevention of erosion and reduction of chemicals use, wherever possible
10. Integrated waste management through recycling, reducing consumption and safe disposal

Source: (SAN 2010)

In order to qualify for certification, producers have to ensure that their management practices comply with Rainforest Alliance's certification standards. This could include some of following activities prohibiting the use of banned chemicals; protecting waterways; prohibiting the conversation of forestland to coffee; hunting of wildlife and over-harvest

of medicinal plants; maintaining minimum wages for workers etc. Producers also have to invest time and capital into systematic bookkeeping such as maintaining records of chemical inputs, production costs and sightings of wildlife; protective wear such as gloves, masks and coats for workers to be worn during application of chemicals; and maintaining storage and processing facilities as per certification standards. Certified farms are required to comply with at least 80% of the total criteria of the Sustainable Agricultural Standard and 50% of criteria within each of the above ten principles. Farms must also comply with all critical criteria. Any non-conformity with criteria is categorized as either 'major non-conformity' (indicates compliance with less than 50%) or 'minor non-conformity' (indicates compliance more than 50% but less than 100%). While authorized auditors can use their discretion on assessing compliance of all criterions in the certification policy, Rainforest Alliance has stipulated non-negotiable criterion that must be evaluated on every farm inspection and not subjected to the auditor's discretion. Once a farm is audited, its coffee can be labeled and sold to buyers of certified coffee. These certified buyers, mostly exporters purchase certified coffee and in return offer growers a price premium. Since certification was first initiated in the study area, this price premium has remained USD 1 cents and USD 2 cents per kilogram over the market price of Robusta and Arabica respectively. Growers who choose not to participate in certification can freely sell their coffee to generic traders, referred in this paper as 'conventional buyers'. The assumption is that because participation is voluntary, the price premium would motivate growers to modify farming practices to maintain the specified shade canopy and adopt environmental and social welfare standards.

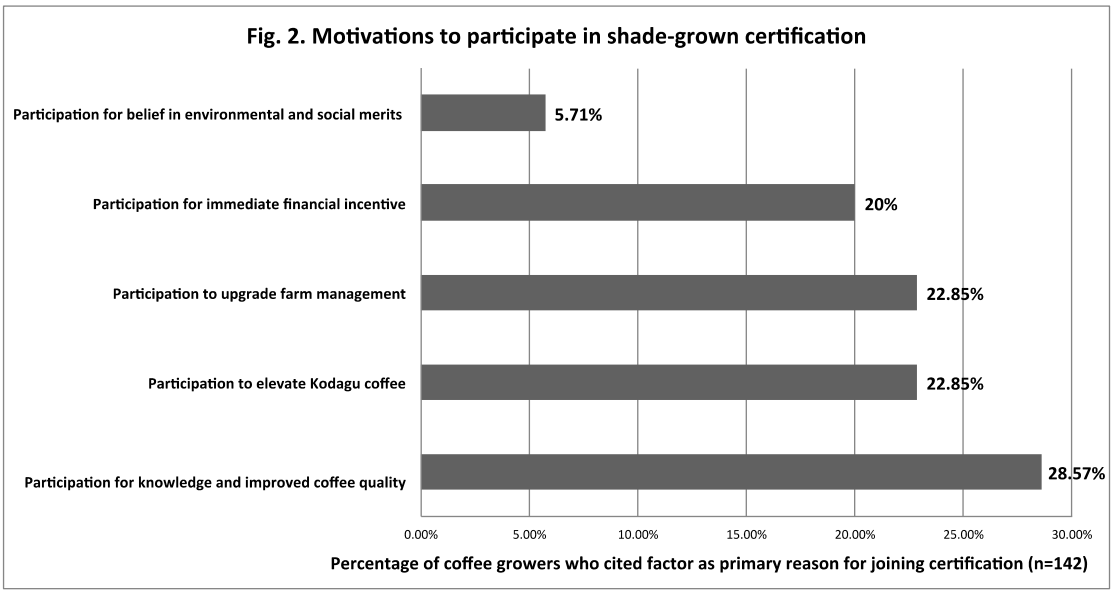
Semi-structured and open-ended interviews constitute the main research method in this study. Interviews were conducted through clustered sampling based on key certified farmers' groups. A total of 222 coffee growers were covered, including 142 certified and 80 non-certified producers. The average size of landholding amongst certified growers was 11.58 hectares (n=142, SD ± 10.15)[4]. Each farmer incurred mean production costs of USD$ 472.31 per acre (n=142, SD± 9,391) and yielded an average output crop of 1187.5 kilograms of coffee per acre (n=142, SD± 11.5). Producers with Robusta coffee were on average able to negotiate a price of Rs 50 per kilogram of coffee (n=101) and Arabica coffee growers availed Rs 192 per kilogram (n=31). This implies that the direct incentive to participate in certification is equivalent to a 2% increase in sale price per kilogram of Robusta coffee and 1.04% increase in price for Arabica growers.

