

Chapter 6

Between Extractivism and Conservation: Tree Plantations, Forest Reserves, and Peasant Territorialities in Los Ríos, Chile



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6.1 Introduction

Throughout the world, economic growth remains dependant on the material expansion of economic processes, which are based on the growing extraction of natural resources in rural areas (Krausmann et al. 2018). Particularly in Latin America, such expansion has created continuous waves of large amounts of resource extraction often aligned with national development goals. This process has been referred as extractivism¹ (Brand et al. 2016; Gudynas 2015). Concurrently nature conservation often follows global and national sustainability goals. Both, extractivism and conservation strategies are mainly territorialized in rural areas, where local – often traditional and smallholder based – modes of living base their livelihoods and territorialities (Escobar 2014).

¹In the definition of Acosta (2013), extractivism consists in “those activities which remove large quantities of natural resources that are not processed (or processed only to a limited degree), especially for export. Extractivism is not limited to minerals or oil. Extractivism is also present in farming, forestry and even fishing” (2013: 62).

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Recently, in view of the socio-environmental crisis in Chile, a ‘green growth’ economy has been instituted as a sustainable way forward (Gobierno de Chile 2013), positioning what might be called a neoliberal thinking applied on sustainability² (Brand and Lang 2015; Lander 2011). In this context ‘green growth’ also masks a framework of institutions and processes that facilitates the extraction of natural resources in specific territories. Tree plantations in Chile show a extractivist structure, since they are mainly based on the expansion of pine and eucalyptus monocultures with the aim to produce wooden raw materials for global markets (Brand et al. 2016; Gudynas 2015). While on the one hand, this goes along with rather short-term private profits for multinational companies, on the other hand, this produces long term societal and environmental costs, locally, nationally, and globally (Clapp, 1995; Donoso et al. 2015, Millaman et al. 2016, Reyes and Nelson 2014). This ‘productive’ approach on sustainability is nowadays complemented by a system of protected areas in Chile, which is a mixture of public and private conservation initiatives seeking to preserve nature, particularly forests (Pauchard and Villarroel 2002). It certainly serves to limit environmental destruction and protects biodiversity but can also be coined as a neoliberal way of grabbing nature, or ‘green grabbing’ (Holmes 2015).

These concerns have triggered discussions about conflicting modes of nature appropriation, which became manifest in different interpretations around ‘sustainability’. At the centre of the debate we find questions like: sustainability of what? – but less frequently – sustainability for whom? This last question is the one that politicizes nature and forces a political ecology of analysing divergent forms of perceiving, valuing, and using nature, i.e., forms of nature appropriation. Nature materializes in concrete ‘local’ places with particular territorial dynamics. Thus, from a theoretical point of view, we approach nature and territory from a relational and ontological angle (Escobar 2014; Leff 2014; Max-Neef 2016), i.e., under the premise that social, economic, cultural, and biophysical aspects are co-founded creating and recreating spaces, but often through tensions and conflicts. We understand territoriality as a way in which specific human groups construct a geographic territory under a complex network of relationships. Territory is thus a political entity, which is disputed by different territorialities that set different ways of appropriating nature (Porto-Gonçalves and Leff 2015). From this viewpoint, sustainability is politicized and constituted through specific and diverse cultural forms of nature appropriation. Nature is disputed among regional, national, or even international actors who seek the extraction of resources for economic reasons or its conservation, and local actors who look for ways of living that allow them to reproduce their particular territorialities.

This chapter aims to question the de-politicized idea of ‘sustainability’ and its materialization in a concrete place, also seeing ‘sustainability’ as a new veil to legitimize the bitter side of economic growth and the territorial transformations caused by it. For that, we analyse one case in which three territorialities overlap with

²For a definition of sustainability see Azkarraga et al. (2011).

