Cultivating Nature

A study of land use and Fairtrade coffee farming in Costa Rica

Photo by Miron M. Arljung

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Abstract
This thesis is a comparative study of three coffee producers in the San José region of Costa Rica, who either are or have been Fairtrade certified. The purpose is to examine the land use models of the coffee farmers and to analyse what impact Fairtrade certification has had on the choice of these. The theoretical framework was based on the concept of land sharing and land sparing as a way to understand the existence and function of non-commercial plants within the farmland on the one hand and the relationship between agriculture and nature on the other. Participatory mapping and semi-structured interviews were conducted among farmers in the Santa Elena community, together with interviews with representatives from the cooperatives, the department of agriculture and more. The results show that most farmers don’t identify their land use as belonging to any particular strategy but nevertheless use intensive cultivation with chemical fertilisers and pesticides. Monoculture and polyculture exists and non-commercial trees could be found on both types of farms, with the main purpose of providing shade for the coffee. A dichotomy between agriculture and nature appears to be common, which would mean that a more land sparing philosophy is prevalent. Only one organic farmer showed clear signs of land sharing practices with an emphasised synergetic approach with focus on ecosystem services. In conclusion, it seems like Fairtrade certification affects these types of land use mostly in an indirect manner, working mainly with the cooperatives who then primarily work with aspects like regulated chemical use. It also appears that the producers who seek out certification are either those who high altitude farmers who can live up the quality standards and/or those who already share common principles with Fairtrade, leading to marginal changes in land use after certification

Keywords:
Costa Rica, coffee, cooperative, agriculture, land use, land sharing, land sparing, sustainable, environment, conservation, organic
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Abbreviations

GVC    Global Value Chain
FT     Fairtrade
CA     CoopeAgri R.L.
CD     CoopeDota
CT     CoopeTarrazú
PES    Paying for Ecosystem Services
ICDP   Integrated Conservation and Development Project
INGO   International Non-Governmental Organisation
MAG    Ministerio de Agricultura y Ganadería (The Costa Rican agricultural department)
RA     Rainforest Alliance
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1. Introduction

Since colonial times, coffee has to a large extent been consumed in other parts of the world than where it is grown (Rueda & Lambin, 2013). To this day, coffee continues to be one of the world’s most traded agricultural commodities and employing a large number of the world’s poor small-holder farmers. As a result of specific environmental conditions necessary to grow the crop, including altitude above sea level and annual precipitation levels, coffee can only be grown in certain areas of the world (Sick, 2008). Many of these areas have tropical climates and biodiverse rainforests which have been and continue to be under potential threat from expansion of conventionally run farms characterised by intensive land use. The common use of chemicals at such plantations often lead to contaminated waterways and reduced biodiversity levels on farms as well as illnesses among coffee workers (Lyngbaek, Muschler, & Sinclair, 2001). Because of these kind of negative associations, coffee was one of the first commodities to become involved in different certification practices (Potts et al., 2014), a labelling of product that in different ways seek to improvement in either the social, environmental or sometimes both of these areas.

Starting with the Max Havelaar label in 1988 and the notion of utilising purchasing power as a contributing force for economic and social improvement for the workers, certification as a method began to expand and eventually lead to the founding of the Fairtrade Labelling Organizations (FLO) in 1997. Amongst their many products, coffee is one of the largest in terms of quantities of sale (FLO, 2016a). Through the international trading channels or global value chains (GVCs), organisations like Fairtrade (henceforth abbreviated FT) link agricultural producers and customers together, but it is not only money which is transferred but also ideas and values. In case of certifications who clearly lobby for certain values, Goodman (2004) writes about the creating a “moral economy”; in this fashion, land use practices are influenced not only by local conditions but in an increasing manner also by customer preferences and market forces operating together (Rueda & Lambin, 2013).

A coffee farm could then be seen as spaces where all three aspects that are normally included in the “sustainability” concept (economy, social conditions and the environment) are expected to be improved. This is not given, especially since there has been a tradition Western discourse which defines “nature” as something static which is characterised being untouched by human impact (West, Igoe, & Brockington, 2006), leading to a dichotomising way of viewing agricultural land and natural conservation in a mutually excluded manner (Jackson, Pascual, Brussaard, de Ruiter, & Bawa, 2007). From a geographical perspective, it is then interesting to analyse how the act of creating these binary spaces changes people's perception of both nature and of themselves (West et al., 2006) and what impact this can have on agricultural land use.

As a contrast to this paradigm of viewing nature and agriculture as separate, the topic of agricultural and ecological synergies has given rise to a number of different concepts and terminologies. One example is “agrobiodiversity” which refers to ecosystem services that have a direct positive impact for the farmer (Jackson, Pascual, & Hodgkin, 2007). Still, given the practical economic realities of present market institutions, agrobiodiversity or other natural values within the farmland often needs some form of monetary value that can be captured for any substantial land use change to occur (Pascual & Perrings, 2007). This logic focuses the discussion of potential solutions to mechanisms to centre around compensation, though there are people like Scherr & McNeely (2008) who advocate strategies like “ecoagriculture” or agroecology, which includes mixed land usage where
parts of the farmland are made to emulate natural habitats which create a win-win situation where there’s no need for compensation because nature and agriculture create synergies.

Costa Rica provides an interesting case study where it is possible to examine these types of land use paradigms because of a number of reasons. First, it is a country which have traditionally been reliant on agricultural commodities for its GDP, where crops like coffee became an important source of revenue (Sick, 2008). It is a country which had one of the fastest deforestation rates in the world (Daniels, Bagstad, Esposito, Moulaert, & Rodriguez, 2010), where forest clearing to make room for crops or cattle was one of the major contributors (Pagiola et al., 2004). It is thus easy to find examples of the type of dichotomy which can exist between agriculture and nature described. Second, some major changes took place in the latter half of the 20th century that are directly related to both farming and natural conservation. Through new legislation and other societal developments, Costa Rica has become known for having 25% of the country’s forest and natural under some form of protective status (Daniels et al., 2010). At the same time, agriculture's share of GDP dropped from around 30% to 5% (World Bank, 2013) and the coffee market changed from being regulated by an international coffee agreement (ICA) to free trade quotas and higher levels of competition and lower prices (Sick, 2008).

This has created a situation where 1) Many coffee farms that remain are located near areas of natural protection, leading to ample opportunities to study the borders, relationship and interaction between these two land uses, and 2), the fierce competition from major coffee producers like Brazil has meant that Costa Rica’s farmers have increasingly turned to high quality niche markets and certification schemes like FT, being the 5th largest producer of FT-coffee (FLO, 2016a).

1.1 Purpose and research questions
The purpose of this thesis is to do a comparative study of four coffee producers, that either are or have been Fairtrade certified, in order to determine what impact certification has on their land use practices. This leads to the following two research questions:

1. What kind of agricultural land-use models or strategies are the coffee farmers using?
2. To what extent does Fairtrade certification influence the farmers’ choice of these?

1.2 Delimitations
Space: Three locations have been chosen for comparative studies:

<table>
<thead>
<tr>
<th>Place</th>
<th>Coffee producer</th>
<th>Type of Agriculture</th>
<th>Present Certification(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Elena</td>
<td>CoopeAgri</td>
<td>Conventional</td>
<td>Fairtrade</td>
</tr>
<tr>
<td>Santa Maria de Dota</td>
<td>CoopeDota</td>
<td>Conventional</td>
<td>Rainforest Alliance &amp; CO2 neutral</td>
</tr>
<tr>
<td>San Marcos</td>
<td>CoopeTarrazú</td>
<td>Conventional</td>
<td>Fairtrade, Rainforest Alliance, C.A.F.E. Practices (Starbucks)</td>
</tr>
<tr>
<td>Pérez Zeledón</td>
<td>Madre Tierra</td>
<td>Organic</td>
<td>Fairtrade</td>
</tr>
</tbody>
</table>
1. **Santa Elena**: a small farming community in the province of Pérez Zeledón, located within the San José region in central Costa Rica. Pérez Zeledón is the operating space of the farming cooperative CoopeAgri R.L. (henceforth abbreviated CA). CA lists a number of environmental initiatives on their website, including conservation projects, reforestation, agroforestry and water management/treatment facilities. Apart from coffee CA also produces other crops like sugar cane (CoopeAgri, 2015a) and since 2005 they also have a collaboration with Fairtrade (FLO, 2015). Santa Elena is located right next to the Alexander Skutch Biological Corridor, a 124 ha area of rainforest which in turn is adjacent to Chirripó National Park and La Amistad International Biosphere Reserve. The corridor is managed through a partnership with York University and the Tropical Science Centre (a Costa Rican NGO) in what is called the Las Nubes Project. This closeness to areas of natural protection makes it possible to enquire whether or not the farmers feel there is any conflict of interest between agriculture and nature and if it affects their land use strategies/models.

2. **Santa Maria de Dota** and **San Marcos** are two coffee growing communities home to two cooperatives, CoopeDota (henceforth abbreviated CD) and CoopeTarrazú (henceforth abbreviated CT) respectively. Like Santa Elena, both of them are situated close to a national park, in this case “Los Quetzales”.

3. **Madre Tierra**: a small organic coffee producer consisting of six farmers who have joined together to process and export their own coffee brand. Madre Tierra (henceforth abbreviated MT) have a so called “micro factory” is located a few kilometres north of San Isidro de el General in Pérez Zeledón.

**Time**: Although a historical perspective is useful to provide context, the time window for this study will be mainly the years 1989 - 2015. This allows a capturing of changes that happened since the disbandment of the International Coffee Agreement (ICA) which had a large impact on price levels and thus the economic realities of the farmers (Kilian, Jones, Pratt, & Villalobos, 2006).

**Subject matter**: There are many dimensions that are of relevance to this study: economics, politics, biology, agronomy etcetera. Since this thesis is written within the discipline of human geography, it means that the focus will be on the socioeconomic conditions of the farmers. Previous research of land use, natural protection schemes and the international coffee market will be used to provide context.

### 2. Theoretical background

Like any study into the three pillars of sustainable development, this paper will examine and analyse both environmental, social and economic issues. Because of this, there is not any particular grand theory that will be the theoretical foundation of this thesis. Instead, relevant concepts, basic assumptions and paradigms will be reviewed in this chapter. Chief among these is the concepts of “land sparing” and “land sharing” which are explained further in chapter 2.3.2.

#### 2.1 Basic assumptions

**2.1.1 The need for intensified production**

Several researchers view intensified land use is seen as the best method of increasing agricultural yields without having to increase the cultivated area (Pagiola and Holden, 2001). This kind of reasoning is partly based on the negative environmental results that can result from extensive
farming, chief among them deforestation and associated release of CO2, loss of ecological habitats and changes in runoff rates (Jackson, Pascual, Brussaard, de Ruiter, & Bawa, 2007, p. 193).

Although intensification can be one way of dealing with the negative environmental aspects associated with certain forms of agricultural land use, this method relies among other things, on the availability of and benefits from applying modern technological farming techniques. This approach is not without its critics. As Angelsen and Kaimowitz (2001, p. 89) put it: “The belief that technological progress in agriculture reduces pressure on forests by allowing farmers to produce the same amount of food in a smaller area has become almost an article of faith in development and environment circles. (...) At the same time, basic economic theory suggests that technological progress makes agriculture more profitable and gives farmers an incentive to expand production on additional land”. Still, there appears to be few researchers who outright challenge the intensification paradigm. Instead, the more common approach is to not refute intensification as a goal as much as criticise the manner in which it is achieved, for example by applying ideas such as food sovereignty (Patel, 2009) to supplement the production focus with a more social dimension.

One basic problem which becomes apparent in the paragraphs above is that they, like most literature that deals with agriculture, are chiefly concerned with food crops (though sometimes this is broadened to include cattle farming). Perfecto & Vandermeer (2010) point out that cash crops like coffee have quite different sets of circumstances pertaining to their production. These include an already saturated market with accompanying low prices; more intensified production would in this case worsen the economic situation for the farmers by lowering the price (and their income) even further. Another important difference between food and cash crops, that is especially relevant where coffee is concerned, is that cash crops often are grown under different environmental conditions than for example corn or maize (D’haeze, Deckers, Raes, Phong, & Loi, 2005). A discussion purely about food crops thus limits the thematic scope to certain geographical areas, while also failing to acknowledge the importance of cash crops for the livelihood opportunities of many poor farmers in low-income countries. Another issue with the food oriented articles is that researchers like Aerni (2011), seem to express neo-Malthusian concerns about global population growth and society's collective ability to produce enough food in the future to feed all. This problem description is debatable as some sources claim there already is capacity to produce more than enough food for the world’s population and that the problems of food security have more to do with food waste, post-harvest losses in many parts of the production chain and limited economic access to food (Padoch & Sunderland, 2013).

There is also a problem concerning the assumption of conventional farming methods as the norm to increase production; reasoning which has not changed since it first appeared during the Green Revolution that followed the many UN conferences about sustainable development in the 1970s (Lee & Barett, 2001). Examples of this reasoning can vary, ranging from those using a more technocratic and free market way of thinking about solutions (Aerni, 2011), to those looking for more institutionalist and “global partnership” solutions (Godfray et al., 2010). The unifying thread however is still very much concerned with a logic of adding more input to the farmland, be that in the form of money, machinery, chemicals (fertilization/pesticides) or large scale landscape change such as irrigation; many of these measures being associated with negative effects on both the environment and human health (Jackson, Pascual, & Hodgkin, 2007).
By being limited to “conventional wisdom” a dichotomy between agriculture and nature is created which helps justify the intent of intensification: it is deemed essential in order to save external land uses that would lead to deforestation. Because of this binary thinking, specific definitions and concepts for both farmland and nature arose that still remain. This in turn has often led to a compensation type approach which in tandem with this “sustainable intensification” couples it with natural conservations measures. However, since farmland and nature as viewed as non-compatible, it leads to a fragmentation of space where nature is being defined largely as areas with little to no human influence. This discourse fails to recognise the fact that human activities have in many cases been instrumental both in creating and later maintaining many biodiverse rich landscapes. Not only do the subsidies and regulatory frameworks reliant on this thinking often fail at protecting nature (which might "degenerate" without human upkeep) but they likewise fail to improve the livelihood opportunities for the people reliant on the land (Harrop, 2007). For example, there are many examples of instances where people have been evicted from their traditional living spaces in order protect nature (Ambinakudige, 2011). West et al., (2006) further argue that top-down conservation efforts like these often can lead to conflicts between the state and the local community as well as stir up tensions within the latter by creating both benefactors and losers of implemented policies.

To summarise, there are powerful economic and political interest behind the formulation of policy and the framing of solutions which one needs to be aware of in order to understand the tensions behind many agricultural and environmental issues.

2.1.2 Farmer logic

An important topic when arguing for different agricultural or environmental schemes and how to implement "sustainable" practices is the assumptions concerning farmer behaviour and priorities. Operating mostly under a free market paradigm, it either implicit or explicit that farmers behave as rational economic agents. For the free market paradigm to work though, a number of conditions must be met like: full ability of every stakeholder to gather and further understand all information needed for informed decision taking, a common ground for assessing and judging the values, the ability to translate these decisions into actions and so forth. The solutions coming from such a system need a monetary foundation for both encourage- and discouragement, which can be both difficult (quantifying relative values) and limiting (leaving out ethical, cultural or other social values).

Pagiola et al., (2004) elaborate on the theme of farmer behaviour by examining two different models that can be used to explain farmer motivation. First, there is the "household subsistence model", where farmers, for various reasons only produce enough to sustain themselves. According to Angelsen & Kaimowitz (2001), this situation is perhaps most relevant when describing more remote villages. Second is the “perfect market/open-economy”-model, which describes a basic capitalist and profit maximising behaviour, more suitable for explaining medium-large size farms. Since few farmers fall neatly into one of these two categories, and the market rarely functions under perfect conditions, Lee et al., (2001) warn about making too grand generalisations about farmer behaviour.

This is especially the case concerning the assumption that the application of technology/techniques will lessen the incentive for areal expansion; the opposite effect is as likely to occur, since technology, especially if it belongs to the labour saving category, can create incentives to expand
farmland/production because the same amount of workers can cultivate more land and thus increase profit. Another similar scenario which might also lead to increased deforestation is also possible: that labour saving technologies, lessening the need of hired labour, creates unemployment amongst the former workforce. These workers then migrate to new areas or "frontiers" where they continue to use their previous expansive practices (Angelsen & Kaimowitz, 2001).

In short, Pagiola et al., (2004) express how it is rarely possible to predict farmer behaviour because of the complexity arising from local factors and the changing of these, which often are the key determinants. This makes it hard for decision makers when they plan and decide on national/general policies and whether or not they are likely to have the desired effect(s).

2.2 Agricultural land-use change

2.2.1 Spatial and temporal dimensions

To study changes in land use is important for many reasons. As Rueda & Lambin (2013, p. 286) put it: "Land is one of the primary assets rural people depend on. Changes in land use are not only crucial for the functioning of natural ecosystems but also for the livelihoods of millions of rural dwellers".

The question of what interactions/processes are possible to examine at a given scale is vital when discussing the validity of any study. Since changes in land use can involve multiple agents and processes which act and interact differently on the micro- and macro level respectively, the choice of scale often is arbitrary and is bound to exclude some important aspects regardless of choice. Thus "The task of modelling sociocultural forces is difficult because humans act both as individual decision makers and as members of a social system. Sometimes these roles have conflicting goals" (Verburg, Schot, Dijst, & Veldkamp, 2004, p. 312-313). Still, it can be of value to know what kind of processes one will discover at the chosen scale, be it individual farm behaviour or a larger focus on landscape.

Turner II et al., (1995 in Verburg et al., 2004) in turn argue that the timeframe used is imperative in distinguishing the processes involved in land use change. The role of thresholds being passed and issues such as different development pathways can make studies which focus solely on present conditions and equilibriums have little meaning. With that under consideration, Dupuy (1991 in Verburg et al., 2004) distinguish between three different groups of driving forces with regards to changes in land use: socio-economic drivers, biophysical drivers and proximate causes.