This group of 142 certified growers were asked to rank the relative importance of factors in their decision to participate in Rainforest Alliance certification. Data from open-ended interviews was recoded to glean key elements of the interviewee's response to questions on reasons for joining certification. This process yielded five major motivations for participation in certification.

[4] Average landholding size for non-certified growers was 14.80 hectares (n=80, SD± 18.45) with no significant difference between certified and non-certified groups (Mann-Whitney, p=0.9853).

3. Results

This study shows that coffee growers are motivated by a diversity of incentives to adopt Rainforest Alliance certification – some intrinsic and others extrinsic motivations. Financial incentives to participate in conservation programmes are only one of a suite of different motivators (see Fig. 2).



These five key motivations for participating in certification programmes are elaborated in more detail in the sections below.

3.1 Participation for the immediate financial incentive (20*%):*

In theory, the price premium for certified shade-grown coffee is conceptualized and designed to act as the primary incentive for farmers to modify their behaviour and land-use decisions to adopt sustainable farming practices. In the Kodagu context, certified buyers provide a market-determined price premium for certified coffee. As mentioned earlier, at the time of this research, the price premium was USD 1 cent and USD 2 cent for Robusta and Arabica respectively. For some coffee growers, the financial incentive was the primary motivator for joining shade-grown certification, as is evident in comments such as,

> "I certified to get the premium" (CF-5). "The promise of a higher price was attractive" (CF-24).
>
> "Price premium was the only reason I certified" (CF-34).

Farmers who perceived certification price premiums as adequate incentives feel that:

> "Premium is better than developmental benefits because it helps to solve labour problems" (CF-16).

Fundamentally, this group of coffee growers would argue their primary motivation for joining certification programmes is to avail of the immediate financial compensation. Such growers did not have any other expectations or desires from the certification process.

3.2 Participation for knowledge and improved coffee quality (28.57%):

The participation of coffee growers in Kodagu in Rainforest Alliance certification seems to derive from an intrinsic desire to improve a farm's coffee quality. For example, 28.57% (n=142) of growers interviewed described this as the primary reason for joining certification. This is evident in the following comments by growers:

> "I went for Rainforest Alliance certification because I want information on the quality of my berries" (CF-1[5]).

For example, when certified growers approach buyers of certified coffee for a sale, the certified buyer measures quality parameters such as moisture and out-turn[6]. This 'Quality Report' is handed over in the form of a physical document to the grower. This quality report can then be used as the basis to improve post-harvest processing and storage practices which are key factors in improving one's coffee quality. In many cases, this quality-related information acts as a more attractive incentive than the certification premiums.

> "Evaluation of my coffee is a strong incentive for me to try and improve my quality" (CF-21).

In comparison, conventional buyers do not explicitly provide any information on coffee quality to the growers. Instead, conventional buyers estimate quality parameters such as outturn based on regional proxies rather than direct measures and this is perceived by many producers as 'unscientific' and 'obsolete'. For example, growers commented,

> "Local traders are not maintaining quality. Our estate's reputation gets spoilt because our coffee is mixed with coffee that has moisture and berry borer[7]. I sell my coffee to certified buyers because they purchase only good coffee" (CF-35).

> "I joined because I wanted to know how good or bad my coffee is" (CF-101).

The provision of knowledge about quality parameters of coffee and an overall perception that certification standards might eventually lead to improvements in coffee quality are perceived as the primary rationale behind joining shade-grown certification. While it could be argued that the desire to improve quality derives from extrinsic motivations linked to better economic outcomes as a result of improved quality, it is worth noting that coffee growers interviewed in this study did not mention such linked economic outcomes. In fact, the current Indian market does not significantly price differentiate between coffees of varying qualities at the farm level. From the perspective of coffee growers, improving

[5] Certified Farmer
[6] Outturn revers to the proportional weight of coffee cherry with clean coffee (i.e. after removing husk)
[7] Referring to a common pest of coffee cherries

quality derived from intrinsic motivations to fundamentally better their involvement in coffee production and more so than the financial incentive associated with adopting certification standards.

3.3 Participation to elevate Kodagu coffee (22.85%):

Coffee growers in Kodagu who participate in Rainforest Alliance certification are intrinsically motivated by the opportunity to be more active in global markets and elevate the status of Kodagu coffee. For example, growers join certification as a way to "learn the ropes" (CF-78) of how global marketing of coffee works in order to launch independent estate coffee brands through which to highlight individual farms. Certification is also seen as an important step towards establishing the identity of 'Kodagu coffee' as high-quality coffee internationally. Many producers share their vision to build either a collective Kodagu brand or single-estate brands and strategically use certification as a stepping-stone in this process. For example, coffee growers says,

> "I certified my estate to see how we are being promoted globally" (CF-2).
>
> or: "Kodagu is as special as the Jamaican Blue Mountains so why is our coffee not known?" (CF-57).