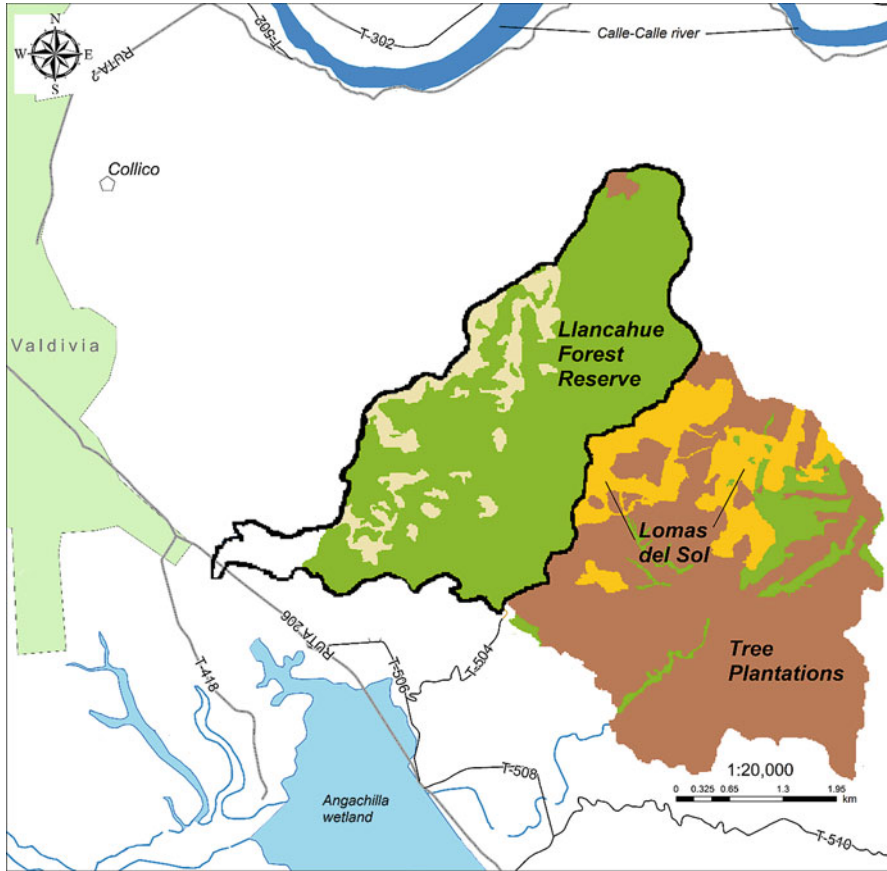


Fig. 6.1 Schematic map of the study area. (Source: own elaboration based on information from UACH 2017)

divergent interests, perceptions, values, uses, and strategies for nature appropriation. We centre our attention on the territoriality of a social peasant group³ who inhabit the sector⁴ Lomas del Sol – LdS –, Municipality of Valdivia, Province of Valdivia, Region of Los Ríos, south-central Chile (see Fig. 6.1). The group consists of

³The use of the concept of ‘community’, as highlighted by Roberto Morales (personal comment to an early version of the paper), can be problematic in this case. We use the broader notion of ‘social group’, which share a common history, productive practices and common way to appropriate nature. Therefore, we opted for the concept of territoriality, which captures the strategies and actions of these shared practices.

⁴‘Sector’ corresponds to a political unit in Chile under the level of the municipality (‘comuna’ in Chilean nomenclature). At this level, local associativity institutions are legally recognized, such as peasant or indigenous associations.

about 24 families, some of them members of the peasant association “*Comité pro Adelanto Lomas del Sol*”. The inhabitants of LdS are one of the many groups throughout south-central Chile whose way of living is trapped between nature extractivism and nature conservation. LdS is, on one side, a biodiversity hotspot and hydrologically important for providing potable water to the city of Valdivia (Donoso et al. 2014). On the other side, LdS lies adjacent to vast pine and eucalyptus tree plantations established by three companies, namely: *Hancock Chilean Plantations* (former *Forestal Tornagaleones* of the consortium MASISA), *Arauco Sur*, and the plantations of the *Fried* family in a medium-size property.

We approached this case study following the idea of ‘strong transdisciplinarity’ (Max-Neef 2005; Nicolescu 1996), which seeks to dilute disciplinary boundaries and the Cartesian divide to recognize the complexity of human-nature interactions, the dialectic of the ‘included third’ by taking into consideration that pure objectivity is never possible, and the different ‘levels of reality’ which recall us that multiple and divergent logics co-exist at the same time and place (on this see chapter by Erlwein et al. in this book). The chapter is based on empirical work from two research projects that were designed under the principles of participatory action research (Fals-Borda 2015).