2.2.2 Processes of land use change

There are a lot of conceptions about potential drivers and processes related to why people chose to alter their land use practices. Lambin, Geist, & Lepers (2003) write extensively about land use change and the many factors involved, but narrow the critical ones down to the following:

1. resource scarcity leading to an increase in the pressure of production on resources
2. changing opportunities created by markets
3. outside policy intervention
4. loss of adaptive capacity and increased vulnerability
5. changes in social organisation, in resource access and in attitudes
Pender et al., (2001) write about similar factors and emphasise the role of geography, in particular the closeness to markets, to determine the sort of crops farmers chose to grow. Not unlike the classic Von Thünen model, Pender et al. argue that cash-crops are more likely to be cultivated in areas close to markets, whereas the opposite is true for subsistence agriculture. Important determinants in this case are, among other things, the availability of production technicians and/or possibility to engage in programmes of different sorts. Expanding this reasoning to conservation measures,

When it comes to grander theories however, a lot of the knowledge that does exist on this topic is based more on assumptions and "myths" than solid empirical data, and much writing is overly generalised across spatial scales (Lambin et al., 2001). Among the more prominent of these myths is the role of demography. While not dismissing the notion that population change does have an impact, Lambin et al. balance the equation by adding the role of socio-economic circumstances, which in turn is closely related with political decisions taken by the government and other powerful actors. Examples of such factors include changing market prices as well as the effects of migration and urbanisation. The latter changes both consumptive patterns (which may be particularly important when domestic production of food stuffs is concerned), but also in actively fragmenting the landscape. With regards to urbanisation, the process of economic globalisation is usually more active in cities in how it links them to together in networks of consumers in other countries and their changing patterns of demand.

Underlying Causes
Demographic Factors
- Population density
- Rural-urban migration
Economic Factors
- Labour market
- Output & input prices
- Economic incentives
- Urbanisation
Policy & institutional factors
- Land tenure policies
- Agricultural policies
- Market regulations
- Producer organisations
Societal Factors
- Consumption patterns
- Values and beliefs
- Deagrarianisation
Infrastructure/Technological Factors
- Road network
- Agro-technology
- Market infrastructure

Mediating Factors
Farm Factors
- Size
- Tenure type
- Soil quality
- Typograph
- Location
Household Factors
- Demographic composition
- Farming background
- Duration of residence
- Family labor
- Education

Proximate Causes
- Related to intensification
- Related to extensification

Land Use/Cover
- Coffee
- Other cash crops
- Subsistence crops
- Pasture
- Forest crops
- Pasture
- Forest

Fig.1: Conceptual model showing causes of land use change, modified after figure by Bosselmann (2012)
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Bosselmann (2012) conceptualises the interplay between the many processes involved in agricultural land use change, based on the writings of Geist et al. (2006). As shown in Fig.1, there is a large degree on interplay between processes going on at different scales and different systems, meaning that it is both hard and non-productive to try to name a single overarching and definitive causality. Nevertheless, the interconnectedness at work also creates the possibility that one of the factors, in this case certification, can start a process that interplays with the others. Also, it is hard to easily categorise certification within this framework since it is both an “economical” incentive both also tightly associated with societal factors.

As described in chapter 2.1.2., farmer behaviour is central to any reasoning that tries to explain land use. “Household factors” can play an important role in this regard in the context of urbanisation and the low appeal of farming to the younger generation, who prefer to seek higher education or livelihoods away from the countryside. According to Bosselmann (2012), this “deagrarianisation” process would lead to less intensive land use in terms of labour input, for example transformation of farmland into pasture, since so many farms are reliant on family members working the land. Bosselmann (ibid) concludes that larger land use conversions are more likely to occur with farmers who have less access to workforce and/or those who don’t get the majority of their income from coffee but are already growing multiple crops.

With regards to natural conservation, individual opinion and understanding is also important. According to Pagiola et al., (2004) the basic logic for the farmer is economics, while environmental concerns like biodiversity are usually further down the list of concerns. Paying for Ecosystem Services (PES), then becomes a way that "internalizes what had been an externality, ensuring that it is taken into consideration in decision making" (ibid, p.1). Taking the top-bottom approach further, they argue that: "a way is needed to communicate what is desired to potential participants in ways that they can understand. The typical solution has been to offer to pay not for biodiversity itself, but for land uses that are hospitable to biodiversity" (ibid, p. 13).

Although doing a cost-and-benefits-analysis (CAB) can be a good way to make abstract concepts like biodiversity more concrete, it also risks depriving the farmers of any rationale beside economics, neglecting the farmers’ understanding of their own environment and livelihood. This approach also doesn’t appear to measure any direct benefits of changing land use but instead uses arbitrarily defined land as a proxy to compare any changes to. Pagiola et al., (2004) openly acknowledges this dilemma when they describe how the amount of compensation (which in itself assumes and accepts that ecological oriented farming is an economically unproductive affair) is not adjusted to the different landscapes and ecosystem services that are available nor take into account their proximity to other biomes.

2.3 A Place for Nature

Although already touched upon in previous chapters, the relationship between “nature” and agriculture is vitally important, which is why the following section is devoted solely to the dynamics between the two.

2.3.1 Nature Vs Agriculture

One argument that is sometimes brought forward in support of increasing agricultural intensification, particularly one characterised by capital intensive/labour extensive practises is the
Environmental Kuznets Curve (EKC). The underlying assumption behind it is that economic growth will be a catalyst which initially may involve a deteriorating environment due to large resource extraction and pollution. However, the unsustainable practices will peak eventually as growth induced income will spur investments which in turn will lead to better technology, as well as better education and consumptive practices. The stronger economy will also be able to pay more money for natural protection (Lee et al., 2001). When using the EKC or similar concepts or models, a conflict between nature and agriculture/development is often taken for granted, resting on an assumption about the difficulty of harmonising two different ways of "utilising" the same limited space. However, this doesn't need to be the case as more attention and examples show the possibility (and sometimes necessity) of human agricultural practices creating good habitats that favours biodiversity (Caudill, Declerck, & Husband, 2014). For example, "half of Costa Rica’s native forest species of birds, mammals, butterflies, and moths also occur in agricultural areas" (Green, Cornell, Scharlemann, & Balmford, 2005, p. 552).

If a conflict does exist, it requires a closer look into the conception behind both “nature” and “agriculture” respectively so as to pinpoint what exactly is in conflict with what, or as McNeely (2003, p. 405) puts it: “The conflict between the ideal of 'undisturbed nature' and the reality of long-term human occupation of the land (Spencer, 1996; Poffenberger, 1990; Turner, 1990) has lead to the wide recognition that conservation cannot succeed unless it is linked to economic opportunities and investments aimed at the rural communities which might otherwise threaten the viability of protected areas through their activities in pursuit of livelihood”. The interconnections between rural socioeconomic development and natural protection is however more complicated than this quotation might suggest, and the rest of this chapter will explore some of the different perspectives that are to be found in the scientific literature.

2.3.2 ”Land sparing” Vs ”Land sharing”

There are many different ways of handling the potentially negative effects of farmland expanding onto forests and other biodiverse landscapes. The one most people are familiar with are perhaps what Green, Cornell, Scharlemann, & Balmford (2005) call “wildlife friendly farming”; it can include as diverse tactics as the limited use of chemicals or leaving separate areas of undisturbed land left in the fields. According to Green et al., (ibid) however, these tactics come with a trade-off between having larger amounts of biodiversity on their farmland on the one hand, and the decreased yields these methods result in on the other. If the farmer does decide in favour of this wildlife friendly farming, the decreasing yields then means that some sort of compensation method is in order. Either, the farmer is compensated economically for the financial loss, or the farmer compensates spatially in the form of expanding the area of cultivated land. Perfecto & Vandermeer (2010) disagrees with this notion of organic agriculture producing less yields than conventional farming, claiming there is insufficient evidence to support this and that small-holder farmers using organic techniques through mosaic landscapes can produce equally or even more.

The principle of ”land sparing” makes a similar assumption about the difficulties of having a biodiverse farming landscape. Instead of having a situation where two conflicting land uses must share a limited area of space, this approach argues for leaving the practice of farming and conservation on two different areas by intensifying production on existing farmland and thus being able to either avoid expansion or even letting previous land be reforested (Phalan, Onial, Balmford, & Green, 2011). Since empirical data suggests that even under benign conditions, biodiversity is
always lower in farmland than in forests, land sparing is argued by its proponents to be better for conservation purposes. Because of this reasoning, another term for it is ”sustainable intensification”.

Padoch & Sunderland (2013) criticise the land sparing strategy based on its inherent assumptions. Among other things they question the emphasis on higher yields and point to the important role of large waste numbers, distribution and access. They also argue that the economic incentives to expand cultivated land might even increase under this strategy. Providing a contrasting opinion is Phalan et al., (2011, p. 1290) who after a study about bird and tree variations during different land use strategies in India concluded that "land sparing resulted in the highest total population for the majority of species in each taxon, country, and range-size group, at almost all production targets". They do however acknowledge that they did not take into account factors like "ecosystem services, externalities, spatial structure, long-term sustainability of yields" (ibid).

"Land sharing" is the opposite strategy. Rather than being driven by technical solutions like fertilisation/mechanisation, land sharing is about integration of both farmland and nature through a distinct landscape approach with a mosaic of different land-uses (Phalan et al., 2011). This diversification not only acknowledges the different values of the landscape (be they biological, sociological or other) but also its ever changing nature, not being locked in stasis and unaffected by surrounding influence (Padoch & Sunderland, 2013). There is also no goal of intensifying production. Among the potential benefits that can arise from land sharing are the different habitats created for organism, something which in turn helps with delivering different ecosystem services. It can also be an opportunity for a land use strategy in places that, for reasons such as topography or remoteness, are unsuitable/able for conventional high input agriculture (ibid). Land sharing is in many ways close to agroecology that also argues for a more landscape driven approach and a multi-purpose farmland (Scherr & McNeely, 2008).

2.3.3 Natural protection paradigms

Campbell (2002) uses the concept of narratives to explain different paradigms and discourses used to justify natural conservation. In what Campbell calls the "traditional” narrative, there is an inherent dichotomy between nature and people, where nature is viewed as being in a state of constant crisis from exploitation. "Local people are removed and, if they do not respect the conditions of their removal, they are labelled ‘poachers’ and ‘encroachers’. Thus, they reconfirm beliefs about the source of the crisis and, as they are breaking the law, the solution becomes more and better enforcement” (ibid, p. 30). Bray & Velázquez (2009) and Jackson, Pascual, Brussaard, et al. (2007) similarly argue that this approach often leads to conflict more than anything else.

Acting as an antithesis of sorts to this school of thought is the ”counter-narrative”. Instead of defining people as the problem, their involvement and control are deemed instrumental in the success of conservation projects. Through concepts like ”sustainability”, this paradigm justify itself by "the argument that wildlife and biodiversity must be valuable if they are to be conserved, and that value is often derived through utilization” (Campbell, 2002, p. 30), this not being limited only to monetary value. However, behind the often agreed upon idea of sustainability is different kind of usage, or to be more precise, ”consumptive” and ”non-consumptive use”, the difference between them being whether or not anything (be it resource, fauna etcetera) is removed by the act or not.
Campbell (ibid) emphasises that, as may often be the case, the distinction between the two aren’t always clear cut.

In the case of Costa Rica, Nygren (1998) distinguishes between the following discourses pertaining to environmental protection and the different actors using the same concept of "sustainable development” to forward very different ideologies and goals:

- "Environmentalism for Nature”. The classic view of natural protection; human usage of natural resources being the problem and the solution being increased amounts of protected areas on the one hand and education on the other.
- "Environmentalists for Profit”. Using a pragmatic sort of reasoning where nature can only be protected through economic growth, proponents of this perspective are often advocating strategies such as eco-tourism and reforestation, or switching crops to more non-traditional varieties like green vegetables.
- "Alternative Environmentalism”, being marked by a strong opposition to "Western" influences and the damaging agricultural practices transmitted through globalized economic processes.
- "Environmentalism for the People”, opposes large scale solutions and instead favours a very local, subsistence type of agriculture and agroforestry.

Because of the difficulties in achieving the goals of conservation projects without the goodwill of the locals, there has been a merging of what has been traditionally labelled environmental and development projects respectively. The popularity of the more holistic approaches is reflected in the terms for funding projects, which in the last 20 years or so has been increasingly difficult to find without at least some recognition being paid to the interrelatedness of the subjects. However, acknowledgment in the form of writings is one thing, practice is another. Campbell & Vainio-Mattila (2003) are of the opinion that particularly natural conservation agencies, often being rooted in a natural science perspective, have difficulties in applying lessons already learned from participatory development in their conservation projects. Among these they list a failure to appreciate conflicts within local communities, treating them as homogenised units. A lacking socio-economic understanding further leads to incentives that are aimed not so much at long term improving of living conditions but instead “income substitution”, something which is hard to achieve if income is already low. This is especially the case when viewing participation more as a means (local people being involved) rather than an end (empowering local communities and letting them have ownership).

One way of trying to create synergies rather than conflict between socioeconomic needs and natural protection are so called Integrated Conservation and Development Programs (ICDPs). There are a number of challenges that needs to be tackled with these projects however. Wells and Brandon (1992 in McNeely, 2001) claim that ICDPS are, because of their wide scope, high involvement rate of different actors and ambiguous yet ambitious objectives, filled with both managerial problems and no clear consensus regarding their effectiveness. Brandon (2001) criticises two assumptions that are supposedly detrimental to ICDP design.

1) The monetary incentives that are commonly used to promote change; to weigh biodiversity or other subtler environmental values against a calculated monetary number is not easy and can make little sense to the people involved. Upphof (2001, p. 447) is very much of the same mind: "Incomplete quantification gives unjustifiable emphasis to those elements that can be measured."
Also, goods of a more public than private nature, which include many environmental benefits, lose out in evaluations that denominate everything in monetary terms".

2) The implicit promise that by combating poverty and pursuing classic development objectives, the state of the environment will improve. While not questioning that existence of such a relationship, Brandon (2011) argues that the linkages must be made explicit, taking into account factors of scale, the origin of degradation and the dialectic impact that takes place between society and nature (which is never static). One possible way of doing this, according to Upphof (2001) is by working with the locals to promote factors such as soil or water quality, which, if managed correctly, will result in higher biodiversity levels even if this isn’t the locals main interest in biodiversity per se.

A third complicating factor is when an organisation is more interested in one aspect (be it social/environmental) than the other, but has characterised their project as an ICDP for funding reasons. Or perhaps there are genuine good intentions, but the internal competence isn’t always there when a party with a more specialised expertise tries to cover more grounds. Campbell & Vainio-Mattila (2003) describe a reluctance among certain traditional conservationists to engage in participatory projects. What happens then is that the so called community-conservation projects are more about conservationists trying to convince the locals to join them (on unequal terms) than any partnership. To strengthen their argument, they point to the fact that many of these ICDPs are revolving around natural parks, the symbol of the old dichotomy of human versus nature. This leads to a situation where, if interests are to be weighed against each other, conservation will triumph. Lastly, the question of power symmetry can be hard to solve. When moving from a situation when external parties have all the power to a more equal sharing, the will to include the local community in the project can also transform into a situation where a lot of responsibility is placed on local stakeholders, but the financial/technical means aren’t adjusted to this fact.

To summarise this chapter, the different views about the interaction between nature and agriculture and the respective land use strategies that come as a result, can be conceptually visualised as a model with two axes (see Fig.2). The X-axis depicts the intensity with which the land is used (low intensity to left and high to the right). The Y-axis is the degree of mixture between nature and farming (high degree of nature at the top & farming at the bottom). All of these are simplified and there are problems with the definition concerning all of them, but as a basic model this helps distinguish them from one another.

In the upper left corner is Nature Reserve characterised by high nature values and low degrees of land use intensity; basically letting the land “take care of itself”. This view of nature then rests on the traditional conservation narrative (with Campbell's (2002) terminology), or the “Environmentalism for Nature” paradigm of Nygren (1998) where nature is viewed as areas with minimal human influence. The dichotomy levels are thus high in this case.
In the lower left corner is **Wildlife friendly farming**, where the land is used for farming but in such a way as to minimise environmental damage. In other words, even though this appear to be better from a conservationist view, it is ultimately a compromise where the dichotomy is very much present. Since it is accepted that agriculture does infringe on natural values, the goal is to lessen this impact through smaller farm areas and less intensive production. In can be said to exist within the “counter conservation narrative” (Campbell, 2002) in the sense that nature is given monetary value, for example through the use of organic certification. In other words this is close to what Nygren (1998) describes as “Environmentalism for Profit”.

In the upper right area is **Land sharing**, i.e., high natural values (in the form of integrated forests and vegetation other than crops) in the farm area. The key difference to “Wildlife friendly farming” is that nature and farming help one another: through integrated nutrient cycles, different ecosystem services are maintained to help agricultural production while still keeping a healthy environment for microorganisms and bigger animals as well. This strategy is a bit harder to classify within Nygren’s paradigms, but probably is closest to “Environmentalism for People”, since it does focus on local land use and practices like agroforestry.

Finally, in the lower right is **Land sparing**. With a firm conviction that neither farmland nor nature prosper from intermixing, dichotomy levels are again high and it is deemed best for production levels and humans to have high levels of agricultural input in order to save the forests, where biodiversity levels always will be higher than in any other setting. Since the type of environmentalism here is indirect (leaving good quality nature undisturbed) rather than direct (no active environmental measures are undertaken within the farm area) it falls outside of Nygren’s paradigms.

It is worth noting that the purpose of this paper is not to validate nor falsify any of these strategies, but in order to better understand the different land use strategies involved, it can be helpful to have this as a general framework to better understand the assumptions, both scientific, philosophical, political and economic, that lay behind them.

### 2.3.4 Operational/management/schemes

Although what is described in this section is more related to natural protection, the logic and problems described are equally relevant when it comes to certification and land sharing, making it relevant in a comparative sense.

The most common way of tackling environmental protection, at least on the macro level, is through economic means. The most common supporting logic to explain why nature is being compromised is that it is in some fashion not valued enough, be that in market terms or through the eyes of (in the case of this thesis) the farmer. The standard remedy is thus to “internalise” nature’s value into the economy. As Pascual & Perrings (2007) argue, there are three prerequisites that need to be met for this to be done successfully: 1) the ability to demonstrate the usefulness of biodiversity in economic terms, 2) the capturing of that value and 3) a good mechanism for sharing the benefits (and by extension the costs). There are multiple practices that try to achieve this is, though the most common one is PES.
Common traits amongst many of these internalising schemes are that they are national in scope, dependent on large scale investment (through institutions like the World Bank), tend to require extensive monitor mechanisms and make strict demands for the recipients to get the economic reward for what is deemed the desired behaviour. This has potential to leave out small to medium scale farmers (Bacon, Olson, Morris, & Shattuck, 2010). Pagiola et al., (2004) acknowledges that in the long term, a conservation method based on continuous payment has problems, for example the ability to secure progress in the event of project termination, though perhaps the most important one is more fundamental: cost-effectiveness. By the internal logic of linking payments to biodiversity levels through a points system, the more successful projects will end up costing more, thus being the opposite of cost effective.