A key driver of perceptions that the certification process can help producers establish estate-level coffee brands is the fact that currently, certification is the only step in the coffee value chain in India that 'segregates coffee'. In the conventional market, coffee from various estates is pooled together and exported (or sold in the domestic market) as a single consignment of coffee. At present, the conventional market offers little traceability, the exception being corporate plantations and few private growers who either sell to or have created their own specialty coffee brands. Few will evaluate their coffee for quality, flavor and aroma profiles and grade the beans based on bean size and type and are remunerated for superior quality. Given that most producers are not typically rewarded for investment (both time and capital) into the estate, Rainforest Alliance certification is perceived as being 'in-road' into the specialty arena and reinforced beliefs amongst growers that "My estate's coffee is of higher quality than my neighbours" (CF-11)

This is particularly relevant because at the time of this study, numbers of coffee plantations that had joined shade-grown certification were considerably fewer than those who had not. According to interviewee's, investment (either manpower or capital) should be taken into account in the traceability process such that coffee produced by a farmer who invests higher time and manpower in his estate should be differentiated from farmers who invest less. For example, a grower commented,

> "Certification makes sense. We need to get ahead of the rest of the growers. Other growers take time to realise it is necessary. Certification will make me known to public" (CF-17).

By signing on to an "international treaty" (CF-2), farmers feel they have a stronger chance to gain visibility and recognition in the value chain compared to if their coffee was sold "anonymously" (CF-18) in the domestic market.

The experience of a lack of identity and hence the motivation to build Kodagu coffee is reinforced by the fact that the geographic identity of coffee is lost in the current value chain and marketing process. In the conventional market, coffee growers are provided negligible information about their coffee once it is sold at the farm gate. Once stock is sold to local traders, traders sell onwards to larger traders and the average farmer has no knowledge whether their coffee is exported or retained in the domestic market or the profit margins that different actors make across the value chain. In comparison, certification is one of the only mechanisms through which farmers in Kodagu are able to receive some traceability through to consumers, i.e. the "Frog stamp (referring to the Rainforest Alliance logo) on coffee packets" that indicates certified coffee and is "the closest we have to a brand" (CF-35). Coffee growers repeatedly mention this connection to global trends especially given a strong feeling of "We are getting left behind" (NCF[8]-30). For example, interviewees comments such as,

> "We don't own our coffee beyond the farm gate so it's good to get an identity and traceability" (CF-15).
>
> or: "The world should know about Kodagu coffee. Maybe certification is not the best way but there is no other way currently" (CF-48).

The positioning of shade-grown certification in the market place has had significant implications for how coffee growers have perceived the incentives to participate. Buyers of Rainforest Alliance certified coffee have the unique position of being the only players in the market that appear to connect local coffee growers to global coffee trends and this holds a great deal of traction amongst farmers in the Kodagu landscape. At present, there is little provision for maintaining identity for farmers, both individually as single-estate or collectively. Coffee from India has little platform in international markets and Kodagu coffee is even less known, despite the biodiversity value of estates and the increasing market share of shade-grown and Rainforest Alliance certified coffees. The experience of loss of identity and perceived disempowerment appears to be an important driver of engagement in "alternative" or "special" market opportunities, such as shade-grown certification (CF-20). Farmer's desires to use certification as a platform to obtain recognition is characterised by the following comments:

> "I feel there are benefits and we would be in the international market and our coffee would get recognized" (CF-16)
>
> "I have a name so why should my coffee be nameless?" (CF-43).

Primary motivations concerning the desire to improve coffee quality through certification seem to be strongly linked to intrinsic motivations, such as elevating the identity and status of coffee from the Kodagu region and keeping abreast of global trends for the inherent value in doing so. However, coffee growers also realize that certification and related market opportunities may also bring added economic benefits at some point in the future. Shade-grown certification is also seen as a mean to better market access, a "stepping stone" (CF-4) to achieve greater economic security and price stability. In this context, it is important to specify that perceptions on 'future economic benefits' is not limited to short-term

[8] Non-Certified Farmer

financial gains from price premiums but incorporates a much broader experience of economic security. Firstly, farmers are of the view that being accredited by international agencies like Rainforest Alliance could facilitate coffee exports. Better market access would most certainly translate into higher prices for coffee from Kodagu. However, in most cases, Kodagu planters aspire for a niche market for Kodagu coffee with guaranteed buyers especially during times when the demand and market price for coffees from India is unfavourable. The following explanations express the motivations of a particular farmer vis-á-vis shade-grown certification and future market benefits:

> "I joined certification because it may give me better market access in the future" (CF-6).
>
> "I felt that in the future when prices drop we would have a niche market and then as certified growers we will have some bargaining power" (CF-26).