The first of the projects developed a series of actions between 2014 and 2017 with the local community (see Pacheco and Henríquez 2016a). The other project was based on participatory action research in the area and was conducted between 2016 and 2017, including ethnographic methods such as participatory observation (Guber 2011) and participatory mapping (Sletto et al. 2013; Rister and Ares 2013). We particularly use the information of the mapping exercise of the second project as a pivotal input to understand territorial transformation and complemented it with the multiple interactions with different members of the community, listed in both projects.

After this introduction, the second section of this chapter briefly presents the history of tree plantations in Chile. The third section sketches nature conservation through protected areas in Chile with a particular focus on the Llancahue forest reserve. The fourth section briefs the plantation boom in Valdivia. The fifth section presents the territorial transformation from the viewpoint of the inhabitants of LdS. The sixth section discusses the politicized sustainability embedded in this particular territorial conflict. Finally, the last section concludes that while the sustainability approach of Llancahue clashes with that of the inhabitants of LdS, the underlying reason for the conflict is the expansion of tree plantations.

6.2 Historical Context of the Chilean Tree Plantation Model

The Chilean tree plantation model carries over one century of expansion processes. It consolidated from a state development strategy, through a neoliberal development strategy with a primary role of the private companies and a subsidiary state,

mostly through the promotion of large private pine and eucalyptus plantations. The following is a summary of these processes.

6.2.1 Before the 1970s

The process of nature appropriation in south-central Chile traces back to the Spanish colony and the enclave economy they built in the attempt to control the Mapuche territory.⁵ For over three centuries, the Spanish were never able to fully control these territories. After the so-called ‘pacification of the Araucanía’ in the XIX century,⁶ in which the newly independent Chilean state consolidated its military control over the Mapuche territory, the first Forest Law was introduced in 1872. It sought to regulate the practices of clearing and burning of primary forest, and to encourage the planting of introduced species. However, this law did not have significant real effects. With the beginning of the twentieth century, the model of scientific forestry was introduced in Chile, the first forest management service was created, and a law project to implement incentives for the promotion of tree plantations was presented to congress in 1911, being rejected (Klubock 2014).

In 1931, the second Forest Law came into force, including the spirit of the project rejected decades before. During this time, logging of primary forests and large-scale planting of introduced species increased. In 1920 the *Compañía Manufacturera de Papeles y Cartones* [Papers and Paperboards Manufacturing Company] – CMPC–, the first private industrial forestry company, was established. In 1937, with the creation of the *Corporación de Fomento* [The Chilean Economic Development Agency] – CORFO – Chile articulated an industrialization programme with the forestry industry as a key economic sector. With the agrarian reform of the 1960s, the forestry development model was restructured, and small-scale plantations were promoted through cooperatives (Clapp 1995; Donoso et al. 2015; Klubock 2014).

6.2.2 Implementation of the Neoliberal Model

The military dictatorship (1973–1990) set a partial agrarian counter-reform. The new policies favoured private entrepreneurship, the transfer of public property to private hands, and its concentration in a few economic groups (Gómez 2014). In addition, barriers for international trade were removed (Clapp 1995). Thanks to the

⁵Group of indigenous people in Chile and Argentina. Mapuche in the original language means “people of the earth”.

⁶We propose to call this process “Usurpation of Araucanía”. The process starts with a series of negotiations and finalized with a military campaign covering most of the nineteenth century. Military control of the frontier was gained by the Chilean state in the 1870s.

Decree Law 701 of 1974 – DL 701 – which foresaw subsidies for tree plantations and guaranteed no expropriation – there was a massive expansion of tree plantations in south-central Chile (Clapp 1995; Donoso et al. 2015). Also, other policies, such as the Water Code of 1981, privatized resources and rights. Besides, the period was characterized by systematic violations of human rights, particularly of peasants and indigenous people. In this period, Chilean forestry plantation companies, now in private hands, became transnationals, expanding mainly to other Latin American countries (Gómez 2014).

6.2.3 Return to Democracy

Despite the establishment of social and environmental institutions and the recognition of indigenous communities shortly after the end of the dictatorship, several public organisms created in the period of the dictatorship remained intact. In democracy the tree plantation model, through the before mentioned DL 701, underwent modifications that tried to encourage small-scale plantations, with some achievements, but without substantially changing the dominance of large-scale monoculture plantations.