Moreover, the whole basis of how economic incentives can work in changing the practices and actions of poor people with regards to the environment is open for debate. Uphof (2001) stresses how people often are well aware of the deterioration of their local environment and that willingness to protect/improve it does not require guidance by outside actors. If such a commitment is not there beforehand, the question then follows what impact such exogenous assistance has in creating it. If no commitment exists, paying to protect risks being "compensation, reward or bribe for local people not having access to the protected area" (Uphof 2001, p. 441), buying complacency which will only last as long as such rewards continue. Adding to the problem of effectiveness is the challenge of geography, or to be more precise scale. Eventually, these top-down and generic measures must filter down in their implementation to actual local conditions, which might present unique challenges. This is because, as McNeely (2001) argues, the end-of-pipe-like solutions that tend to arise from localisation can be underwhelming if one considers how most of the "threats" to conservation often have their origins at another locale and must thus be addressed elsewhere. In practical terms, this means looking into national policy measures rather than going for protection status of individual local areas.

Lastly, the potential multitude of actors involved in these grander schemes makes it hard to have a clear understanding of what is being done where by whom. On the one hand, Pender et al. (2001) are of the opinion that local organisational incentives decrease as a result by external help, be that from the state or some INGO. This reasoning relies on the widespread notion that local people are the ones who have more intimate knowledge about their own environment and consequently are better at formulating and implementing solutions. On the other hand, McNeely (2001) points to a number of factors that "counters/balances" the issue. First, it's not certain a priori that local people by default are the most likely to make what he calls "wise decisions" for the environment. Second, there can be conflict (for example between different local societies) that make conservation management on this level complicated.

One strategy to make agricultural conservation schemes more successful and also less conflict ridden is to resist the habit of focusing on strict economic incentives, especially in the form of pure monetary compensation, and instead focus on more pragmatic tactics that affect the farmers’ livelihood at a larger timeframe, like technological assets (McNeely, 2001). Brandon (2001, p. 424) voices similar concerns: "The poverty-mitigation approach assumes that poor households have a fixed income need, and, if projects can provide an intervention to help households meet this need, destructive practices will end. Yet the poor typically want to do better economically. Rational
behaviour for them means continuing illegal activities in the absence of strong deterrents or the presence of a risk they perceive as too great”.

Brandon (ibid) continues his criticism of modern conservation tactics by taking slightly controversial stance, claiming that one common reason for their failure is this dual focus on development. While acknowledging the interrelationship between land use practices and environmental degradation (citing the real causes of the problem as often being related to unjust patterns of land ownership), Brandon's logic is that since the source of degradation is often not related to activities or processes taking place within natural parks, the solution can’t be primarily about creating development in these areas. Instead, their main objective of national parks should be natural conservation. Linking back to argument of the need for intensification, Brandon's conclusion is that intensification must occur in order to stop the encroachment of forest, but adds how such measures must be tied to poverty alleviating measures to have any real effect.

3. Methodology
There are always important ethical dimensions when Westerners conduct research in a low-income country. As a foreigner, I have therefore been careful in informing the participants before the interviewing began that: 1) they are not forced to contribute to the research, 2) the purpose of it, 3) how the data will be used, 4) by whom it will be read, 5) that they are allowed to see the results, 6) that they have the right to withdraw information and, 7) their right to be anonymous (Scheyvens, Nowak and Schevens, 2003).

Since my knowledge in Spanish at the time of the field work was not enough for communication of the more academic kind needed for this theses I employed an interpreter in the form of a local farmer who spoke English fluently after several years of working in the US. This was done minimise misunderstanding for both the participants and myself. With their permission I also recorded the interviews to listen to later and try and control that my initial notes were correct. While this is not any guarantee that I have not misinterpreted any answers, I am fairly confident that they are relatively few, and in these cases I take full responsibility for any of them.

Apart from some preliminary enquiries made about the possibilities to contact participants beforehand, the vast majority of contacts had to be made in the field. I solved this issue by using the fact that it was harvesting season to stand and wait by the local coffee collection depot. There, I had my interpreter ask farmers as they arrived whether or not they would be willing to participate in the study. In this fashion, nine randomised farmers Santa Elena farmers were chosen, and three more would be added to that number later on by associated contacts. Contacts with other participants were made later on as my understanding of the locally engaged actors grew and more enquires were made as to their availability.

3.1 Participatory Mapping
Participatory mapping was used as the primary method to collect data for the first research question of this paper: ”What kind of agricultural land-use models are the coffee farmers using?”. One reason for this is that it saves time since the farmers are well acquainted with their own land, but it also allows them to show their understanding of and relationship to the both the cultivated and surrounding areas. Following the principles of participatory mapping based on Narayanasamy
Cultivating Nature

(2009), I provided the participants with general guidelines of what I had in mind (an overview over crop distribution, landmarks, potential zones subject to specific inputs etc.) but they were the ones responsible for the actual mapping process and final product. There are many potential kinds of maps that can be developed through the participator approach, however the focus for this thesis was what is called “resource mapping” of physical features like crop distribution, landscape elements and potentially management practices.

It was my wish beforehand to, if possible take a quick walk around the farmland together with the farmer and do some non-formal interviewing in the process about basic features of the land, but it was not always feasible; sometimes the land was quite small and homogenous so it was no real need to see it all, sometimes the farmers didn’t have a lot of time to spare since it was picking seasons, etcetera. After the mapping was done, a semi-structured interview followed that began by letting the participants explain and reason over the map. The interview covered three broad topics: land use (crop choice, land sharing/sparing, organic vs conventional) the coffee trade (conditions for producing, changes) and relationship to nature.

It is important to point out that although I wished to interview households, it unfortunately came to be that only men were interviewed. The reason for this was that the opportunity to interview the farmers was on the field and not at home, as I had imagined. There is thus a strong gender bias and it would have been interesting and very valuable if wives, daughters or other family members had been given the opportunity to participate in mapping and interviewing.

3.2 Global Value Chains (GVCs)

To answer the second research question of this paper “To what extent does Fairtrade influence the farmers’ choice of these?”, a Global Value Chain (GVC) approach was chosen since it is often used to analyse agricultural trade like coffee trade, meaning there is extensive literature on the subject. At each “link” of this chain, an economic (and sometimes symbolic) value is added (Henderson, Dicken, Hess, Coe, & Yeung, 2002). The fact that the GVC links place and transfer concepts in this manner means that GVCs can be one of the drivers of land use change (Rueda & Lambin, 2013). This kind of reasoning also leads to a necessary addition of an international scale to be added to standard explanations land-use decision making, which often focus on driving forces from domestic or local markets. With regards to the symbolic aspects of the chain, it important to note that is not per definition a one-way flow but that it can be a dialectic process which works at both ends. The value chain is thus both the facilitator and catalyst for change as the creator of said change, making it somewhat difficult to discern a starting point for the data collected.

For the purpose of this thesis, the GVC is a useful model since it is easy to operationalise since it follows six easy-to-follow links: 1) the farm, 2) the purchasing point, 3) milling, transporting and exporting, 4) importing and roasting, 5) distribution and 6) pricing (Rueda & Lambin, 2013). In the case of coffee (though it can be equally true for other crops), it is important to note that power is not shared equally across the value chain, with roasters and importers typically occupying the top of the hierarchy and the coffee farmer at the bottom (Kilian et al., 2006). One reason, among many, for this is the recent decades of increased global production which has resulted in an increased competition among farmers to sell at low price in order to find a buyer at all. At the same time coffee distributors simultaneously keeping the retail price high through branding tactics (D’haeze et al., 2005), regardless of the price they pay to the farmers.
Because of the limited scope of this paper, it was not possible to follow the coffee all the way through to the consumer since it would have to involve going to the USA or European countries like Belgium, the major importers of Costa Rican coffee. However, since all of the three cooperatives studied have their own processing plants, I was able to visit and study step 1-3 and then interview cooperative representatives (as well as the farmers) about the latter stages. In order to track the economic values as they are transported along the chain, quantitative data in the form of statistics (such as the economic progress of the farmers and the producers at the different links of the chain, the costs involved etcetera) has been gathered when possible (see chapter 5 for more details). When possible, statistics about the economic progress of the cooperatives and have also been gathered and analysed.

4. Previous research

4.1 Coffee
4.1.1 As a crop
There are many different types of coffee bean, but two varieties dominate the world market, the comparatively lower quality Robusta bean, mostly used for freeze-dried and instant coffee, and the higher quality Arabica bean used to make the varieties sold at coffee shops, like espresso and cappuccino (Rueda & Lambin, 2013). There are similarly two broad ways of cultivation: "sun grown" and "shaded", where the latter is often recognised as being the more environmentally friendly; Costa Rica at present has a majority of farmers engaged in the shaded variety (Hergoualc’h et al., 2012 in Caudill et al. 2014).

Coffee is a crop that differs from a lot of other agricultural products in a number of key areas. First, being a “cash” and not a “food” crop, one fundamental difference for coffee farmers is that they cannot use it for subsistence farming, but instead use the income generated by its’ sales to purchase food as well as societal services (Bacon, Ernesto, Gómez, Stuart, & Flores, 2008). Second, coffee requires specific climatic conditions and weather with suitable growing conditions for at least 270 days in order to grow (D’haeze et al., 2005), alongside high topography, which directly relates to the quality of the coffee bean.

There are a number of factors which the coffee farmer must find a way to deal with: "Farmers are faced with difficult management decisions and must find a balance between controlling fungal diseases and coffee pests, managing trees and vegetation within the farms, while improving their crop yield and productivity to maintain viable income" (Caudill et al., 2014, p. 86). Adding to this is the temporal dimension. Because it can take up to five years from planting the seed to start of coffee bean production, the decision to engage in coffee cultivation requires a certain level of planning (D’haeze et al., 2005). The investment in coffee is thus an investment in time, which has traditionally made farmers stick with their crops even in the face of economic fluctuation (Samper, 2010).

The uncertainty of trade plus the limited power to affect its associated conditions make the socio-economic environment for coffee growers hard (Sick, 2008). Taken at large, the declining terms of trade for coffee contributes to the poverty that characterises the living conditions of many Latin
American coffee (Bacon et al., 2008), forcing some farmer into “loan and debt cycle[s]” (Lyngbaek et al., 2001). The negatives aside, there also advantages to be found in coffee growing, including relatively high potential value, as well as a product which is relative easy to produce and to store (Sick, 2008).

4.1.2 As a traded commodity
On a global scale, coffee employs millions of farmers and ranks as one of the world’s most internationally traded commodities (Sick, 2008). Like other globally traded goods, the last twenty years of increased dominance of the liberal paradigm has changed the way coffee is traded. 1963 saw the birth of both the International Coffee Agreement (ICA) and the International Coffee Organisation (ICO) (ICO, 2015a) and combined, these two regulated the market. However, after negotiation between buyers and producers failed in 1989, ICA was disbanded in favour of a free trade quotas. This lead to extensive fluctuations in pricing as well an increased amount of coffee being produced, leading to price drops and thus increased hardships for farmers (Rueda & Lambin, 2013; Sick, 2008; Wollni & Zeller, 2006). While prices paid to farmers range from high to low, at the consumer end of the value chain the prices tend to be high regardless of market developments (Samper, 2010).

During the end of the 1990’s, fluctuating prices for coffee on the world market together with an increased competition from South East Asian competitors hit especially small-scale Latin American farmers hard (Kilian et al., 2006). The reaction among many farmers varied. Some chose to switch from coffee to cattle farming, leading to a large negative impact on biodiversity levels since it often meant cutting down forest to make room for new pastures (Bacon et al., 2008), while others chose to start growing other crops like pineapple. A third option was for the household to become less reliant on farming all together and start mixing their income with wage labour (Sick, 2008). More or a relevance for this paper, some farmers chose to start catering to niche markets by trying to apply for different types of certifications, cut down on chemical costs or start interplanting coffee with other crops to diversify income (Samper, 2010).

Bacon et al., (2010) have studied coffee cooperatives in El Salvador and Nicaragua and make a point that the deregulation of the coffee market in the 1990’s helped the transition to more sustainable agriculture. This is because many state programs were operating under Western ideals about large scale operations, high degrees of industrialisation and capital intensive techniques. When these were disbanded, many farmers instead started to organise themselves, often leading to more ecologically oriented methods. This happened in Costa Rica as well (see chapter 5). From an ecological perspective however, Bacon et al. (ibid) found that ”Individually managed small farms contained higher levels of shade tree agrobiodiversity in coffee plantations than collectively managed cooperatives” (p. 369), the reason being a larger crop diversity in the former whereas the latter tended to focus on just one, coffee.

4.1.3 As a vehicle for environmental and social change
Since coffee is grown in tropical regions of the world with high levels of biodiverse nature and a lot of poor smallholder farmers, coffee lent itself to criticism for the negative impact traditionally had in terms of environmental degradation and exploitation. As a result, coffee was one of the earliest agricultural products to become involved in “sustainable certification” (Naturskyddsföreningen, 2015; Potts et al., 2014). The starting point for this development was the Dutch Max Havelaar label
in 1988, building on the idea that the customer, through buying certified goods, can contribute to the economic and social standards of the people responsible for producing it, with guarantees about minimum wages and the like. After sending ripple effects around for similar initiatives elsewhere, the Fairtrade Labelling Organizations (FLO) was founded in 1997. The Fairtrade organisation has grown to include a variety of goods, but among these coffee possess a special place, According to their 2015 annual report, 54% of all the FT farmers were growing coffee, 34% of it being classified by them as organic (FLO, 2016a).

There has been research into the correlation between different land-use strategies and environmental impact, mostly comparing sun-shaded coffee to sun coffee. According to a study by Caudill, Declerck, & Husband (2014) in Costa Rica, there was a distinct level of difference in species abundance of mammals in areas of shaded coffee (though the quantity was still lower than similar levels of a given forest). More importantly was their conclusion that "increasing intensive coffee production has landscape scale effects, decreasing small mammal richness and abundance within the extent of this production type regardless of scale" (ibid, 2014, p. 92). This analysis is shared by Bacon et al. (2008) who found greater biodiversity levels on small-scale coffee farms. This can be put in contrast with higher soil degradation, pollution and vulnerability to price fluctuations often found on conventional farms (Lyngbaek et al., 2001). Another similar study by Adams & Ghaly (2007) had similar results: biodiversity levels in traditional coffee plantations in Costa Rica, that more mimicked an agroecological land-use, were generally higher and worked in a more synergetic manner. A protective cover of leaves from crops and trees provides nutrition to the soil but also reduce evaporation.

In general, there can be striking potential differences between different farming systems. To sum it up with previous writings on land use, there are two “opposites” to be found:

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4.2 Fairtrade

Goodman (2004) analyses the role that Fairtrade has played both with regards to how it affects the identities of producers and consumers alike, but also how the linkages between how places are formed and maintained, making it highly relevant to purpose of this paper. According to Goodman, there is a dynamic at work within FT where the capitalist system is simultaneously opposed (in the sense of trying to alter some of its negative outcomes, such as low wages) and used as a means to empower farmers by creating a what he calls a ”moral economy”. There is both a material and a discursive dimension to this, where the labelled products "while involved in connecting the places of consumption and production, also makes place through morally-tinged markets, premiums, and
standards” (Goodman, 2004, p. 896). Because of the many aspects and broad goals/intention of Fairtrade, it does not let itself be easily classified as just one thing, instead being a form of trade, a social movement and a vision (Paul 2005 in Sick, 2008).

Overall, aspects like the right for the workers to organise, wage levels, and minimum prices are what characterises FT, however environment is listed as one of their four “common principles” and includes “minimized and safe use of agrochemicals, proper and safe management of waste, maintenance of soil fertility and water resources and no use of genetically modified organisms. Fairtrade standards do not require organic certification as part of its requirements. However, organic production is promoted and is rewarded by higher Fairtrade Minimum Prices for organically grown products.” (FLO, 2016b). This makes it relevant to study to what extent these principles have any impacts on land use, since other certification standards like Rainforest Alliance are more explicit in this regard, with goals “to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices and consumer behaviour” (Rainforest Alliance, 2016).

4.2.1 Advantages for the Farmer
Sick (2008, p. 204) summarises the farmers’ decision making process regarding FT and lists a number of conditions that play a role in whether or not to apply for certification: These include local ecological conditions that affect coffee quality (e.g., soils, altitudes), infrastructure and distance from markets, available economic alternatives, and the size of producer cooperatives. Consequently, farmers evaluate production for FT just as they have always evaluated production for the conventional market: in terms of the perceived costs, risks, and benefits stemming from both global and local factors.”

Breaking it down in more detail, the most immediate advantage of FT is that it guarantees a minimum payment to farmers during periods of low international pricing, and a premium should prices rise above this minimum. In addition, even though not all goods licensed by FT is organically grown, there is extra money to be had for farmers choosing to engage in it (Kilian et al., 2006). Also, since the whole supply chains needs to be audited and the buyer of the certified product must also have a licence to sell (FLO, 2011), it encourages farmers to join together and that many producers are larger cooperatives (Sick, 2008). Given the nature of the value chain and the cooperative being the chief party engaged with FT, means that most of the potential advantages of membership is directed at this scale and must then “filter down” to individual farmer household. This means that the capacity building is a key issue for the success any FT sponsored programmes (Dankers, 2003; Raynolds, Murray, & Taylor, 2004).

To summarise, these are the more long term advantages most often cited in previous research (Bacon et al., 2008; Dankers, 2003; Kilian et al., 2006; Sick, 2008):

• Access to credit
• Economies of scale
• Guaranteed market
• Long-term relationship with buyers and importers
• Access to and better integration in markets and trade networks, with long term contracts between producers and buyers which can help with planning.
• Technical assistance
• Emergency food in times of crisis
• Education opportunities
• Engagement in a variety of different development programmes, including soil, water and other environmental schemes

Depending on the nature of the value chain for the producer in question, there are also further potential advantages of certification for those farmers who can process their own coffee in keeping middlemen down and getting a larger share of price premiums, compared to those who use centralised plants to ship/distribute the coffee (Lyngbaek et al., 2001).