From the perspective of growers, 'better' and more secure market access is seen equally as a scenario of guaranteed buyers and stable prices as it is seen as a case of 'high' prices. The issue of future rather than actual benefits is crucial because current economic realisations from certification have been modest. Linked to this aspect of a niche market is the fact that growers perceive certification as also providing them a 'stable' market that buffers against price fluctuations or at the least provides a minimum price, exemplified by the following comments:

> "We want a stable market because our local price is too up and down. When I joined, I thought certification will give me this" (CF-11).

This perception of imagined price stability is crucial to the 'buy-in' for shade-grown certification. However, despite economic motivations to join certification, it is worth highlighting that these motivations are imagined at a non-specific time in the future. Coffee growers do not describe expected returns within a specific timeframe of 1 year or 5 years but instead acknowledge that economic returns could accompany the upgraded status of Kodagu coffee.

Overall, the decision to join Rainforest Alliance certification derives from a combination of intrinsic and extrinsic motivations over the long-term, rather than short-term motivations for cash payments: (a) desire to strengthen identity, elevate status and be visible in the marketplace and as a result of this (b) imagined economic security at a non-specific time in the future.

3.4 Participation to upgrade farm management (22.85%):

For many coffee growers, intrinsic motivations to upgrade farm management is at the root of decisions to participate in Rainforest Alliance certification. Certification is perceived as a way of advancing to a more 'professional-looking' (CF-13) farm management practice especially since standards require the implementation of certain management systems. For example, a certified grower commented about the experience of certification such that,

> "I joined because I wanted my farm to look like a company estate. I have put signboards near the storage room, drying yard and pulper. It is a pleasure to go around my estate" (CF-26).

The aspirations for a 'professional' farm are strengthened in due part because certification requires financial and accounts management. Prior to certification, many producers did not maintain detailed records of farm expenditures (such as input costs, transportation, loans etc.). However, certification standards require that farmers maintain accounts books, daily wages records and other aspects of farm management in addition to maintaining records of wildlife sightings. While, some producers see these requirements as burdensome, many others perceive these changes to the farm as a step towards improved farm management. Farmers aspire to such systems which are most frequently observed in "company-type plantations" (CF-11) and comment such as,

> "I joined to learn how to start good book-keeping system" (CF-13).
>
> "We did certification to learn how to maintain our accounts" (CF-31).

Certification is therefore seen as a process that results in capacity-building of participants. In addition to learning how to maintain records, farmers are motivated by the orderliness implemented as part of the certification process. Rainforest Alliance standards stipulate norms on disposal of plastic and other waste such that waste can only be disposed is designated areas on farm. The standards state that farms must be "...clean and free of accumulation of waste in order to maintain a positive image and contribute to worker's wellbeing" (SAN 2010:5). In describing his motivation to join certification, a producer said,

> "The 'look' of my estate was an important factor affecting my decision. I don't like plastic and waste all over my farm and all certified farmers are clean farmers" (CF-26).

Many participants convey their pride about maintaining a well-kept and neat (CF-1) farm through which their own capacities to streamline production processes, including maintaining farm accounts and records is significantly enhanced. While the primary purpose of certification may not be to build capacity, the possibility of such outcomes is an important factor in peoples' decisions to participate.

3.5 Participation for belief in environmental and social merits (5.71%):

Coffee producers who had joined shade-grown certification also mentioned that they were motivated by an intrinsic belief in the environmental and social merits of the programme. For example, growers are quoted saying,

> "I opted to be Rainforest Alliance certified because I want my land to be more acceptable. Coffee demands nature-unfriendly activities but most times planters who are keen to adopt environmental practices do not get the opportunity to make a real difference" (CF-2).

Coffee producers mentioned that they were already committed to social welfare and environmental conservation and felt that certification could be an opportunity to act on their inherent interests in sustainable production. However, it appeared that most coffee growers who were motivated by the merits of certification were more aligned to the social welfare rather than environmental standards. In fact, many of those who described their inherent interests in conservation were engaged in conservation-related activities prior to certification.

With regards to incentives to participate in certification, the environmental and social

principles (although mostly social standards) appear to have resonated with some coffee farmers and the opportunity to participate in ethical or sustainable farming has in itself been an incentive to join the programme.

As such, the focus of coffee growers was on enhancing farm productivity and revenue generation and cash payments from conservation projects was perceived as an incentive only if there was a tangible link to increased farm value. In this regard, it is striking that 42.85% (n=142) of certified respondents in the district said that they would be willing to adhere to the environmental requirement specified by shade-grown certification guidelines irrespective of the cash incentive. In fact, many farmers expressed a hypothetical preference for 'in-kind' benefits from conservation. Some growers explained that 'in-kind' benefits such as technical support on coffee varieties, fertilisers, pest control methods and infrastructure support such as the provision of weed-cutters and harvesting tools would be preferred over cash premiums. For example, farmers said,

> "Other things are more important. I would have prefer developmental benefits" (CF-11).