4.2.2 Drawbacks for the Farmer

Just as there are advantages for being engages in an officially Fairtrade certified cooperative, there are potential drawbacks. To start with, the amount of produce actually sold to (and further licensed) by FT can be a relative small amount of the actual coffee grown by a household (Bacon et al., 2008). Even though there is evidence to support that FT farmers do get paid more than non-certified farmers for their produce, the difference can be quite small. This limit in economic profit can be as true for salary levels of hired labour, although it must be emphasised that the sum used to calculate this is often based on averages and can thus vary from case to case (Bacon et al., 2008; Sick, 2008). There is also the question of market demands, where FT is known to have an issue with oversupply in relation to demand, which becomes important since the extra FT premium price is not provided if the coffee is not sold to the customer as such (Dankers, 2003; Sick, 2008).

Additionally, there are costs associated with membership in FT. First, there are monitoring fees associated with inspections to guarantee that FT standards are being upheld: "Some farmers complained that, once these costs were deducted, FT guaranteed minimum prices were not much better than conventional market prices. In addition, there are the transaction costs related to monitoring farmers' fields" (Sick 2008, p. 200). Both the application process and associated audit needed to become certified by FT, as well as future monitoring, are not conducted by FT directly since 2003 have been done by “an independently governed subsidiary of FLO”, called FLOCERT (FLOCERT, 2016). They describe themselves as “as a 'social business' – not focussed on making profits, but aiming at covering our cost and providing the resources needed to continuously improve the services and systems for the benefit of our customers” (ibid). Second, since the profit the farmers get from FT isn’t related to quality, the minimum payment doesn’t always translate to the “best” price available, meaning that it can be economically better off for a farmer to save his/her best quality produce for a private buyer. Third, for those farmers wanting to grow organically, the production costs are higher including "additional labor, processing, and certification [plus opportunity costs related to how] yields are lower than for conventionally produced coffee" (ibid). In the end, Kilian et al., (2006) argue that the virtues FT and its economic advantages for farmers is often taken at face value, with relatively small amounts of empirical data to back it up.

As a form of intermediary between consumer and producer, with an explicit goal to change both of these groups there is also the issue of who FT and other certification organisations represent and what kind of accountability can be demanded from them. The fact that they are commercial companies that could have potentially conflicting points of interest when it comes to aspects like the costs for membership and inspections. Another question is whether or not the standards that they
advocate are to be considered the method/road or the goal itself. Last but not least, the availability of a local certification body and inspectors in more remote locations could act as a potential barrier that can exclude the most marginal farmers due to either lack of local contact or higher costs associated with travel expenses (Dankers, 2003).

On a similar note, since the cooperative occupies such an important position as the primary target for FT benefits, issues of democratic accountability and functioning also become vital. This is not only true in terms of scale but also given the fact that often the farmer members have less language skills and/or market knowledge, resulting in a big responsibility for the management to represent and aid the people at the bottom of the value chain (Raynolds et al., 2004). Since some cooperative farmers who might not be directly certified and thus have no direct contact with FT, there is sometimes a lack of knowledge about FT further down the value chain (Ronch, 2002).

4.3 Case study: Costa Rica

Costa Rica stands out from the surrounding Central American countries (Campbell, 2002). If compared with neighbouring Nicaragua for example it distinguishes itself in many key development areas such as literacy levels, infant mortality, GNP per capita etcetera. In comparison to countries like Guatemala, which still suffers the social aftermath of its 30 year long civil war, Costa Rica has enjoyed peace and democracy since 1948, after which it constitutionally abolished its military (Landguiden, 2016). Being a relatively small country population with around 5 million inhabitants, and limited options in terms of its domestic purchasing power, Costa Rica early on turned to international export for its GNP needs; agricultural products, among them coffee, being on the most important sources of revenue (Sick, 2008).

Characterising Costa Rican policy during many decades around the middle of the 1900s was a welfare oriented state with a number of programmes in place to promote education, healthcare etc., funded by taxes for the wealthiest and a nationalisation of its banks (Campbell, 2002; Landguiden, 2016). "In Costa Rica, democratic processes, though not perfect, are deeply embedded in all levels of governance, and the state has been instrumental in providing widespread access to health, education, clean water, and other social benefits frequently lacking in many coffee-producing communities in Latin America" (Sick, 2008, p. 205). However, during the 1980s and the big economic recession that affected a number of Latin American countries, Structural Adjustment Programmes (SAPs) was enforced by the International Monetary Fund (IMF) and the World Bank after the economy went down; government subsidies ceased and instead gave way to privatisation and liberalisation (Daniels et al., 2010). In their wake, wages dropped and unemployment levels rose (Campbell, 2002).

These developments did not occur in isolation but were among others that began decades earlier in a radical transformation of the structure of the Costa Rican economy, where agriculture's share of GDP has fallen from 30% in 1960 to 5% in 2013 (see Fig. 3); the same type of downward trend can be observed for the number of people employed within the agricultural sector. Meanwhile, service jobs have become increasingly important for both money generation and employment (see Fig.4) (World Bank, 2013a). This trend has continued up to this day to an extent that "development and urbanization are now key drivers of land use change in some parts of Costa Rica" (Daniels et al., 2010, p. 2124).
This trend has continued up to this day to an extent that "development and urbanisation are now key drivers of land use change in some parts of Costa Rica" (Daniels et al., 2010, p. 2124). The urbanisation during the same period has been equally dramatic, more than doubling the amount of people living in the cities from 34% to 75% of the population (see Fig. 4) (World Bank, 2013b).

That being said, agriculture stills play an important part for many people's livelihood, especially with regards to coffee, a crop which engages around 80 000 farmers (ICAFE 2007 in Sick, 2008). As the agricultures part of GDP has fallen, the economic situation for coffee farmers has been increasingly hard, especially since the market was deregulated in the 1990's. Many farmers have
switched from coffee to pastoralism, not only in Costa Rica but all over Latin America (Pagiola et al., 2004).

4.4 Coffee

4.4.1 Historical overview

Historically, Costa Rica has never been one of the world’s major coffee exporters, falling far behind the dominance of Latin America’s largest exporter Brazil. During the last century, Costa Rica’s coffee trade has gone through many cycles of stability and recurring crises that were often brought about by a combination of oversupply and low prices, leading to many farmers becoming indebted and forced to sell their land. In turn, land ownership has been consolidated into the hands of large landowners, many of which were foreign or represented foreign interest. In the early 1900s, the coffee price started out low but the situation improved in the 1920s because of “green revolution” farming methods. The second world war virtually closed down the European market and prices went down again and continued to fluctuate until the International Coffee Agreement of 1971 (Samper, 2010). Costa Rica, like many other coffee producing countries was hit hard by the international coffee crisis in 2001, leading to substantial losses before stabilising again a couple of years later. In the meantime, the continuous downward trend in coffee production has continued and virtually halved between the 1992 and 2015 (International Coffee Organization [ICO], 2015b), while prices for fertilisers has continued upward (see Fig.5).

Meanwhile, an increasing amount of cooperatives were formed and took control over at least part of their own value chains, though the oligopoly of a few foreign firms dominating the processing business has to a large extent remained. As the green revolution came about, fertiliser amounts were increased and land use intensified as well as expanded in lower altitude areas like Pérez Zeledón. Leading up to the disbandment of the international coffee agreement at the end of the 20th century, this intensification lead to a doubling of Costa Rica’s coffee production. Price speculation, increased competition from newer coffee producing countries like Vietnam and more saturated demand in the West has been the new norm since then. Meanwhile, the world market has seen a larger differentiation between the more gourmand use of cheaper low quality robusta coffee on the one hand and the gourmet demand for high quality, “sustainable” coffee on the other (Samper, 2010).
With regards to land-use change, coffee occupies a special position. On the one hand, the market fluctuations and the ever increased cost for chemical inputs are factors that has encouraged some farmers to switch crops or look for other sources of off-farm income (Samper, 2010). On the other hand, the time it takes from initial planting of the coffee plant to the first harvest creates high conversion costs for the farmer and makes it less attractive to make big changes in land use, creating a high degree of path dependency and making many committed to coffee (Bosselmann, 2012).

### 4.4.2 Modern state of the trade

Today, coffee occupies an interesting position in the Costa Rican export statistics. Focusing on number of tonnes, coffee does not even rank among the top 10 agricultural export products but occupies the #11, way behind bananas (#1) and pineapple (#2); from an export value perspective however, it comes in at #3. Taken together in $/unit, coffee suddenly becomes the most important agricultural in Costa Rica, 13 times more profitable than bananas and 11 times more profitable than pineapples (see Fig. 6) (FAOSTAT, 2012). The global competition is fierce however and Brazil is 12 ranks above Costa Rica (FAO, 2015).

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Quantity (tonnes)</th>
<th>Value (1000 $)</th>
<th>Unit value ($)</th>
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<tbody>
<tr>
<td>1</td>
<td>Bananas</td>
<td>Bananas</td>
<td>Coffee, green</td>
</tr>
<tr>
<td>2</td>
<td>Pineapples</td>
<td>Pineapples</td>
<td>Food Prep Nes</td>
</tr>
<tr>
<td>3</td>
<td>Palm Oil</td>
<td>Coffee, green</td>
<td>Meat-CattleBoneess (Beef&amp;veal)</td>
</tr>
<tr>
<td>4</td>
<td>Other melons (inc. cantaloupes)</td>
<td>Food Prep Nes</td>
<td>Milk Whole Dried</td>
</tr>
<tr>
<td>5</td>
<td>Fruit Prp Nes</td>
<td>Palm Oil</td>
<td>Palm kernel oil</td>
</tr>
<tr>
<td>6</td>
<td>Sugar Raw Centrifugal</td>
<td>Fruit Prep Nes</td>
<td>Pastry</td>
</tr>
<tr>
<td>7</td>
<td>Food Prep Nes</td>
<td>Sugar Raw Centrifugal</td>
<td>Palm Oil</td>
</tr>
<tr>
<td>8</td>
<td>Beverage Non-Alc</td>
<td>Pineapple Juice Conc</td>
<td>Pineapple Juice Conc</td>
</tr>
<tr>
<td>9</td>
<td>Cassava Dried</td>
<td>Other melons (inc. cantaloupes)</td>
<td>Fruit Prep Nes</td>
</tr>
<tr>
<td>10</td>
<td>Pineapple Juice Conc</td>
<td>Cassava Dried</td>
<td>Oilseeds, Nes</td>
</tr>
</tbody>
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*Fig. 6: Costa Rica’s top agricultural export commodities. Source: FAO (2012)*

Around 40% of the coffee farmers in Costa Rica are organised in some sort of cooperative (Wollni & Zeller, 2006). For the remainder, ICAFE (Instituto del Café del Costa Rica), founded as a direct consequence of a law passed in 1933 to help regulate the national coffee trade, is the major counterpart (ICAFE, 2016). The institute operates by a principle of giving farmers an advanced payment for their product when sold, while the remainder of the money is given in November.
(about a year after harvest), based on current market price (Adams & Ghaly, 2007; Wollni & Zeller, 2006). Since ICAFE has such a strict regulatory role in setting the price, there is no real reward or benefit for those farmers who produce more sustainably or organically – the price is the same regardless in order to guarantee a fair price (Adams & Ghaly, 2007).

From a market and value chain perspective, there is an oligopoly in the Costa Rican coffee trade: “12 exporting companies account for 95% of the total exports …[where] multinational conglomerates control 30% (...) The main goal is to sell quantity, not quality, and as a result Costa Rican coffee is a somewhat generic product. This phenomenon has put the country at a disadvantage, as these large players are not necessarily interested in promoting environmentally sustainable coffee in Costa Rica. Producers do not have the opportunity to promote sustainably grown coffee because it is blended with coffee from other producers and becomes indistinct” (Adams & Ghaly 2007, p.1727).

From a FT perspective, just as is the case with production of coffee in general, Costa Rica is neither at the top nor bottom. On a comparative level, Costa Rica stands for about 6% of the total annual FT production 2014, however with their 32 200 metric tonnes of coffee they rank as the 5th top producer, with Colombia being the top with around 30%. Breaking down those numbers reveal 24 200 Costa Rican FT farmers in 8 “producer organisations”, though definition of what entails is not clear (FLO, 2016a).

**4.4.3 Coffee and land use**

In a trend that goes in the opposite direction of Costa Rica’s modern self-image as a country characterised by natural protection areas, the coffee plantations have undergone a transformation from traditionally shaded, multi-crop farms to high chemical input farms in search for ever increased productivity numbers: “The Costa Rican coffee industry’s production methodology has been transformed from multi-strata, biologically diverse system to a monoculture system devoid of 90% of the flora and fauna found in a traditional system (...) At present, it is estimated that more than 90% of land planted with coffee is cultivated as a mono-crop” (Adams & Ghaly 2007, p. 1721). This has led to deforestation in the past and losses of biodiversity, increased soil erosion, sedimentation rates and reports of health problems related to pesticides. There is also a risk of exploitation of coffee workers and pickers as salary levels are kept low to compensate for low sales. Views differ concerning the Costa Rican government role in this land use change, some researchers claiming that it, at least in the past, has played an active role in promoting intensified land-use as the primary way increase income for the farmers (ibid). At the same time, Babin (2014, p. 124) argue that the Costa Rican government has had a “pivotal role ... in a successful agroecological transition that reduced external inputs costs” through the program Caficultura Sostenible en Pequenas Fincas (Sustainable Coffee Production in Small Farms), which “provided structure, leadership, training and resources” (ibid, p. 106).

The percentage of organic land that is classified as being under organic management in Costa Rica is ca 2%, making them the highest ranking country in the world (Dankers, 2003). In a comparative study from 2001 between organic and conventional smallholder coffee farms in Costa Rica, Lyngbaek et al., (2001) found that production numbers were generally lower on organic farms, on average 22% lower per hectare and 17% lower per plant, though there were exceptions to this trend. The reason behind the lower production rate is argued to be an amalgamation of different factors,
for example higher competition for nutrients, water and light between coffee and other vegetation (including trees within the farmland), coupled with the fact that many organic farms had lower amounts of coffee plants compared to conventional ones. For the conventional farmers however, there is the issues of high cost for agrochemicals, which can make up a substantial part of the farmer expenses. There is also the question of nutrient depletion of the soil, acidification (Castro-Tanzi, Dietsch, Urena, Vindas, & Chandler, 2012). This type of intensive land use also risks soil erosion that can lower yields in the long run (Montgomery, 2007). In the Tarrazú region, Castro-Tanzi et al. (2012) found that the common use of synthetic fertilisers had led to depletion of minerals like calcium in the soil as and warned of the possibilities of the so called coffee rust fungus developing higher resilience due to continuous pesticide use.

Although the number of farmers who practice organic and/or agroecological land use practices are limited, there are still a number of “sustainability” programs or methods in place on a national scale. These can come both from certification organisations and the government and tend to focus on different aspects, though more often than not these models tend to lack concrete ways to promote crop diversification. From a sustainability point of view, particularly with regards to biomass, there are huge potential wastes connected to the coffee processing plants, since the bean (the only part of the coffee cherry which has any significant economic value) only makes up 18% of the total weight. Leftovers, ranging from the pulp to the mucilage can potentially be used as fertilisers though the arrival of the coffee borer beetle has played some part in reducing this practice since there is risk of spreading the parasite due to its ability to survive this process (Adams & Ghaly, 2007).

Dankers (2003, p. 94) conclude that “organic methods may improve traditional farming systems and increase yields. However, whether it is worth going through a certification process depends greatly on the market for certified organic products, and whether price premiums compensate for certification costs. For farming systems that make intensive use of external inputs, adopting organic practices may, initially, reduce yields. Effects on cost of production depend a lot on individual circumstances, such as local wages for unskilled labour. Certification may be essential to obtain a premium to compensate for lower yields.”

### 4.4.4 Natural conservation practice

There are many actors involved in the sustainability discourse in Costa Rica, all using it to forward very different agendas. Carriere (1991 in Campbell, 2002) describes three so called "nexuses":

- **The capital accumulation** nexus – being the most influential and powerful since it includes both major political parties as well as the private sector. Environment is not a priority in itself as much as a potential economic loss in cases of severe degradation.

- **The social reform** nexus – encompasses traditional left oriented parties and movements. Similar to the capital accumulation nexus, sustainability is viewed primarily in an economic manner, where equity measures, crop diversification and resistance to SAPs is the focus.

- **The eco-development** nexus - made up of environmental groups and governmental departments responsible for conservation and often split between those favouring more progressive and conservative political solutions respectively.

These different nexus all have different actors associated with them, with the Ministry of Natural Resources, Energy and Mining (MIRENEM) being part of the "eco-development", and the Ministry of Agriculture and Cattle Husbandry (MAG) part of the "capital accumulation" (Nygren, 1998).
During the second half of the 20th century, the deforestation rate in Costa Rica was one of the fastest in the world (Daniels et al., 2010) with a maximum average of about 7% per year, effectively resulting in a halving of the nation's forest cover in just over a decade (Bilsborrow & Carr 2001).

![Land use change, Costa Rica (1979-1992)](image1)

*Fig. 7: Land use change in Costa Rica on a national scale 1979-1992. Source, de Camino et al (2000, p. 29-30)*

![Land use change, the San José region (1979-1992)](image2)

*Fig. 8: Land use change in the San José region 1979-1992. Source: de Camino et al. (2000, p. 29-30)*
In the case of Costa Rica it is worth noting that, apart from forestry, it was primarily extensive cattle-farming and not conventional cultivation that was the major source of deforestation, one reason being the national subsidies and regulations supporting livestock (Pagiola et al., 2004). “The main change in Costa Rican land use since 1950 has been the transformation of forests into pastures and farmland. The predominant vision of development and economic growth was linked with agro-export production, which supported the expansion of agriculture and cattle ranching. In the 1980s, however, Structural Adjustment Programs (SAPs) introduced by the World Bank reduced the profitability of agriculture and cattle ranching in marginal forest lands. SAPs, along with Costa Rican policies that created special conservation areas and promoted reforestation and forest management, have significantly reduced rates of deforestation” (de Camino, Segura, Arias, & Pérez, 2000, p. xviii).

With regards to land use, there are some clear trends visible in terms of transformation between different categories. On a national level, between the years 1972-92, the majority of change that occurred was forests of different types being turned into pasture (68%) or crops (5%) (see Fig. 7). On a regional scale however things were different, with a more pastures reverting to forest (see Fig 8).