3.6 Growing discontentment

Despite extrinsic or intrinsic motivations to participate in shade-grown certification, there appears to be growing discontent with certification amongst participating coffee growers. In Kodagu, certification schemes are not seen as win-win or mutually beneficial arrangements. On the contrary, such incentive schemes are seen as designed to serve conservation interests without fully engaging with the motivations of natural-resource users. The implications of the disconnect between the provision of direct incentives and a more diverse set of motivations is that such conservation projects are disregarded by coffee growers as half-hearted attempts to involve people in conservation efforts on their own farms. In this context, people's vision for coffee production is met with a single delivery of cash payments. We observe growing skepticism, mistrust and a rejection of conservation ideas that could eventually lead to a crowding out of inherent motivations for sustainable coffee production. For example, coffee growers participating in certification will comment that they are affronted by being given cash incentives saying such price premiums for Rainforest Alliance certification with being "thrown cash" (NCF-45). For example, a producer who had chosen to opt out of certification said,

> "I'm too proud of my land for someone to throw cash at me and expect me to do what he says. They don't want to involve us. They just want to silence us with cash" (NCF- 19).

Other participants who were disappointed with the certification process commented as follows,

> "I thought certification is a long-lasting relationship for coffee improvement. But they are only giving me cash premium" (CF-98).
>
> "They are throwing cash at my face and saying goodbye" (CF-50).
>
> "We want a better future and they are giving cash. Naturally we will become anti-environment" (CF-12).

This last statement about becoming 'anti-environment' is important because it reflects a growing disenchantment with conservation projects in the region. Amongst participating

coffee growers, there is dejection about certification that comes from (a) numerous unmet expectations that are (b) reduced in certification policies as price premiums. The result is both an explicit and subtle rejection of conservation projects and ideas that coffee growers may have ordinarily agreed to. Examples of outright conservation rejection are comments such as,

> "All environmentalists are mentalists. I will protest against all environmental projects" (CF-59).
>
> "Certification is one-way traffic. We follow their guidelines and they can sell coffee in the international market but they only give cash and I told them I don't want cash and I don't want conservation" (CF-18).

In response to peoples' participation in conservation projects beyond Rainforest Alliance certification but concerning shade-grown farming and ecological restoration, a coffee grower said,

> "Certification has turned my mind away from all environmental work. I am no more interested in wildlife and junglewood trees. You better talk to some planter who did not do certification" (CF-33).

4. Discussion

The results presented in the previous section present the core response to the research questions and hypothesis concerning what motivates natural-resource users to engage with market-based incentives for conservation and whether extrinsic motivators like direct payments can shift behavior towards more environmentally-friendly production practices. Literature on incentive-based conservation would argue that direct incentives in the form of conditional monetary payments are assumed to be the strongest motivators of human behavior change (Ferraro 2001, Ferraro and Kiss 2002). Despite counter-arguments the uptake of direct incentives into mainstream policy discourse indicates widespread buy-in and support for such initiatives. In the context of agri-foods, the underlying logic expressed in global discourses driven by certification agencies like Rainforest Alliance, Smithsonian Bird-Friendly, UTZ-Certified, Organic or Fair Trade is that such environmental and social justice can be achieved through positive incentives like price premiums.

In contrast, empirical evidence collected through semi-structured and open-ended interviews with coffee growers participating in shade-grown certification in Kodagu, shows that perceptions of coffee growers differ considerably from inbuilt assumptions in policy and theoretical discourses on market incentives. For example, coffee growers are seen to participate in shade-grown certification rooted in many motivations. Farmers' motivations include (a) receipt of immediate price premium; (b) an expectation of improved knowledge and eventually enhanced coffee quality; (c) expectation of elevated status of Kodagu coffee and promotion of local identity through specialty coffees; (d) building capabilities for streamlined farm management and imbibing a 'well-kept' farm culture and inculcation of a streamlined and systematic cultivation practice; (e) belief in environmental and social merits of shade-grown certification. Some of these motivations are economic, but also intrinsic, in the sense that these are about the pride of the producer in their cash crop production system.

In Kodagu, coffee growers adhere to the rules of certification not for economic reasons but rather for capacity-building and increased knowledge. This is consistent with many other examples of PES. For example, Ryan et al. (2003) found that farmers in the mid-west United States were motivated to engage in conservation of riparian corridors (including maintaining woody vegetative buffers) because of intrinsic motivations rather than economic compensation, such as making their farm appear well managed (see Section 3.3). Greiner and Gregg (2011) observed that cattle ranchers in Northern Australia held a diversity of motivational profiles such as strong conservation ethic that was not being considered in the design of policy instruments. Deci et al. (1999) made a similar conclusion about motivations to conserve from self-interest and pride from a meta-analysis of studies on intrinsic and extrinsic motivations.

These findings challenge theoretical assumptions about the power of direct incentives in three related ways. Firstly, coffee growers are incentivised to adopt shade-grown standards based on a combination of extrinsic and intrinsic motivations. These include improved knowledge, enhanced coffee quality, elevation of identity of Kodagu coffee in global markets, building capacity for improved farm management and belief in social and environmental merits. The important distinction between empirical observations and theoretical discourses about market-based incentives is that coffee growers in Kodagu believe that economic security should be achieved through long-term mechanisms, such as enhanced quality, elevated status geographically exclusive specialty coffees, rather than short-term, immediate financial arrangements in the form of a price premium or one-off conservation payments. Such expectations of participation in a conservation programme, which we conceptualise as a combination of extrinsic and intrinsic motivations would ideally result in a policies that provide both direct and indirect incentives to farmers. This refutes ideas that argue for the use of simple direct cash incentives as a sufficient way to engaging with landholders; our results indicate that cash incentives should work alongside other motivations.

Secondly, as coffee growers engage with market-based incentives with diverse motivations, they use market incentives as stepping stones to achieve a wider set of goals more aligned to their vision than the immediate objectives of Rainforest Alliance certification. These broader goals comprise substantial and meaningful participation in the governance of coffee value chains and the elevation of the status of Kodagu coffee. These goals also include greater power in the negotiation with the Indian state regarding resource use rights, particularly with relevance to trees on coffee farms.

Finally, with regards to conservation perceptions, we find that direct incentives are not perceived as 'farmer-friendly incentives' (Siedenburg et al. 2012). While coffee growers are motivated by a range of intrinsic and extrinsic motivations to participate in Rainforest Alliance certification, the certification programme seems to over-simplify peoples motivations by only recognizing extrinsic motivations and thus incentivizing growers through direct payments. Therefore meeting a diverse and mottled set of motivations with a narrow delivery of cash incentives results in potential crowding out effects in which

coffee growers reject ideas about conservation, including their participation in additional conservation activities. For many coffee producers, the certification price premium is seen as offensive because of fundamental design and policy weaknesses that do not take into account the wider set of intrinsic motivations that drive people to participate in conservation activities. While beliefs in the social and environmental merits of certification or inherent conservation sentiments constitute some of these inherent motivations, coffee producers in Kodagu also assign a range of other values to Rainforest Alliance certification that influence their desire to join certification.

5. Conclusions

In this way, the experience of coffee growers in Kodagu and the ways in which they engage with market-based incentive programmes, highlights the disconnects between theoretical assumptions about using direct incentives to address extrinsic motivations for conservation and field-level realities of how and why natural-resource users actually choose to engage with market- based conservation initiatives. These research findings also reinforce the importance of intrinsic motivations in addition to immediate cash motivations, including strengthening identity, capacity-building and upgrading farm management, and socio-cultural wellbeing as powerful motivators of land-use change. Finally, this paper argues that failing to recognize the complex of intrinsic and extrinsic motivations based on which landholders make decisions about conservation, leads to a potential crowding out effect wherein motivations to participate in future conservation projects are weakened.

Instead, we argue for 'farmer-friendly' incentives that recognize the diversity of expectations that landholders have out of their engagement in conservation activities. We propose that certification schemes, such as that of Rainforest Alliance should tailor-make their incentive structures to better align with farmers' aspirations and goals from the project. A first step towards designing such incentives would be to gather and analyse information on the motivations of local landholders, including their expectations from conservation projects. Subsequently, the design of standards and incentives could be modified to address these motivations and thereby place the interests and aspirations of farmers at the core of the agenda (Garcia et al. 2010). For example, in this specific case, Rainforest Alliance certification would gain greater local support and increased participation by taking the following into account in their standards:

(a) detailed quality analysis and consultation on coffee quality improvement with participating coffee growers (including analyses of quality and farm management parameters such as shade tree densities and chemical inputs);

(b) greater traceability and chain of custody from farm-level to retailer across Rainforest Alliance certified coffees;

(c) further capacity-building on various aspects of value-addition to coffee (such as improved pulping techniques, community-pulpers, facilitating farmer collectives or co-operatives) and;

(d) strengthening communication about the environmental and social goals of certification, including monitoring and sharing impacts of certification with participating coffee growers.

This would gain much greater traction with local landholders thereby expanding the reach and effectiveness of such programmes. Finally, such farmer-friendly incentives would have a higher chance of ensuring continuous support for conservation activities by taking into account of potential crowding out of peoples' interests that can result from a disconnect between conservation design and peoples' desires.

6. References

Barrett, C. B., D. R. Lee and J. G. McPeak (2005) Institutional arrangements for rural poverty reduction and resource conservation, *World Development*, 33(2): 193-197.