The forestry law of 1966 not only came to play a vital part in stopping deforestation, but it was also a key instrument for the creation of national parks (Campbell, 2002; Daniels et al., 2010). At present, the total protected area is calculated to be around 25% the entire country (Daniels et al., 2010). While often cited, this figure is not providing much information, since it covers everything from traditional "no trespassing" areas to bio-reserves, and around 15% of the space can be described as "open access" for a variety of uses (WCMC, 1992, 1996 in Brandon, 2001). Further complicating matters is different systems in use; for example: "Under IUCN’s classification system, 12.5 per cent of the country is protected, and a goal of 17 per cent has been set” (Campbell 2002, p. 37).

5. Results
During the eight weeks spent in Costa Rica, a total number of 18 people were interviewed:
- 11 farmers in Santa Elena (Pérez Zeledón),
- 3 coffee cooperatives – CoopeAgri (Pérez Zeledón), CoopeDota (Santa Maria) and CoopeTarrazú (San Marcos).
- One organic farmer (San Rafael Norte, about 5 km north of San Isidro in Pérez Zeledón)
- One representative from the Tropical Science Centre, a conservationist NGO who is responsible for the Alexander Skutch Biological Corridor and the Los Cusingos bird watching area
- One technician from the Costa Rican department of Agriculture
- The coordinator for York University’s activities and the Las Nubes Project

The typical size of the farms that were visited was between 2-4 hectares, which would classify the participants as small-holder farmers. In order to protect their privacy, the farmers’ names have been replaced by numbers in the text. Although the issues brought up during the interviews are interconnected, this chapter has been divided and information categorised according to the two central research questions of this paper and an additional part dedicated to a GVC-perspective.
5.1 Land use models and strategies used by the farmers

5.1.1 The Santa Elena farmers
Of the 11 farmers that were interviewed, 8 farmers owned the land they cultivated, often having been farming for their whole life or a minimum of 30 years. The other three farmers leased the land from CA for periods of around two to three years. Monoculture coffee farming was the land use strategy employed amongst all three land leasers; having a very clear explanation in the fact that CA apparently gives them a choice between either coffee or cattle as the terms for leasing.

Amongst the landowners there were different narratives given for the choice of land use. The three farmers that were engaged in monoculture (#5, #7 & #8) answered that they only grew coffee because it was easier to cultivate than other crops (two of them having grown sugar cane before but later changed to growing only coffee) or simply because that is “what everyone else is growing” (see Fig. 9).

The other five Santa Elena farmers grew one or more of the following crops: cacao, sugar cane and/or bananas, and two (#4,#11) also had some livestock in the form of cows or chickens. The reasons given for polyculture differed between economic reasons like the low price of coffee on the market (which made it appealing to have additional income from other produce), to natural circumstances like the additional shade provided by banana trees amongst the coffee plants, to problems with soil quality which made parts of the land better suited for other crops. The participatory mapping method provided some interesting information although not necessarily of the expected sort: out of the 11 farmers interviewed, only 4 of them drew maps with actual explanations of what was grown.

Fig. 9: Example of coffee monoculture in the area. Photo: Miron M. Arljung.
on the farm. This result could partly be explained by the fact that I intentionally gave very few instructions of how I wanted the final product to look like, in order to give expressive freedom to the farmer in his cartography. Another reason probably also has to do with how these 4 maps, with one exception, were drawn by farmers who grew multiple crops, thus making differentiation more relevant. Still, even the monoculture farms were rarely covered only with coffee plants; there were various trees within the farmland that never were marked on the maps by any farmer.

Having trees in the farmland

The reasons for why the farmers chose to have trees on their farmland varied: in the case of the leasing farmers, CA had previously done agroforestry/timber projects on the land and some of the trees were left (see figure 10).

Once a tree is planted, the very strict Costa Rican forest law makes it, as the farmers described it, practically impossible to cut them down. However, there are other factors besides legal that are frequently mentioned for having a more land sharing approach. The most common advantages were: 1) the addition of organic material in the form of dead leaves, 2) the ability of the trees to combat soil erosion and 3) the possibility of having income in the form of lumber. A representative from the NGO Tropical Science Centre in Pérez Zeledón, said that it was good to have trees among the crops since they provided nutrients to the ground. With regards to the shading factor, he was of the opinion that it could be a potential problem with having too much shadow, but that it need not come to that since it was easy with normal upkeep to let the necessary amount of sunshine in. An added bonus of having shaded coffee that he mentioned further was the lessened amount of weeds that would grow. On the opposite side of the spectrum was a representative from MAG, who said

Fig. 10: Example of trees amongst the coffee plants at the plot of farmer (#1). Photo: Miron M. Arljung
that it is better to keep forest and farmland separate because if you have them mixed the fertilisers would be soaked up by the trees, leaving the farming with a smaller crop,

Amongst the cons the main problem mentioned was the abundance of shadow which affected the quality of the coffee growing beneath and increased moisture which promotes fungal diseases. González who managed the experimental farm “La Escondida” for York University, commented on the shadow amount and said that one mistake they did when growing their Las Nubes brand was not only that they grew too many trees, but since the type of trees they had in the farm did not provide any fruits for the birds they were not as beneficial to biodiversity as they could have been (see Fig. 11). The species of trees usually grown in farmlands in Costa Rica are “guava” or “poro”.

Multiple crops
The reasons for having more than one crop tended to be purely economical, though farmer#10 mentioned how he disliked having banana trees since they too could create too much shadow, as well as sometimes hurting the coffee plants if they fall over. In cases when there were multiple crops grown, there were broadly speaking three types of land use:
1) The crops were grown separately in a strict zonal fashion, which seems to be the case when growing multiple crops or larger areas of sugar cane (see Fig. 12),
2) Coffee as main crop intermixed with banana plants as the secondary crop (see Fig. 13), or
3) A gridline pattern, usually in the form of one row of banana plants followed by two or more rows of coffee (see Fig. 14).
Fig. 12: Sugar cane (left) and coffee (right) grown side by side at coffee farm #10. Photo: Miron M. Arljung

Fig. 13: Banana and non-commercial trees intermixed with the coffee at farm #6. Photo: Miron M. Arljung
When asked about the reasons behind such different patterns and whether or not they were part of some particular land use strategy, the answers were often related to the benefits of added organic materials from the banana leaves. Farmer #9 mentioned how it was preferably to have intermixed crops because it made weed management and the application of chemicals easier, farmer #4 that it saved space, and some mentioned the general economic benefits of not relying on only one crop.

5.1.2 The Cooperatives

CoopeAgri
Coope Agri RL, was founded in the 1960’s in the district of Pérez Zeledón, itself part of the wider San José region of central Costa Rica. Formed as a consequence of market fluctuations, decreased government regulation and an inability for the coffee farmers to market their goods (leaving them vulnerable to middlemen), the cooperative had an initial focus on coffee but soon came to expand to include sugar cane and eventually timber, to broaden and increase the sources of income for its members (CA, 2015b).

Stating how beneficial natural conditions improve and help the socioeconomic realities of their participants, CA lists a number of environmental initiatives:

- Conservation efforts (aimed at protecting endemic endangered species from extinction)
- Reforestation programs and sustainable timber operations
- Agroforestry (an inclusion of farming and livestock)
- Collection of organic material to manufacture affordable ecological fertilizers
- Water management and treatment facilities (CA, 2015a)
CA has grown to become a large cooperative with about 8,500 members. After having cooperation with FT for ten years (FLO, 2015) the amount of FT-certified coffee of their total production is about 20% of their production according to vice president Mora. He argues that the main reasons for why they do not involve itself more with FT is that, having so many members would translate to a lot of costs for certification. Coupled with the limited amount of coffee that FT can purchase from them, a larger FT-production would not be worth it profit wise.

According to Mora, there is no particular land use strategy or model that the CA uses, instead they have two general recommendations: 1) diversifying the crops (with sugar cane) as a way to balance out the income when the international coffee prices are low, and 2) to incentivise the farmers not to cut down trees, especially if they are close to the rivers. According to Mora, this is not something new but a continuous work that has been going on since the 1980’s and so predates any involvement with FT. There is an agroforestry department at CA which both provide information on natural resource management and also functions as an intermediary between the farmers and the Costa Rican government in working with PES. Farmers who keep parts of their farmland forested get a sum of money at the end of each year and CA manages the payments as well as help with associated paperwork. Through PES Mora claim that CA create a “win-win” situation for farmers and nature alike. Sales manager Léon also stresses the change in mind set that has happened in later decades in Costa Rica with a new “national love” towards rainforests and conservation in general on the one hand and a stronger legal system for protection on the other, with tree cutting being a jailable offence. With that being said, he also understands the fact that their members need available land for farming and that this can create a potential tension between the two land uses.

CA does their incentivising through the “engineers” who go visiting individual farms and show/inform the farmer about different methods to work the land and encourage the growth of multiple crops (like sugarcane or bananas). There are also community meetings where more general information is given. The key point is that CA cannot force a change upon the farmers, who are free to disregard the advice given. León stresses how doing so would only work against the farmers since the purpose of the advice is to help them improve their production levels. All farmers confirmed the fact that they were not obliged to follow such advice. Because of this non-demanding approach, there has never been any conflicts arising over land use according to León. There are also subtler ways that CA can affect land use in relation to chemicals. Both farmer#10 and #11 mentioned that since CA is the only vendor in the area, they can control the chemicals sold to their members by limiting the supply to specific brands.

CoopeDota
Situated in the Los Santos area, a couple of miles north west of Pérez Zeledón lies Santa Maria de Dota, and the cooperative CD. Like CA, the cooperative was started because of problems related to infrastructure, which made it hard for the farmers to reach consumers and in turn to many middlemen along the value chain. In 1929, a mill was bought and CoopeDota was formed (CoopeDota, 2016). In an interview with cooperative representative Ureña, she explained that CD doesn’t have any particular land use “strategy”, though she gives examples of practices like only using organic fertilisers, only green listed chemicals and different projects CD has to conserve water usage or how to work with shade. Unlike CA, CD is foremost a coffee company, so monoculture is more prevalent among their members, though it does not mean that there aren’t farmers who grow other crops. For example, Ureña mentions how some people use avocados trees...
to provide shade for the coffee (see Fig. 15), though CD discourages such practices because the chemical used for avocado farming are very different from and stronger than the types used for coffee; such intercropping also leads to competition for nutrients. Having trees and shadow in the farmland can according to Ureña also provide social benefits for the farmers themselves by creating a working environment that is less prone to lead to exhaustion and dehydration as a result of direct solar exposure.

**CoopeTarrazú**

CT is lies closely to CD (less than an hour relative distance by car) in San Marcos de Tarrazú, a high altitude mountainous region (see Fig. 16). According to cooperative representative Calderón, CT have been FT certified since 2005 and today all of their members are producing under the FT label. Around the same time as their FT-membership started, a special sustainability plan was established in order to improve the environmental impact of their land use practices, parts of this program being financed by FT money and includes training, and capacity building and soil analyses (Fair Trade USA, 2016).

When asked about land sharing/sparing strategies, Calderón clearly identifies the CT approach as the latter with a clear distinction between the 40-45% of land that is under some form of protective status in the area and the agricultural land. According to Calderón it is not very likely that one type will absorb the other since: “the agricultural frontier is already reached”. There has been a discussion within the cooperative about the possibilities to engage in some form of (agro)tourism, but it is still on the planning stage.

Calderón explains how the whole of the Tarrazú region works with shaded coffee, with an average shade percentage of between 30-40%. Concerning the type of trees used they can differ but the most common type is the “poro”, and a majority of their members also use intercropping with banana, avocados and orange trees. Just like with CA, Calderón point out how having trees within the farmland provide additional organic material to the ground that provide nutrients. In addition to this, CT use the pulp that is left over from the coffee processing factory and transforms it into organic fertilisers which is delivered free of charge to their members. There is no organic farming in Tarrazú however as (green label) chemical fertilisers are also used since the nutrient levels in the soils are generally very low in the region.
5.1.3. Conventional Vs Organic farming

Although not the focal point of the investigations, when it came to land use practices the farmers though less in terms of land sharing/sparing and more in terms of conventional and organic. There is also a clear correlation between the two: land sparing often meaning intensification (through external chemical input), while land sharing means using ecosystem services and biodiversity to reduce chemical use. In addition, when pursuing this line of enquiry through the interviews the farmers often expanded on how political and economic dimensions of the value chain affected their land use. However, as I came to discover, organic coffee farming means very different things depending on who you asked. Because of this, this sub chapter is divided into two parts, part 1 with the arguments and perspectives from the conventional farmers and their cooperatives, and while part 2 focuses on the one organic farmer from MT I managed to find.

There are some Santa Elena farmers who, while not being completely organic, still mixed conventional and organic practices. Farmer #2 argued that the chemical fertilisers don’t have all the nutrients that the soil needs to remain healthy, thus he intermixes it with chicken manure. In a similar fashion, he claimed that conventional pesticides kill all bacteria in the ground, including the ones that are “good”, thus being bad both for production but also for the environment. Farmer #3 said there were organic means to combat the “roja”, naming a chalk based compound that is cheaper than conventional pesticides. Farmer #4 also mentioned how strong chemicals are also bad for your health and can also affect the coffee negatively. Amongst the other part of the spectrum, farmer#2 told me “If you work with organic, you might as well close your doors and go home to sleep”.

Fig. 16: The community of San Marcos. The CoopeTarrazú coffee processing plant is visible in the lower part of the picture. Photo: Miron M. Arljung
The reasons given among the chemical using farmers for why chemical inputs differed a bit from farmer to farmer but fundamentally it boiled down to the fact that the amount harvest that is possible using organic methods is much lower than with conventional; about 50% according to most participants. The reason for this comparable decrease in production could be explained by:

1) **The rate by which the coffee would grow** without the standard fertilizers would be much slower. There was a flip side to this however, namely how the quality of the bean would be greater without chemical use because of the lower growth rate. This relationship works both ways, meaning that the faster growing conventional coffee has comparably lesser quality.

2) **Parasitic attacks**, chief among them “coffee rust”, or “roja”, which is a red/yellow coloured fungus which attaches itself under the coffee leaves, spreads rapidly and easily from one plant to another and can kill large numbers of plants. Apparently, there was one farmer in the area who did try and grow coffee without the use of chemicals but his harvest was completely destroyed by coffee rust. The “roja” was also a reason that was brought up as an explanation for why there was little eagerness to grow trees within the farmland, since that would increase humidity levels and thus make create a habitat more appealing to fungus growth.

Alongside the coffee rust there are also nematodes, worms living in the soil that can attack the root system of the plant, as well as the coffee borer beetle called “broca” which borrows into the bean and leave small black dot as evidence of the intrusion, with a lower quality bean as a result. Apart from practices like pruning or chemical use, the Santa Elena farmers also tried to combat these diseases and pest by experimenting with new coffee plant varieties, like the “Obata” that some farmers are now beginning to grow that is said to be more resilient to the coffee rust. When asked if this would encourage organic farming, since fewer pesticides would be needed, the answers were mixed; some people thought that this might be the case. At the same time, as farmer#9 mentioned, the “Obata” is also a high producing variety, and from his perspective there’s little sense in purchasing something like that just to switch to organic and half the production.

There were other biological reasons given for conventional land use. For example, the amount of weeds increases if you do not apply any pesticides, resulting in a lot of time/work spent on removing them, either by hand or by machine. In addition, the rate by which the weeds grow back is apparently so fast that the removal process must be redone every two months. As farmer#9 described “once you've cleared one area of weeds by machete it will be time to start over again”. Some farmers also mentioned economic/practical reasons as well, that while the price was better for organic coffee generally, the vast majority of the coffee farmers in Santa Elena are members of CA, who don’t differentiate between organic and conventional coffee when they purchase the beans from the farmers. I asked vice president Mora from CA about this and he confirmed that this was the case. The reason why was because it would cost too much to differentiate between organic and conventional coffee since there are so few organic farmers in the area. If they were to get more organic farmers in the area in the future, so that it would be more feasible for CA to buy and sell organic coffee, then they would start paying different amounts depending on type according to Mora. He also explained how CA is currently conducting investigative research in order to find a way to balance the lower amount of harvest that results from using organic methods and the expenses/prices paid for this type of coffee.

When interviewing the other cooperatives, the picture which emerged was to a large extent very similar to the Santa Elena case. Both Ureña from CD and Calderón from CT described how they
would not work organically because you will have a production reduction of between 40-50%. This is hard since the majority of their members are smallholder farmers with an average farm size of 2-3 hectares, which would mean a very low harvest. In order to compensate for that the increase in price would have to be so large that nobody would be willing to buy.

In the case of CT, Calderón explained how their coffee is already one of the most expensive coffee brands in the world because of the special characteristics they get from the region. As a result, it would not make sense to halve your production and sell it even more expensively when they already get such a good price. Since conditions are different in other regions of the country he thinks organic coffee farming could perhaps be a more feasible strategy there, but not in Tarrazú. With a similar logic, Calderón told me how the Tarrazú region do not have as many problems with coffee rust because of their average height of 1500-2000 meters above sea level. They still apply chemical pesticides to combat them but he says that the more effective method of mitigating fungus attack for them is adequate shade control and other local land use practices.

Ureña from CD also mentions that since you have to undergo a transition period of 5-6 years when changing from conventional to organic farming, there is also a question of how the farmer will manage economically during this period. González from the Las Nubes Project also mentioned the transition period from conventional to organic as important and likewise explaining how is not likely to happen without any technical or other assistance or economic compensation from the cooperatives. Lastly, Ureña told me how there would also be a problem of contamination if one farmer would go through with such a transformation but his neighbours would not. According to Ureña, the environmentally friendly practices that CD do have are very good and thus there is not such a large difference between their sustainable agriculture and an organic one.

With regards to the government’s plans and policies for Costa Rican agriculture, the focus according to the MAG engineer is on technology, like micro processing plants that can help coffee farmers get better income, and different ways to improve productivity. This is especially important since so many farmers are smallholders. With the international coffee price always fluctuating, this is a challenge however since it discourages a production increase since the reward would still marginal. With this context, organic farming is not an attractive alternative either because of the large decrease in production levels and the long transitional period of five years it takes for the ground to get rid of all the chemicals.