Bhagwat, S., C. G. Kushalappa, P. H. Williams and N. Brown (2005) The role of informal protected areas in maintaining biodiversity in the Western Ghats of India, *Conservation Biology*, 19: 1853-1862.

Bhagwat, S., K. J. Willis, J. B. Birks and R. J. Whitaker (2008) Agroforestry: a refuge for tropical biodiversity, *Trends in Ecology and Evolution*, 23(5): 261-267.

Bhagwat, S. A. and C. Rutte (2006) Sacred groves: potential for biodiversity management, *Frontiers in Ecology and the Environment*, 4(10): 519-524.

Bryant, R. L. (1992) Political ecology: an emerging research agenda in Third-World studies, *Political Geography*, 11(1): 12-36.

Corbera, E., N. Kosoy and M. M. Tuna (2007) Equity implications of marketing ecosystem services in protected areas and rural communities: Case studies from Meso America, *Global Environmental Change*, 17: 365-380.

Daily, G. C. and P. A. Matson (2008) Ecosystem services: From theory to implementation, *Proceedings of the National Academy of Sciences*, 105(28): 9455-9456.

Deci, E. L., R. Koestner, and R. M. Ryan. 1999. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin **125:**627–668.

Depommier, D. (2003) The tree behind the forest: ecological and economic importance of traditional agroforestry systems and multiple uses of trees in India, *Inernational Society for Tropical Ecology*, 44(1): 63-71.

Desjeux, Y. (1999) Contribution des arbres d'ombrages des caféiers à l'approvisionnement en bois de feu des petits planteurs du Coorg,(Karnataka, Inde du Sud), *Mémoire de fin d'études, ENITA*.

Engel, S., S. Pagiola and S. Wunder (2008) Designing payments for environmental services in theory and practice: An overview of the issues, *Ecological economics*, 65(4): 663-674.

Ferraro, P. J. (2001) Global habitat protection: limitations of development interventions and a role for conservation performance payments., *Conservation Biology*, 15: 990-1000.

Ferraro, P. J. and A. Kiss (2002) Direct payments to conserve biodiversity, *Science*, 298: 1718-1719.

Fisher, J. (2012). No pay, no care? A case study exploring motivations for participation in payments for ecosystem services in Uganda. *Oryx*, *46*(01), 45-54.

Frey, B. S. and R. Jegen (2001) Motivation crowding theory, *Journal of Economic Surveys*, 15(5): 589- 611.

Frey, B. S. and F. Oberholzer-Gee (1997) The cost of price incentives: An empirical analysis of motivation crowding-out, *The American Economic Review*, 87(4): 746-755.

Garcia, C., S. Bhagwat, J. Ghazoul, C. D. Nath, K. M. Nanaya, C. G. Kushalappa, Y. Raghuramulu, R. Nasi and P. Vaast (2009) Biodiversity conservation in agricultural landscapes: challenges and opportunities of coffee agroforests in the Western Ghats, India, *Conservation Biology*, 24(2): 479- 488.

Ghazoul, J., C. Garcia and C. Kushalappa (2009) Landscape labelling: a concept for next-generation payment for ecosystem service schemes, *Forest Ecology and Management*, 258(9): 1889-1895.
Greiner, R., & Gregg, D. (2011). Farmers' intrinsic motivations, barriers to the adoption of conservation practices and effectiveness of policy instruments: Empirical evidence from northern Australia. *Land Use Policy*, *28*(1), 257-265.
Kolk, A. (2011) Mainstreaming sustainable coffee, *Sustainable Development*, 21(5).
Kolk, A. and R. Van Tulder (2005) Setting new global rules?, *Transnational Corporations*, 14(3): 1-17.
Leroy, M., C. Garcia, P. Aubert, V. Jeremy, C. Bernard, J. Brams, C. Caron, C. Junker, G. Payet, C. Rigal and S. Thevenet (2011) *Thinking the Future: Coffee, Forests and People - Conservation and development in Kodagu*, AgroParisTech - ENGREF, Paris.
Mellstram, C. and M. Johannesson (2008) Crowding out in blood donation: was Titmuss right?, *Journal of the European Economic Association*, 6(4): 845-863.
Mittermeier, R. A., N. Myers, J. B. Thomsen, G. A. Da Fonseca and S. Olivieri (1998) Biodiversity hotspots and major tropical wilderness areas: approaches to setting conservation priorities, *Conservation Biology*, 12(3): 516-520.
Muschler, R. G. (2001) Shade improves coffee quality in a sub-optimal coffee-zone of Costa Rica, *Agroforestry Systems*, 85: 131-139.
Myers, N., R. A. Mittermeier, C. G. Mittermeier, G. A. Da Fonseca and J. Kent (2000) Biodiversity hotspots for conservation priorities, *Nature*, 403(6772): 853-858.
National_Informatics_Centre (2011) Official Website of Kodagu District. Retrieved 27 March, 2012, from http://www.kodagu.nic.in/.
Nicholls, H. (2004) The conservation business, *PLoS Biology*, 2(9): 1256-1259.
Peet, R., P. Robbins and M. Watts (2010) *Global Political Ecology*, Taylor & Francis US.
RA (2012) Mission Statement of the Rainforest Alliance. Retrieved 02/04/2012, from http://www.rainforest-alliance.org/about.
Rao, V. (2011) *Impact of Grevillea robusta Composition on Bird Diversity in Coffee Plantations in Cauavery Watershed Area of Coorg District*, French Institute of Pondicherry, Pondicherry.
Rare (2015) Pride Campaigns. URL: http://www.rare.org/pride#.VR-sPin0fds. *Last accessed 4/4/2015.*
Ryan, R. L., Erickson, D. L., & De Young, R. (2003). Farmers' motivations for adopting conservation practices along riparian zones in a mid-western agricultural watershed. *Journal of Environmental Planning and Management*, *46*(1), 19-37.
SAN (2010) *Sustainable Agriculture Standard*, Sustainable Agriculture Network: San Jose, Costa Rica.
Sandel, M. J. (2012) *What Money Can't Buy: The Moral Limits of Markets*, Penguin: London.
Siedenburg, J., A. Martin and S. McGuire (2012) The power of "farmer friendly" financial incentives to deliver climate smart agriculture: a critical data gap, Journal of Integrative Environmental Sciences, 9(4): 201-217.
Sommerville, M. M., J. P. Jones and E. Milner-Gulland (2009) A revised conceptual framework for payments for environmental services, *Ecology and Society*, 14(2): 34.
UNESCO (2013) Twenty-six New Sites Inscribed on UNESCO World Heritage List: Western Ghats. Retrieved 30/12/2013, from http://whc.unesco.org/en/list/1342/.
Vaast, P., R. Van Kanten, P. Siles, B. Dzib, N. Franck and J. M. Harmand (2006) Shade:

a key factor for coffee sustainability and quality, *Association for Science and Information on Coffee*: 887-896.
WWF (2015) WWF's Programme on Education for Sustainable Development, URL: http://wwf.panda.org/what_we_do/how_we_work/people_and_conservation/our_work/education_for_sustainable_development/. *Last accessed 4/4/2015*.
Zimmerer, K. S. and T. J. Bassett (2003) *Poltiical Ecology: An Integrative Approach to Geography and Environmental-Development Studies*, Guilford Press, London.

Garcia, C. A., S. A. Bhagwat, J. Ghazoul, C. D. Nath, M. N. Konerira, K. G. Cheppudira, Y. Raghuramulu, R. Nasi, and P. Vaast. 2010. Biodiversity conservation in agricultural landscapes: challenges and opportunities of coffee agroforests in the Western Ghats, India. Conservation Biology **24**:479-488.

Kilian, B., C. Jones, L. Pratt, and A. Villalobos. 2006. Is sustainable agriculture a viable strategy to improve farm income in Central America? A case study on coffee. Journal of Business Research **59**:322-330.

Kleijn, D., F. Kohler, A. Báldi, P. Batáry, E. Concepción, Y. Clough, M. Diaz, D. Gabriel, A. Holzschuh, and E. Knop. 2009. On the relationship between farmland biodiversity and land-use intensity in Europe. Proceedings of the royal society B: biological sciences **276**:903-909.

Kleijn, D., and W. J. Sutherland. 2003. How effective are European agri-environment schemes in conserving and promoting biodiversity? Journal of applied ecology **40**:947-969.

Marie-Vivien, D., C. A. Garcia, C. G. Kushalappa, and P. Vaast. 2014. Trademarks, Geographical Indications and Environmental Labelling to Promote Biodiversity: The Case of Agroforestry Coffee in India. Development Policy Review **32**:379-398.

Muradian, R., and W. Pelupessy. 2005. Governing the coffee chain: The role of voluntary regulatory systems. World Development **33**:2029-2044.

Muschler, R. G. 2009. Shade Management and its Effect on Coffee Growth and Quality. Pages 391-418 in J. N. Wintgens, editor. Coffee: Growing, Processing, Sustainable Production. Wiley-VCH Verlag GmbH.

Pierrot, J., D. Giovannucci, and A. Kasterine. 2010. Trends in the Trade of Certified Coffees. International Trade Centre Technical Paper.

SAN 2010. Sustainable Agriculture Standard. Sustainable Agriculture Network, San Jose, Costa Rica.

Staver, C., F. Guharay, D. Monterroso, and R. Muschler. 2001. Designing pest-suppressive multistrata perennial crop systems: shade-grown coffee in Central America. Agroforestry Systems **53**:151-170.