The organic perspective

It was only in the later stages of my field work that I happened to hear from one of the Santa Elena farmers that there did exist one organic coffee producer in the Pérez Zeledón region, living a small ride up the mountain path up towards San José compared to Santa Elena. This farmer #12 was a member of the small coffee producer MT which he managed together with six other organic farmers. Although coffee is the first and principal of #12’s crops, he also grows a multitude of others, such as citrus, banana and sugar, as well lumber trees (see Fig. 17). He also has a number of animals on the farm, including cows, a horse, chicken and fish (see Fig. 18). He told me that the reason he had many crops is that “without diversity there is no organic production ... The conventional agriculture is mostly about producing one prime product and it creates a dependency on the market; an economic dependency and a vulnerability. Organic agriculture tries to be strong and not depend on what they pay and I don’t have to beg. I'm not pressured to selling”.

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He explained how the diversity of products also help create a synergy within the farm, like for example how animal manure can be used as fertilisers, low income crops could be used to feed the animals etcetera. Unlike any other participant, farmer #12 also answered yes with regards to if he had any specific land use strategy. He mentions how one of the key aspects of organic farming for him is working with nutrient cycles, working with biodiversity to provide and produce the resources needed on his farm. He doesn’t label his approach like agroecology/agroforestry or the like but just “organic farming”.

He is quick to criticise the type of “sustainable” farming used and promoted by the cooperatives, because they only lessen the amount of chemicals use, not stop it. In his opinion, this “sustainable” agriculture, together with the current national political policies, is a reason for why there is a large type of “organic yield gap” between the amount of organic products that Costa Rica could potentially produce and the ever decreasing actual numbers.
He claims that the engineers and other people involved in giving advice for conventional agriculture know that the chemical use kills even good bacteria and the like but that it is in the interest of multinational corporations like Monsanto to have a situation where the crops need chemical input. In other words, powerful actors base their policies and recommendations on this need for profit. He also claims that government is in on this and helps stimulate this kind of development. When asked about this, the engineer from MAG claims that while this type of policies might be true for some countries like the US, it is not true for Costa Rica, nor has it ever been.

I was interested in farmer #12’s opinions about the lower organic harvests that the conventional farmers were all referring to, and although he did confirm the almost 50% relative decrease in production, he pointed out how the market for organic farming is more stable and that unlike conventional farmers he does not have to worry about ever increasing costs for chemical inputs. Although his land use is guided by the principle of closed nutrient cycles, he does add some inputs like algae importer from Spain to help fertilisation, or chalk. The important thing for him is to, as far as possible, recreate the natural environment of the mountain and a system based on equilibrium. This type of environment provides different services like natural types of fungus that can help combat the coffee rust.

According to farmer #12, organic farming gets a bad reputation for not being profitable. His counterarguments are: 1) organic coffee gets better payment than conventional, 2) even if you can make a better profit from conventional through larger production levels, the diversification of organic farming still makes the economy more balanced and safe, 3) there are health and other aspects of organic farming that is not hard value, so they do not get included when comparing simply economic figures. Taken together, he believes that the comparably lower productivity of organic farming plays into the mental image many Costa Ricans have of agriculture and the countryside as being behind, full of “stupid” people without an education or possibilities for the future. He on the other hand is proud of his profession and that being a farmer is “the best title I have”.

Just as is the case for the cooperatives, there are inspections each year to see that regulations are followed. Since these can differ between the Costa Rican, US and European market respectively, there are a lot of different norms that must be followed. As an organic farmer, there are also specific inspections made by a third party recognised by MAG that comes three times a year. To help Madre Tierra and other organic producers, are a number of NGOs as well as the Fairtrade organisation (they have been certified since 2004) who help them with various things, most importantly to get access to these foreign markets and potential customers. Last but not least, farmer#12 commented on the more active land use management and philosophy of his organic farming in relation to conventional: “Now, with respect to the conventional farmers, they don’t like to work much. With organic you have to work much; you have to spend more time on the farm. It doesn’t matter if it rains, I still have work to do with the cows and other. For a conventional farmer, what happens when it rains? They go back to the house because they have all the chemicals that do the work for them. It’s a philosophy to work less and gain more and the’‘conventionals’’ say that with organic you work more to produce less.”

One of the key issues for #12 is creating a motivation for conservation and organic farming, based on benefits. “When the farmer feels that you are invading his territory he will react against it. The
conservationist, who isn't a farmer, wants beautiful nature, he does not live there, eat, have a
salary…. So the farmers' needs to be part of the sustainable development of both the parks and the
reserve and the production”. He argues that if you get eco-tourists to the area but their visit is
limited to the protected areas, the farmers will still not be engaged. If, however, tourists would visit
some well-run farms, there would be a stronger incentive to engage in conservation.

In short, farmer#12 does not believe in this kind of divisive conservation politics, nor the land
sparing argument either. He brings up the issue of increased chemical use that might arise as a result
of the intensification process and how animals that move between protected/forested land and
farmland would be affected negatively as a result. As an example he mentions how the pesticide
used to kill parasites not only kills additional organism but also risks leading to an evolution/
resistance which would not happen in an organic farm, since there exist other organisms which
would eat the parasites and dispose of them naturally.

5.1.4 Relationship between farming and conservation
At the centre of the land sparing/sharing crossroads is the relationship between agricultural
production and nature conservation, so after having questioned the farmers and cooperatives about
the factual state of the land, the last piece of the puzzle is thus how the farmers felt about the
relationship between farming and conservation in general.

A case in point was a question about the Alexander Skutch Biological Corridor and if being within
the borders, as well as a relatively short distance away from Chirripó National Park had any effect
on their land use. The vast majority of farmers answered “no” to this question; farmer #2 didn’t
know that his farm was within the corridors’ borders. With regards to the national park, five farmers
said that they visited the park on one or more occasions. Only farmer#10 answered “yes” in relation
to having trees in the farmland, saying that one reason that they had a lot of trees was because of the
corridor. The answers shouldn’t be any indication to any hostility or disregard towards the corridor
though, as farmer#9 and #10, while answering “no” still said that they though the corridor was good
and that being close to protected areas was beneficial because of opportunities for tourism. Farmer
#9 summarised the issue by while also providing a clear example of a land sparing rhetoric : “not
many people are aware of the corridor and some people have no interest. It's going to be very
interesting when you can get some economic benefits from it, for example getting visitors every
month for visiting saved forest in former farmland”. Farmer#5 alluded to these kinds of benefits
when he mentioned how the now discontinued “Las Nubes” coffee brand provided increased
opportunities for marketing.

The history of the corridor is in itself an example of land use change since the land was originally
coffee farmland that the German biologist Alexander Skutch bought and let regrow into secondary
rainforest. The fact that the biological corridor does not seem to have a major impact on their
farming should not be seem to indicate a general disinterest or negativity towards nature or
conservation. While some farmers simply said that nature was important to them in very general
terms (no farmer said “no”), 5/11 Santa Elena farmers also gave a very practical reasons, namely
water. Even though precipitation levels are quite “adequate” for farming in Santa Elena (especially
compared to other areas of Costa Rica like the dry northern province of Guanacaste), the fact that
Chirripó is a source of much of the waterways in the area has not escaped them. In fact, the farmers
have small community teams that gather and discusses water management at a regular basis. Farmer
#3 and #7 also mentioned the benefits of having eco-tourism and #6 mentioned the beneficial microclimate that forest helps to generate.

Overall, the perceived relationship between farming and agriculture showed quite a bit of diversity: 5 farmers either had no real opinion on the matter or simply commented on the fact that the borders between farmland and forest are pretty clear and that the legislation is strong to protect conservation areas, thus avoiding any conflict between them. Farmer #4 explained how coffee and other crops can help cover/protect the ground (probably in relation to pastures), indicating a more symbiotic relationship. Four farmers however argued that there was a conflict; farmer #3 arguing that it was harder to protect nature with more and more people around; #7 said that without conservation measures in the area there probably would not be any forested around but pasture; #6 argued that at the rate new land was getting protected at the expense of cultivated area, the farmers will not have sufficient areas to work in the future.

Lastly, farmer #9 outright said “it’s a war”, criticising how large economies like China or the US are producing dangerous chemicals not caring about issues like contamination, while simultaneously saying that countries like Brazil need to protect their nature: "Let me make money here and throw out pollution while you clean”. He also added that maybe this sort of differentiated responsibilities would be easier to accept if the people who contaminated at least paid just money for him to stop growing coffee and switch to conservation.

**The Las Nubes Project**

Another case in point of how the potential for a harmonious co-existence between agriculture and nature can be found in the Las Nubes project, starting in 1990 after a doctor from Toronto bought a piece of property in the area and later giving it to York university to use for field research. González, the field coordinator of the project, explains how since its inception, a lot of studies have been conducted about coffee growing, biodiversity, reforestation etc. There were also plans to further examine the possibilities for agro tourism that did not come to fruition, though now they have re-emerged together with cooperation from MINAE (the ministry for conservation) and other local stakeholders. The goal of the agro tourism project is to investigate the possibilities for sustainable living which benefits both livelihoods and the environment; with farmers growing multiple crops, having animals, doing soil conservation etcetera. González, brought up two important points as to why despite systems like PES being around for some time, people have been unwilling to change current conventional land use practices:

1) “**People change when things are bad**”. As long as they can still make a living within the existing system/paradigm, the incentive to make a radical change is not very strong,

2) “**The lack of alternative experience**”. The unsuccessful local example of the farmer who stopped applying chemical inputs and lost his entire harvest is acting as a strong discouragement for other farmers to try anything similar for themselves.

According to González, Santa Elena would benefit from having the old “Las Nubes” local coffee brand brought back, but with a local processing plant so that they farmers could produce their own coffee. It is apparently possible to get the necessary machines for free, so the issue is not money but the lack of organisation; an umbrella group which can delegate responsibilities and make such a change possible. At present, there is no such enthusiasm to be found; at the meetings where such things are discussed it is the same people who attend all the time. I visited such a local meeting at
the Tropical Science Centre myself and while being attended by representatives from both MAG, MINAE (Costa Rica; Ministerio del Ambiente y Energía) as well as academics like González and the people from the centre themselves, there was no farmers there.

Farmer #12 from MT, although not located near the biological corridor, mirrors the views of González in that a local coffee mark, like the discontinued Las Nubes brand, would be one of the better ways for the farmers to benefit from the corridor. Whilst not critical of the PES approach, he argues that it does not bring in the kind of community benefit that agro-tourism does. He argues that an agroecological project which in many ways mirror the ICDP logic, has the kind of potential to attract tourists interested in natural protection. This in turn would create a more win-win kind of situation that does not separate nature and people instead of just prohibiting the community to access parts of their land. By so doing, he sees a potential for reduced conflicts and added chance of active interest from the community.

5.2. Fairtrade and certification
Before going into detail about the importance that FT certification has for explaining the land use patterns observed previously, one immediate and important observation to make is that certification (like “organic”) turned out to mean many different things depending on who you ask. Both as an illustration of this and as a disclaimer, it is worth noting that as the interviews with the Santa Elena farmers went on, I became aware that my interpreter didn’t seem understand what certification or Fairtrade was. This meant that the answers I got have more to do with what the farmers thought about the different brands of coffee available on the Costa Rican market and not about FT certification, mirroring the findings of Ronch (2002). With this in mind, the most common answer turned out to be that it was hard for the farmers in areas like Santa Elena to compete with higher altitude coffee. At the time of the interviewing I didn’t think more about this fact, but after I had talked with CA and had the opportunity to visit one of CAs super markets, this made more sense.

![Fig. 19: The share of investment from FT earnings in CA. Source: CoopeAgri (2015c)](image-url)
5.2.1 CoopeAgri

Although CA has been collaborating with FT since 2005 (Sick, 2008) certification has never included all of their farmers. In the beginning there was only one specific experimental farm called “La Escondida” as part of the Las Nubes Project, from York University in Toronto. Things have changed since then and now “La Escondida” is no longer an experimental FT farm, while CA on the other hand has expanded their FT to include 20% of their production according to vice president Mora.

There appears to be only one FT-certified coffee product from CA available at their shops, called “Chirripo” after the mountain with the same name. It is a highland coffee and thus of higher quality and more profitable. The majority of CAs farmers however grow coffee at an elevation of around 800m, which would classify it as lowland coffee. When asked about the role that certification have for Costa Rican farming, the engineer from MAG, argued that FT helps the cooperative sell at higher price but doesn't help the farmer. While the data collected for this thesis cannot confirm nor deny such a claim, it mirrors what has been described in Goodman (2004) about how the need for quality in the GVC can result in the poorest of farmers with lower quality being excluded.

Still, FT does cover more aspects than direct payment to individual farmers. One of these things is 20 cents/pound that goes to development projects. These cover a variety of different themes, some of them directly related to coffee while others can be about local environmental protection schemes, like the Pina Blancas river (see Fig. 19). In addition, there are social programs and labour rules, including a minimum wage which has to be paid to coffee pickers and the like (FLO, 2016b).

Among these some are directly related to land use practices. Sales manager León told me about a big list of rules which you as a cooperative have to follow in order to get the FT licence. These things include for example the prohibited use of everything but so called “green labelled” pesticides and fertilisers. Although CA don’t force any farmer to use specific brands of chemicals, CA does two things which still can affect farmer behaviour in this regard: 1) CA owns a store which sells a variety of products for the farmers to use, meaning that at least all farmers who buy their fertilisers from CA can’t buy any products that FT would have banned from use, 2) The free transportation of fertilisers would also be of brands sold by CA. CA also have inspectors that come visit the high quality, FT-certified coffee farms to check that the rules are followed. These kind of inspections, as well as getting the certification in the first place, costs money which the cooperative has to pay to the FT organisation. When asked about if either CA or FT promotes any specific land use model or strategy the answer was negative.

Amongst the Santa Elena farmers, #9 was one of the few ones who both knew about FT and had quite strong opinions on the matter. He claimed that when the concept of started it was a good idea, but nowadays the big companies, like Nestlé or Starbucks, like to use that same vision to make more demands and try to change how you can use your land. In addition, the farmer criticised FT’s organic policy, with the key issue being price; even though Fairtrade likes to buy organically, the amount they pay is too low and doesn't recognize the additional workload involved nor the fact that you as a farmer are helping the environment – in the end you only for the physical produce. He also addressed a problem with the demand/market for organic products in general, which is that “people talk and talk about organic but in the supermarkets they refuse to buy products with a small black dot”.

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5.2.2 CoopeTarrazú

While CA has a part of their production FT certified, CT have 100% of their coffee certified according to cooperative representative Calderón. They started their cooperation in 2005 (Fairtrade USA, 2016) but also have a smaller percentage (20%) certified under Rainforest Alliance. Just like with CA there are annual inspections conducted in order to see that no unauthorised chemicals etcetera are used on the farms. Calderón pointed out that the cost of monitoring is not paid by the individual farmer but the cooperative. In addition to the monitoring costs Calderón speak of how the price that the cooperative has to pay in order to get the FT is “significant”. Still, it is worth it because of the extra money that the farmers receive in payment as a result. Although CT has two certifications, Calderón mentions how they fulfil different types of functions: FT, while still having a number of environmental standards is more focused on the social and economic dimensions of the trade. RA on the other hand deals more exclusively on the environment. Furthermore, some of the importers of CTs coffee have special standards and requirements of their own, like Starbucks who have what they call Coffee and Farmer Equity (C.A.F.E.).

Like the other cooperatives, CT also uses engineers who likewise conduct individual visits to the farms and provide technical assistance, soil analysis etcetera. CT also works with what they call a capacitation program to provide knowledge and information to the farmers, a program which according to Calderón has reached 2300 of their members. Unlike the other two cooperatives however, Calderón describes how the Tarrazú region has undergone a major transformation with regards to land use during the last 30 years, moving away from a situation characterised by heavy exploitation of the land and substantial chemical use. 20 years ago this started changing and a “sustainability program” was developed. Of major importance in this case is that this program was established in order for the cooperative to obtain certification. It was hard work to change, but because has these practices resulted in more stable production levels and better income for the farmers, it was possible to convince them to change. According to Calderón, since the coffee business is so central to the livelihoods of the people in the Tarrazú region, they look closely to the results of their neighbours and so positive results are the best way to promote change.

5.2.3 CoopeDota

Unlike CA and CT, CD used to have an FT certification but since 2011 they do not any longer. Around the same time, CD became the world’s first carbon neutral coffee producers (CoopeDota, 2011). The reason why they quit the FT collaboration was partly because of the bureaucracy involved, partly because, according to representative Ureña, the money from FT does not result in any major benefits the farmers, unlike the case with RA. She argues that being a cooperative, CD is already “fair trade” in principle and that they were following a lot of the FT rules and regulations already. In conclusion, Ureña says that FT is not worth the cost “just to have a title hanging on the wall”.

Just like the case was with CA, Ureña claims that CD certification has not had any major effect on how the cooperative has been encouraging its members to use their land. Similarly to the how it was with FT, she says that the new carbon neutrality is mostly about keeping measures of what they had already had been doing, making the actual certification “the cherry on the cake”. At the same time, she also mentions how “the process helped us to be more efficient” with resource management like water, energy and fertilisation. CD also has engineers that work with the farmers and teach them
things like optimal amount for and timing for the application of fertilisers; not only leading to economic savings but also less pollution.

In order to get the RA certification, the farmers need to apply individually, after which they will get inspected to see whether or not they comply to the requirement. If they don’t they get informed of what to change and how so that they can pass a future inspection. Comparing to CT’s 100% certification rate (at least for FT), Ureña explains how that is not any current plan for CD. First, getting a certification is a voluntary measure and not something that the cooperative enforces. Second, she argues that the more farmers who become certified, the more there are who “have to share the cake. To keep them [the certified farmers] happy and because not everybody follows the rules, it's not fair that they [non certified farmers] should have a piece of the cake”.

5.2.3 Madre Tierra
Farmer #12 says that for him and his fellow organic farmers who make up MT, FT provides a lot of advantages. One of the most important ones is price, because the combination of FT and organic farming gets double the payment and is altogether a much stronger brand. Other advantages include access to international markets, something he also gets from being a member of the “Asociación Allianza de Familias Productoras Orgánicas de Costa Rica”, whose supporters include many European NGOs, including the Swedish organisation We Effect.

5.3. The Global Value Chain for Coffee

5.3.1 Costa Rica’s place in the coffee trade
In order to understand the farmers’ behaviour and land use rationale and the potential effects of certifications like FT on land use, it is necessary to recognise the importance of price and the changes characterising the global coffee market. This is because price is the carrier a large degree of information, ranging from societal factors such as the expenses of the farmers and the cooperatives producing the coffee, natural factors like yearly variations in weather, and the demand for specific types of coffee at the consumer end. Notwithstanding the role of all these other factors, the rationale that most openly and strongly seemed to affect farmer land use and in turn their willingness to and nature of cooperation with certification organisations like FT, is economic feasibility since it most directly impacts the farmers’ livelihood. The importance of a balance between profit/production and environment is voiced by Nureña from CD who stresses that coffee farming is a profession, and that the farmers have families to support. There are however ways by which she sees possibilities of a more win-win situation, for example CDs practice of planting endemic species in between the coffee that can be used both as a carbon sink but also to provide additional income in the form of timber. At present this sort of land use practice is not yet the norm amongst the CD members.

As explained in chapter 4.2, coffee prices and trade conditions has changed often for Costa Rica. González from the Las Nubes Project explained how the “golden years” were during the latter part of the 1970s. Because of the impact that Brazil, one of the larger coffee producers (producing around 60 million sacks of coffee each year) has on the market, one of the chief factors which affects coffee prices in Costa Rica is the Brazilian weather; if the rains have fallen as usual production will be high and prices low and vice versa. In conjunction with a developing competition globally, the market has shown signs of saturation, at least this seems to be the case for one of the largest importers of Costa Rican coffee, the US. This trend González believes could be
somewhat offset by a growing market in Asia where countries like China are consuming increasing amounts of coffee.

León from CA describe the volatile markets as a challenge: “*Most of our production depends on the market and that is completely beyond our control. The prices [sales] the last 20 years have not been enough*”. Counter this somewhat is national and international policies (including the increasing use of different trademarks and certification practices) which have created more diverse export opportunities. Ureña from CD expresses similar thoughts about how things were “worse” before but how the modern trading climate, with the rules of the trade and the use of certifications (like carbon neutrality) has created a better position for the cooperative. One of the more important aspects in this regard according to Ureña is a longstanding relationship with the importers which can lead to better prices, although the overall market value will still be fluctuating. The relationship to the importers is important not only in terms of getting better terms of trade but with regards to land use, since different markets have different standards. Ureña mentions Japan as a market that has particularly high health and quality standards.

### 5.3.2 Markets and importers

The amount of quantitative data that could be collected differed from producer to producer, which makes a straightforward comparison harder to do; CA managed to provide some annual reports, while the other producers only could give general figures during the interview sessions. Nevertheless, enough information was gathered to find some common ground.

![Fig. 20: Coffee production statistics for different geographical scales. Source: CoopeAgri (2015c)](image)

Going through the statistics provided by CA, it becomes apparent that the national coffee production has fluctuated between circa 2 500 000 and 2 000 000 tons per year, with great variation between different years (see Fig. 19). It also becomes apparent that the Pérez Zeledón production levels follows quite a similar trend, constituting around 12-15% of the national production overall (the blue line on the left axis on Fig. 21). However, if one breaks down the data and focuses on the local production of the P.Z. region and CA production specifically, a slight downward trend is noticeable during the same timespan (see Fig. 20), where the latest year on record, 2014, is around half that of the previous year.
This slight downward trend is also noticeable if one studies the importance of coffee for the revenue of CA (see Fig. 22).

The statistics show a couple of important points. First, it shows how CA has changed from its original roots as an agricultural cooperative to have around 50% or more of their income coming from sources other than farming. Second, although it could well be changing in the future, at present coffee plays a more marginal role with regards to revenue. There could be a number of reasons for this and to speculate about them is not the purpose of this thesis. However, the effect the diminished role of coffee has on the farmers and how they use their land is. During the interviews with the Santa Elena farmers’, they were given an open question about how the conditions for coffee farming has changed during the last 20 years, that is after the deregulation of the coffee market through the abandonment of the International Coffee Agreement (ICA). This gave the farmers the freedom to mention both economical and climatological changes.
On the one hand, farmer #1 said that, presently in the Pérez Zeledón area, the production/acre is too low for good economic profit, especially if you are leasing the land. The low prices are then combined with the added cost of fertilisers/pesticides (being the chief expenses) and salaries for the coffee pickers to further shrink the profit margin, according to farmer #6. This is becoming more of a problem since the spread of coffee rust and other parasitic attacks are increasing. Together with the issues of erosion, and decreased nutrient levels in the soil (farmer #2, #5 and #6), the more acute problem for some appears to be keeping production levels up (León from CA also commented on this). On the one hand, farmer #4 mentioned how maintenance related costs related like parasitic attacks change has increased. On the other hand, he argued that whilst having a very fluctuating price, coffee is still a good choice of crop to grow since there will always be a market for it, and that it is a source of labour in the area.

Another important aspect then of the coffee trade connected to production is exportation. Not only does this show the geographic linkages in the value chain, but it also has a direct effect on land use, since different markets have different rules and standards that need to be met in order to export (this being especially true for organic coffee). The chief importer for all of the producers is United States (see Fig. 22), though the percentages might differ from year to year and from company to company; there wasn’t enough statistics provided by all of the cooperatives to be able to fully compare them over any longer timescale. A unifying factor for all the cooperatives is the fact that most of the production is exported abroad; only around 10% is consumed within Costa Rica.

Important to note is that there can be a difference in kind between the different markets. The type of coffee that is exported is of the dried variety, most commonly referred to as “the golden bean” or “green bean and represents the best quality beans. However, only the 10% of the coffee production that is sold for the domestic market has gone through the additional stage of refinement that is roasting. There is a slight difference between the cooperatives with regards to what coffee goes through what process; Calderón from CT claim that it is the same type/quality that is being sold for foreign and domestic markets alike, while León from CA on the other hand says that while the quality of the coffee being sold in Costa Rica is good it is lower than what goes on export. Regardless of what might be the case for the individual cooperative, the fact that the majority of export is dried and not roasted shows an important aspect of the value chain, namely how the worth
increases as one moves up, through refinement. Although the theoretical possibility of doing the whole refinement process exists (given that there would be enough money to invest in the necessary machinery), Calderón from CT explains how the importers don’t want to import roasted coffee; they want only the dried or “golden” beans in order to create their own blends using techniques specific to the individual companies.

This begs to question how much information the coffee farmers have about the way the coffee travels and who the person is who, in the end, will consume the product they have grown. When asked, the vast majority of farmers answered either “no” to this question, describing in very general terms how it is being sold abroad and consumed by “foreigners” and the many middlemen involved that make it hard to know. One the one hand farmer#2 expressed how CA claims there is no middlemen between them and the customers, but that he didn’t know if that was true or not. On the other hand, farmer#4 mentioned how CA tries to cut out the middlemen and that this has changed for the better the last years, while farmer#5 said that CA sells abroad with no intermediaries. Three farmers did however mention knowledge of certain specific importing countries like China, US, England and Canada; farmers #3 and #6 bringing up the fact that the best quality was exported and that the remaining lower quality (#3 mentioned the figure 25%) of CAs production was for the Costa Rican market. Farmer #12 from MT was the only farmer who showed a greater deal of certainty regarding “end customer” since many of them buy directly from his own café. He claimed that this is advantageous since both in terms of a certain agro tourism this enables, but also in creating confidence and recognition among the customers.

It is important to note that the issue of middlemen/intermediaries can be somewhat confusing since it appears to mean different things to different people. Calderón from CT spoke about “direct trade” for CT meant selling directly to Starbucks or other international buyers with no additional middlemen in between. CT currently export 75 % of their coffee in this manner but aim toward 90-100% in the future. In order to achieve this, one key challenge according to Calderón is able to more “fine markets”, which he claims is hard for producers like CT who produce large quantities but easier for micro-mills. This framing of direct trade is of interest since it still involves at least one seller between the cooperative and the final consumer. The Santa Elena farmers, when talking about the issue of middlemen, mentioned how it is they who make all the money. Farmer #5 said there were no intermediaries in the case of CA, #4 that CA “tries” to sell directly to the customers and have improved in this over the years, while #2 was sceptical and said that CA claim there are no middlemen “but who knows?”. Farmer #9 in particular talked at length about exportation, saying it is a big problem that foreigners are the ones that control the trade. Farmer #9 also grew cacao, so he illustrates his point by another product namely chocolate. He questioned the logic of how some Canadian company make the decision that they should start a new production line for a product that they lack the majority of materials needed to produce; by importing all the required goods a lucrative business is made in the factory in Canada instead of Costa Rica, making the Canadians able to claim the ownership of the final product even though it is the farmers that produced the cacao. In the end, he said that it’s a collective fault of the Costa Rican people as well as their government that they don’t recognise the importance of power and control over their own prime materials.

To summarise and illustrate the value chain using the links provided by Rueda & Lambin (2013), these are the steps the coffee appears to take:
Cultivating Nature

1) The farm – The farmer (and this is due to the lack of wives’ or other household members’ participation in the study) behaves to a large extent in accordance with Pagiola’s et al. (2004) “perfect market/open economy”-model, where the behaviour that is expressed during the interviews are largely focused on profit maximisation. This does need to be modified though like Lee et al. (2001) argue, since there were small but significant variations among farmers in the same community even though they were exposed to the same pressures (both economic and environmental); the landowning farmers were by admittance from the cooperatives and from themselves free to decide land use unless under specific terms of a lease. Different amounts of trees in the farmland, differences between monoculture and polyculture and/or ownership of livestock and use of manure was common. Aspects like closeness to areas of natural conservation seemed not a direct factor with a possible exception being the value of water coming from the protected mountain areas. The regular community meetings discussing water appear like a voluntary activity not imposed by either CA of FT but showing individual agency and initiative.

2) The purchasing point – Since this is owned by CA (or the other cooperatives) the collecting stations do not have any immediate power apart from the individual judging of quality done by the people employed there, though it should be noted that the evaluation is done in accordance to cooperative guidelines.

3) Milling, transporting and exporting – From this point on the value chain needs to be divided into two parts since all three cooperatives had both domestic processing and sales capabilities and foreign exportation, although the balance between the two is far from even (10% Vs 90% respectively). The beans are transported to the processing plant the same night as they are collected, where beans that are destined for exportation are sorted out to include only the best quality. Apart from this sorting, regardless of destination, every bean is going through the same process of cleaning, peeling, and drying in line with what seemed to be “normal” quality standards. There were slight variations in terms of how each stage was made – CD for example practiced sun drying and appeared to have an ethanol manufacturing part, but such decisions were seemingly taken by cooperative management and not by the farmers (at least not directly) nor certification agencies.

4) Importing and roasting – The smaller batch of beans for domestic consumption continue on to be roasted in factories I did not have the opportunity to visit, so I can’t comment much on this stage. In terms of exportation, a variety of importers and destinations were present which ranged from importing firms to specific chains like Starbucks (in the case of CT). The coffee destined for North American, European (and to some extent Asian) markets are then roasted according to buyer standards and possibly mixed with coffee from other destinations to create brand specific blends. Certification organisations like FT have a more important role at this stage, where in cases like Madre Tierra’s it can open access to more (particularly niche) markets. As indicated by the interviews, such decisions are not within the power of individual farmers but rests within the purview of the cooperatives.

5) Distribution – Domestic production was distributed to a range of purchasing points, from supermarkets owned by for example CA to more general food stores or even served at coffee shops owned by the cooperatives. As can be deduced from previous research, the major international markets operate in a similar fashion but at a larger scale involving more potential middlemen and distribution channels.

6) Pricing – FT can have a large role in this case with their minimum pricing and premiums for organic coffee, otherwise it is completely open to the final distributer in the chain to set their own price. This means that the price paid by the final customer can be a great deal different than what was paid to the farmer by the cooperative and/or by FT.
6. Discussion

6.1. Land use and farmer logic
One immediate and in sense one of the more interesting findings that emerged from the participatory mapping was the fact that even though details about specific practices or methods were given, only the organic farmer claimed to use any particular land use “strategy”. The reason why this is interesting is that it mirrors what was described in chapter 2.1 of this thesis, namely how the discourse and logic of conventional farming appears so dominant that it does not need any particular labelling; it is “normal” and can then best be defined by its opposites - what it is not. This does not by any means indicate that the farmers nor the cooperative representatives are not acting as rational agents that have reasons for their actions (as will be shown and discussed below), but instead it becomes of increasing importance to understand the diversity that still exists within the communities and why conventional land use is so strongly rooted.

Since coffee is a cash crop, the fact that a strong economic rationale was presented by the farmers as the primary explanation for their land use was not unexpected; it would be remarkable if the farmers would engage in land use practices which had negative impacts on their livelihoods. Rather, what is interesting is how little “nature” figured in as a parameter, including both relationship to the nearby conservation areas as well as agrobiodiversity. In a sense, this makes a categorisation in terms of land sharing/sparing harder at first glance since by definition there is always some environmental reasoning behind them both (see the four zones in Fig. 2 on page 17). Nevertheless, land sharing was an easy way to communicate the idea of multi-purpose landscapes to the participants and gave a number of relevant observations.

First of all, while there could be some merit in trying to measure “degrees” of land sharing by quantitatively calculating the number of non-coffee plants per hectare (or something similar), the case of “La Escondida” shows how planting of trees is not inherently beneficial to biodiversity by itself but that a conscious selection of species must be made in order to be advantageous to for example birdlife, as was explained by González. This points to the fact that land sharing as a strategy (should) include a conscious decision and planning from the farmers’ side and not a statistical/mathematical procedure. Comparing to Pascual & Perrings (2007) and the principles behind PES, this also showcases how it can be hard to “internalize” natural values and how designating an area “worthy of protection” can be both difficult as well as unsuccessful if nature (i.e. non agricultural, forested land) is considered inherently valuable without first analysing biomes, biodiversity etcetera.

Second, as described in chapter 5.1.1, 50% of all farmers that were interviewed practiced monoculture, however this didn’t mean there were not any trees in the farmland. This brings to attention the fact that a land use strategy with land sharing traits (i.e. plants used for other purpose than commercial harvesting) can exist even if there is no clear environmental reason behind it, another argument that makes labelling difficult. Even in these case though, there were indirect commercial benefits from having trees in the farmland, chiefly related to shade, erosion prevention and organic material added. This logic was also visible in the regular community meetings the farmers had with regards to water usage, the factor most often brought when the farmers commented on why natural conservation was important to them. In other words, although there are
environmental benefits to these measures, mainly from a soil and water perspective, the lack of a nature protection logic could possibly explain why there was some discontent and doubt over these benefits when they are disconnected from or put against the coffee production (competition between trees and coffee for nutriments for example). A land sharing-like strategy that does not work with a win-win outcome is thus difficult to sustain, particularly if put under pressure by changes in economic conditions, mirroring the reasoning of Upphof (2001) and Brandon (2001) on the conditions and possibilities of ICDPs.

Third, the times when the farmers felt were mostly positive to nearby protected areas was when/if they could be beneficial to them in the form of direct economic benefits like eco/agro tourism or PES. In these cases, there was a logic quite close to the land sparing one, where forests could be left untouched and become a form of opportunity cost if compensations were possible. Using Nygren's (1998) terminology this would lean towards an “Environmentalism for Profit” discourse and in a sense this would appear to be the common denominator that was also voiced by the cooperatives. Worth noting though is that eco/agro tourism is not inherently a land sparing strategy. The Tropical Science Centre and González from Las Nubes were more leaning towards some kind of “Wildlife friendly farming” (Green et al., 2005) that would attract tourists more specifically to agricultural practices on the farm rather preserved nature outside it. The organic farmer (#12) was also using a logic more akin to “Alternative Environmentalism” by also combining his rhetoric with a critique of the global economic processes that help create the natural degradation.

Wildlife friendly farming, i.e. “minimise” environmental damage, is in a sense the most interesting approach to agriculture in the Pérez Zeledón context since it pinpoints some of the inherent conflicts and power relations inherent in the value chain. Starting off, it is worth discussing where “organic farming” would fit into the model conceptual model in Fig.2. From the conventional land use perspective, represented mainly by the Santa Elena farmers and to some extent the cooperatives, organic farming appeared to be virtually limited to chemical application and choices were thus relegated to factors such as strength or amount. The paradigm described by Jackson et al. (2007) about the role of input seems be very much the norm. Other ways to minimise environmental damage like trees within the farmland or manual weed clearing were considered time consuming, less effective or competing with the coffee for space. In other words, this was not considered an attractive option by the farmers, something further enforced by the discouraging local example of the farmer who quit using chemicals and went bankrupt due to natural factors like parasitic attacks and the reduced harvests these would bring.

This would seem to indicate that nature “penalises” organic farming, a sort of stalemate at best or a loss (farmer)/equilibrium (nature) situation, since it should be emphasised that surrounding nature is not actively improved in any way by reduced chemical use apart from any natural recovery. While this penalisation is hard to dispute in the sense that every farmer (including the organic) mentioned at lower harvest as a result of organic farming methods, the reason why is not as apparent. While increased parasitic attacks from coffee rust and other parasites are substantial, one need also to consider the environment that has been created through often decades of conventional agriculture:
- Already nutrient poor soils having been heavily exploited through intensive farming practices, leaving it leached of organic matter and so on. Without any external input, it is perhaps not so surprising that these soils are unable to support the same outtake (Castro-Tanzi et al., 2012).
- Through monoculture and strong pesticide usage, biodiversity levels both in terms of species variety above ground (flora and fauna) and bacteria/insect below ground, there is no ecosystem services to speak of that can be used to “combat” parasites or weeds.

- Soil erosion in the Costa Rica farmlands can be extensive due to heavy rain and high leaning slopes, which is especially true for high altitude coffee. I have personally helped coffee farmers with digging holes that would capture soil runoff and know both how physically tough it can be and how long it takes to dig out even a smaller coffee field. In addition, these holes only seemed to last about two years before needing to be dug anew. With no trees nor additional crops that would avoid leaving the ground bare, this is a real problem (Montgomery, 2007).

In addition, this land use would need to be compensated for by society through economic means, and to support bad economies is rarely a welcomed strategy, i.e. the farmers are also “penalised” also by society. This was at least how the farmers seemed to feel towards the same amount of money being paid by CA for organic and regular coffee. This is also directly linked to the value chains since the traditional role of the coffee producing countries has been to supply the foreign roasters with large supplies of cheap coffee (Adams & Ghaly, 2007), meaning that any reduction in production would mean switching suppliers. This could also be indicated by the strategy by CA when asked about the future of organic farming and the answer that it lied in research in more high producing and less parasite prone varieties of coffee. In other words, no direct land use change but a focus on technology.

The contrast with the organic farmer #12 shows that organic farming through a more land sharing or agroecological paradigm could be different, since biodiversity levels in the farmland is encouraged and used as ecosystem services like pest control. The use of manure and the idea of nutrient circulation appears to create a situation more akin to win-win. It could well be argued that the PES approach employed by CA is akin to this, but instead of a situation of characterised by synergies between agriculture and nature it is about compensation. This stricter land sparing strategy also risks dividing the benefits that would come from it, where target group that is supposed to be enjoying the spared nature would in all probability be foreign tourists rather than the farmers. The benefits to biodiversity could also be debatable since, like the Las Nubes project indicated, the quality of forest and nature is the key issue rather than “nature” in general.

The described traditional dichotomy between agriculture and nature risk being present in the PES approach and as was openly acknowledged by some farmers who felt that nature was encroaching upon their farmland due the high protective status of the nearby reserves and the strict legislation regarding tree cutting. In this regard, the relative short distance to areas of nature conservation was more discouraging to organic/land sharing practices than anything else.

**6.2. Underlying factors**

So far, the discussion has mostly been very local and why it does give some insight into what reasoning there is to be found at the bottom of the value chain, a move upwards is necessary to begin to understand both the necessary context and also explain why these land use strategies developed in the first place.

In order to facilitate this discussion, it can be useful to take the conceptualisation of Bosselmann (2012) as a starting point to summarise some of the broader factors at work. As far as the
underlying causes are concerned, the transition that Costa Rica has made in the last 30 years is highly relevant. First of all, the increasingly marginal part of agriculture’s part of Costa Rica’s GDP (Daniels et al., 2010) and the demographic change of in terms of rural-urban migration (World Bank 2013b) has meant farming is seen as a backwards and unattractive profession, as farmer #12 indicated with the teasing of his children in school.

The infrastructure and technological factors, while not having been the focus of this paper, has yet been brought up by the Santa Elena farmers as crucial not so much for land use per say but in a value chain perspective. The issue of middlemen profiting from the absolute distance between farmer and consumer seems to have an important factor for why both CA (CoopeAgri, 2015b) and CD (CoopeDota, 2016) started in the first place. It also affected the Santa Elena farmers since they felt that the limiting transport abilities had a major effect on their membership in CA, since no other cooperative with a processing plant and pickup stations for the coffee was located at a close enough distance. This is reminiscent of what Dankers (2003) write about the potential barriers that long distances can have for farmers wanting to become certified if there are no inspectors/certification body at hand.

On the policy front, a lot has happened in terms of legislation and programmes (Campbell, 2002) that impacts on agriculture through the extensive commitment on conservation and the new “national love” that León spoke of for nature. The role that the Costa Rican government has played adjusting agriculture to this seems to differ between those claiming it has been promoting intensification and monoculture (like farmer #12) and those saying the opposite (Babin, 2014), and without any official documents or statements to go by this thesis will not make any deductions in this regard; sufficient to say that this is an important factor and but that few participants in this study chose bring it up. The international market was on the contrary a much more important actor that at least the cooperatives spoke of more. The market though is complex and at this point it is important to emphasise that changes in for example consumer behaviour and buying preferences of importers in North America and Europe also have been beyond the scope of this paper.

6.3. FT and the Value Chain

To question to what extent FT certification influence the farmers’ choice of land use is not entirely straightforward, especially if consideration is to be taken to the fact that both CD (while being FT certified) and presently CT have additional certifications like Rainforest Alliance, CO2-neutrality and Starbucks C.A.F.E. Practices.

When following the value chain as described in chapter 5.3.2, the role of the cooperatives and particularly the management appears to be pivotal. The value chain would in this case both be more akin to a value hourglass (see Fig. 23): at the bottom is a with a large base consisting of farmers, then a smaller

![Hourglass conceptualisation of the GVC](Fig. 24: Hourglass conceptualisation of the GVC)
and condensed middle with the cooperatives and certification organisations, and a bigger top with a multitude of importers, roasters and coffee houses/supermarkets that ultimately sell to the customers. This is of course an extensive simplification and should not be confused to indicate low influence at the bottom and high at the top. Rather, the image might help bring attention the sort of trickling down of different philosophies, money and practices that takes place along the chain, at least in theory. It also shows how there are many actors involved at the bottom in terms of thousands of farmers, as well as thousands of customers at the end, but a small selected companies in the middle.

In practice, the gathered material shows that things are more complicated than a straight line. To begin with, it was interesting to note how all Santa Elena farmers, apart from the leasing ones who had stricter conditions, were free to use their land as they saw fit regardless of the collaboration between CA and FT; this seemed to also be the case with the other cooperatives. It would have been of great value to interview directly certified farmers and those from other cooperatives to try and verify the amount of freedom, but nevertheless this shows how certification can affect farmers within the same cooperative differently. As a customer, it then becomes harder to know to what extent their purchase is affecting only a percentage of their members or not. As was indicated by the participants’ apparent lack of more detailed knowledge about FT, the potential gains from cooperative FT-membership can be hard to communicate, at least when the cooperative includes thousands of members like CA.

Going through the interview data, the following themes emerged concerning FT and land use:

1) **Altitude**: Both CA and CT began their cooperation with FT the same year in 2005, but after ten years display varying degrees of farmer “participation” (20% and 100% respectively). A remark from CA’s León regarding inspections could be part of the explanation: “we have our inspectors … especially to the high quality farms that we can export as Fairtrade and follow the demands [emphasis added]”. The biggest different apart from size between CA and CT is altitude, and the only FT farms that CA has are their high altitude coffee Chirripó. On the one hand this mirrors the writings of Goodman (2004, p.904) about quality “as an exclusionary force” since those “without sufficient product quality (i.e. bad tasting coffee), typically the poorest in resources and natural endowments, are often unable to participate in the trade networks”. On the other hand, it goes against Sick’s (2008) argument that farmers are better of selling their quality goods to private buyers since FT does not pay for quality.

2) **Cooperative management.** While it appears that subtler influence is possible with regards to chemical use and economic incentives for organic farming, the results from this study indicates that it could be cooperative management that is more key to explain land use than certification. This argument is based on how the three cooperatives had very different experiences both of what it could bring in terms of benefits but also in changes. This ranges from Ureña (CD) claiming that certification had changed very little from their previous land use, to Calderón (CT) who said that much of their current practices originated from a desire to get certified. Particularly noticeable was the attitude towards organic farming, which none of the cooperatives seemed to actively try to convince their farmers of practicing; from what was gathered by the Santa Elena farmers, the lack of support (mostly economic) exacerbated this trend. The organic farmer had not been changed either but had instead used his previous land use philosophy to get what he felt was a better price and market opportunities through FT.
3) **Scale.** In this case it refers both to size of the cooperatives and geographic distance. From a value chain perspective, it makes some sense that a larger enterprise will have larger economies and thus have a bigger challenge communicating with all members regarding land use and strategy. As was described above, limited infrastructural options has been a traditional factor relating to middlemen, and it could well be that with regards to the role of the cooperative management, a farmer wishing to change land use but not having the support (s)he wishes from the cooperative might have little choice. A counter argument to this would be the increasing IT opportunities and ways for smaller farmers like the organic farmer #12 to directly connect with FT or other organisations.

An important distinction thus seems to exist between the farmers that are simply members of a cooperative with a FT-collaboration and those that are directly certified, who follow the more particular demands set by FT. This ties in directly with the study by Raynolds et al. (2004) that the benefits which can be derived from FT-cooperation is closely related to the social and capacity building programmes of the cooperatives, since it appears that it is these programmes that would be the main way which land use practices could reach the largest member base. Given that members from all three cooperatives could not be reached nor all family members of each household, any direct conclusion is hard to draw. Still, it is noteworthy that only 3/11 of the Santa Elena farmers mentioned that the benefits from CA’s programmes (like health, technical assistance etc.) was a reason for their membership, in addition to the apparent lack of knowledge about both FT and the value chain of their coffee. This would mean that any benefit that a CA member then get from FT through the capacity building programmes is not understood as having FT-related money at its core and in turn not creating any goodwill or gratitude for certification.

In addition, only Calderón from CT admits that certification has had any direct influence on their land use, and then it would appear that they adhere more to a land sparing strategy at that, with no clear trend toward more organic farming. Ureña from CD claiming that they already practiced environmental programmes and philosophies close to FT or RA is close to what Raynolds et al. (2004) write about many of the participant farmers of their study already “sharing values fundamental to the Fairtrade movement” (ibid, p. 1115). Farmer #12 from MT was also already organic before his FT-certification and chose to approach the certification organisation because of benefits like networking and access to new markets. This would indicate that rather than FT affecting the farmers it is equally possible FT (and perhaps other certifications) tend to attract those closely minded. The flip side to this would be that farmers who are both most in need of economical or other assistance and/or those with environmental practices of lower quality are either discouraged from or unable to get certification, for example due to limited quality of their coffee or bad infrastructure.

Regarding the voluntary guidelines emphasised by both the cooperatives and the farmers, one the one hand it would seem that no farmer outright practice any land use model too far from their neighbouring cooperative members; even if they apply their own rationale the end result would still be close to aligning their business model with that of the cooperatives. From a GVC perspective would not be hard to explain since the market so closely affect the running of the farm and the cooperatives are the next closest link to this market. On the other hand, if the cooperatives through their own accord or with the influence of FT or another certification agent would try to incentivise the farmers to adapt more land sharing like practices, these would be trickled down through the GVC but not be implemented on any larger scale unless the individual farmer perceives any
economic benefit from them. But how does such information trickle down the value chain at all and where does such strategies originate?

While the chain metaphor in many ways is useful from a crop and trade perspective, from a power and discourse perspective it becomes a bit too narrow, and power would appear to be a key element in explaining the land use patterns that have been observed. Starting with the cooperatives, it was interesting to note how the at least a couple of the Santa Elena farmers (#1, #2 and #9) either were uncertain how many middlemen there were between CA and other partners further down the value chain or considered CA to be another middleman in their own way. As previously mentioned, the definition of middlemen is a bit vague and also leaves out certification organisations like FT. Like Dankers (2003) describe, FT is not a development NGO but a commercial enterprise, which means that profit and good economies are central to their structure and that they must secure income through methods like certifications costs and inspections. As Goodman (2004), point out, this in turn put certification organisations like FT in a peculiar position since they are both working to change the negative outcomes of the capitalist system while working within that same system both as an intermediary and lobby organisation simultaneously.

Without undertaking an extensive discourse analysis, it is important to note how the GVC does not only act as an economic link but also form social relations (Rueda & Lambin, 2013), which in combination becomes a force of power. The question of who FT represent then becomes vital since they occupy that more narrow place in the “hourglass model” (see Fig. 23) where they interact with both farmers and consumers but in different ways. From the consumer end and the creation of what Goodman calls the “moral economy”, FT uses images of and openly claiming to work for the benefits of farmers (FLO, 2016a). Although FT do not claim to represent the farmers, from a customer perspective this can potentially be a not too distant logical leap. When a consumer considers a purchase of FT-coffee, is it intend as an act of support the farmer or FT to in turn support the farmer, or are they mixed to become one entity? Since no interviews with customers were conducted for this thesis, this can’t be discerned. Nevertheless, is a relevant question since it ties into the potential effect certification has on land use, since the creation of market which demands products produced in a certain way is the key method which FT works.

When FT give premiums for organic coffee, they are giving signals which would encourage this practice. Given the very different conceptions of what organic farming could mean, ranging from land use quite close to land sharing to the more restrictive “wildlife friendly farming”, many different forms of organic coffee could exist within this overarching umbrella. It is then not clear what a consumer buying such organic coffee prefers or what they would like to support with their purchase. One the one hand, if FT would be more interested in promoting agroforestry or agroecology, there would have to be a strategy which directly promotes such land use, since none of the cooperatives appear to actively a focus on organic farming in any of its forms. On the other hand, the philosophy of Mare Tierra seems to benefit from and fit well within the FT formula, indicating that the necessary mechanisms appear to be in place within FT to support such land use but not strong enough to actively promote a change towards it.

Being an intermediate located in the middle of the value chain, there thus seems to be challenges in communication both towards consumers and, as indicated earlier, challenges concerning representation and centralisation with connecting the farmers to the cooperative management.
Cultivating Nature

In a sense FT faces a situation not too unlike that of an INGO, which has its roots and their major donors in Western countries, but are mostly working with and try to support poorer people in other parts of the world. If FT should enforce a certain land use directly, they would not so much be supporting the farmers but lobbying towards them; mirroring old imbalances in power and influence. The data from this study does not lend itself to such a conclusion either, given that the only case of admitted influence FT had on land use was with CT, who appear to have done so voluntarily. The data that would indicate the existence of more indirect impacts like those that are the result of capacity building programmes, banning of certain chemicals and premiums, are mostly inconclusive since they affect different farmers in different ways. Again, it seems like there are mostly smaller changes made, mostly having to do with chemical use than any large difference in land use strategy or in relationship to nature. The results of this thesis seem to reflect the “working to change system from within” philosophy that certification organisations have, in the sense that there is no clear evidence of any substantial departure from conventional land use noted at any of the communities. It should also be emphasised that there are of course other factors that can have a possibly bigger impact in creating such a change, like domestic political choices, trade agreements, agricultural subsidies, legislation and more.

7. Conclusions

Neither the Santa Elena farmers nor the three cooperatives have any particular name for their land use strategy and would not by themselves classify it under any particular label apart from broad categorisations like “shades coffee”. The participatory mapping produced similar results which, apart from some zoning patterns, showed no particular emphasis from the farmer on anything they could attribute to any cropping strategy or land use principle. This lack of labelling should not be seen as the absent of any intention, as both farmers and cooperatives alike showed clear purpose with their actions.

First, there was a clear emphasis on high yields, the main reason appearing to be to compensate either for low coffee prices or harvest losses related to parasitic attacks by primarily “coffee rust”. In order to achieve this the land use was often intensive in terms of common and long term applications of chemical fertilisers and pesticides. This strategy was most clearly demonstrated by the practice of many farmers to experimenting with new coffee species like “Obata” which is said to be both higher yielding and more resilient to coffee rust. In general terms, this would categorise the majority of farmers who participated in this study as “conventional”.

Second, notwithstanding the common traits, there were also tangible differences to be found.
- Monoculture was present amongst all leasing CA farmers since this was condition for the lease, as well as for three land owners; the reasons amongst the latter for why included claims of it being “easier to grow”, that it was “what everyone else was doing” or that it provided more job opportunities than other crops. Every other farmer grew at least one addition crop, most commonly bananas or sugar cane and/or had some livestock like cows or chickens. Explanations for this diversification was primarily to be less vulnerable to economic fluctuations,
- Even amongst the monocultures there were seldom only coffee plants present but also some trees which could provide shade for the coffee; banana trees usually filling this role but it could also be non-fruit producing trees like “poro”. The main advantages to having trees was mostly having to do with shade, but could also include additional organic material from dead leaves or
decreased soil runoff rates or additional income from timber production. The least common answers were the cooperative CD uses trees as a carbon sink and MT who used natural vegetation as a way to mimic a mountain habitat and associated ecosystem services like fungus to combat parasitic attacks.

Third, if used in their strict sense, both land sharing and land sparing are primarily used to express intentions of being environmentally friendly, either by integrating forest trees or sparing them by “sustainable intensification”. If so, no farmer would qualify as either since the expressed intention and primary purpose of all land use was to increase profit. However, also assumptions regarding the relationship between agriculture and nature are embedded in these land use; synergetic co-existence for land sharing and competition/compromise for land sparing. From this perspective, there were clear signs of land sparing logic underlying most land use, as expressed by the understanding of the term “organic”. From the interview data, it became clear that organic for all conventional farmers primarily meant “no chemical use”, with no change in other land use related practices like cropping patterns, soil management etcetera. This also ties in with the quote from farmer #12 about organic agricultural land use actually being more intensive not in the sense of inputs but manual labour and (more importantly) planning than conventional farming who can let the chemicals do the work for them.

The consensus amongst the farmers of the expected result from such a change was in the best scenario a 50% reduction in yield size or in the worst case scenario decimated harvest due to parasitic attacks. A substantial monetary compensation would be needed for this, which was at the moment of writing this thesis not available from any of the cooperatives.

From MT’s point of view, “organic” was quite close to land sharing, with a land use closely related to agroecological principles of nutrient cycles. In this case, the lack of chemicals contributes to restored agrobiodiversity levels which in turn provide ecosystem services not available on a conventional farm due to intensive land use and chemicals killing of bacteria and depleting soil nutrients. This would be a more synergetic approach which is more of a win-win scenario where the farming and nature do not compete for space.

When analysing the impact that FT can have on these land uses, using a GVC perspective, it appears as though it could well be some but that it is hard to effectively demonstrate since it can be very circumstantial. To begin with, given the very different land use practices which can exist amongst members of the same cooperative and the clear differences with regards to FT membership in those cooperatives (ranging from 20% to 100%) it is not very meaningful to use expressions like “FT cooperative”. Second, both CD (who quit being FT-certified to due to the perceived lack of benefits) and CT has more than one certification, making it harder to distinguish the impacts each one can have. Third, with the exception of CT, neither farmers (including MT) nor cooperative representatives expressed any notions that FT had led to any major change in how they conducted their business or used their land. Instead, it would appear as though people who already agree with or live up to the standards and practices are the ones who apply for certification. Furthermore, this seems to be done mostly from a monetary perspective, where the main attraction lies in the minimum price offered, or in case of MT; premiums paid for organic coffee and the access to new markets.
FT could still have an indirect impact in conjunction with the cooperatives, who would seem to be the main actor who FT engages with. Many of the benefits by FT-certification, both as expressed by FT themselves and indicated by previous research, is capacity building programmes which include technological assistance, education, and more. These benefits can also be accessed by non-FT members of the cooperatives and all three of them seemed to have such programmes. Still, few of the Santa Elena farmers expressed such programmes as being an important reason for their membership in CA, and it would also appear that few of them were aware of what FT was.

Another possible venue for FT impact related to the cooperative is as a seller of chemicals to the farmers, which is regulated through the FT-certification and limits the sale to “green labelled” less strong brands. Each cooperative also use “engineers” who can give recommendations on land use. Given the voluntary nature both of these measures and the application to become certified in the first place, the final impact of FT on land use appears to be marginal in relation to the cooperative which seems to be the most important counterpart for the farmer. If FT and the cooperative share goals and visions, this impact further down the value chain could be increased; if not there is little data to support any significant effect.

8. References


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