The government of Chile sought to become part of the Organization for Economic Co-operation and Development – OECD –. For that purpose, a joint study was performed by OECD and the Economic Commission for Latin America and the Caribbean – ECLAC – (OECD & ECLAC, 2005) assessing the economic, social and environmental state of Chile in order to become a member country of the OECD. Based on the reports' recommendations, the Chilean government implemented a series of changes towards a 'green economy'. As part of the restructuration, a Ministry of Environment was created in 2010 and other institutional bodies, such as Environmental Courts, were introduced to promote, evaluate, and monitor the conservation and sustainable use of the environment as well as to impart environmental justice and arbitrate conflicts.

A focus was given to primary forests and tree plantations. For example, the Law on the Promotion of Native Plantations (Native Forest Law), which came into force in 2008 after 16 years of discussion, was introduced with the aim to create a subsidy for sustainable management and recovery (restoration) of native forests, but at the end it became a mechanism to promote monoculture plantations with single native species, with limited public funds. In concert with the global trend, private actors also increasingly engaged in: (i) eco-labelling initiatives such as the Forest Stewardship Council⁷ – FSC –, which is widely used by companies such as

⁷FSC is a global organization dedicated to promoting responsible forest management. In short, their activity engages stakeholders in the process of verification of responsible practices of companies. Companies which decide to comply to the protocols of FSC have to demonstrate certain standards, so their products get an eco-label. With this eco-label, consumers can verify that the companies are following the standards (Heilmayr and Lambin 2016; Millaman et al. 2016).

ARAUCO and MASISA (Heilmayr and Lambin 2016; Millaman et al. 2016); (ii) private conservation reserves, such as Oncol private reserve in Valdivia, owned by ARAUCO (Holmes 2015); and (iii) different approaches to eco-tourism (Klubock 2014).

6.2.4 *The Recent Tree Plantation Model*

The large-scale pine and eucalyptus monocultures stopped being supported by DL 701 in 2012, meaning that plantations established after this year could not apply for the subsidy for a refund of the 75% of the establishment investment (extensive to 90% during some years). The law period came to an end and a new one was not enforced by the Senate of Chile. However, in the meantime, Chile became one of the top 10 countries in the world in terms of land allocated to tree plantations (CONAF 2014). In 2019 the Senate is still discussing to follow with DL 701 for 20 years more, and at present this subsidy is still being given to private companies.

At the end of 2016, tree plantations covered more than 2.4 million hectares in Chile. The main species used were radiata pine (57.6%) and eucalyptus (globulus and nitens) (35.6%) (INFOR 2018). Most plantations in Chile are found in the south-central region mainly in the regions of Biobío (38.5%), Araucanía (20.4%), Maule (17.8%), and Los Ríos (7.7%), i.e. between 37 and 41°S Lat. In Chile, there are three large size companies, 11 medium size companies, 714 medium size owners, and 22,747 small size owners⁸ (INFOR 2018).

Tree plantations are logged to produce mainly sawn wood and pulp. The total production capacity for sawn wood was more than 4.5 ton (eight million m³) and more than 5 ton of pulped wood (Fig. 6.2). The main actors are the three large size companies, which are multinational consortiums with a presence in several Latin American countries (Gómez 2014): ARAUCO S.A., CMPC, and MASISA S.A. Figure 6.2 illustrates the expansion of tree plantations in Chile between 1978 and 2016. The figure also displays the production of sawn wood from 1930 to 2016, and the production of pulp wood from 1975 to 2016.

In this long-term process, as shown in Fig. 6.2, tree plantations started spreading steadily, especially since the dictatorship. Consequentially, the production of wooden raw materials increased. The democratic turn, instead of curbing the expansion of tree plantations even fuelled it. The only major decline (2006–2010) can be explained by decreasing demand due to the global financial crises. In sum, the process left a consolidated model of nature extractivism based on the extensive use of land and tree plantations throughout the country, but most strongly in south-central Chile.

⁸Planted land ownership (x): (i) Large-size company: $x > 30,000$ ha; (ii) Medium-size company: $5000 \text{ ha} < x < 30,000$ ha; (iii) Medium-size owner: $200 \text{ ha} < x < 5000$ ha; and (iv) Small-size owner: $x < 200$ ha

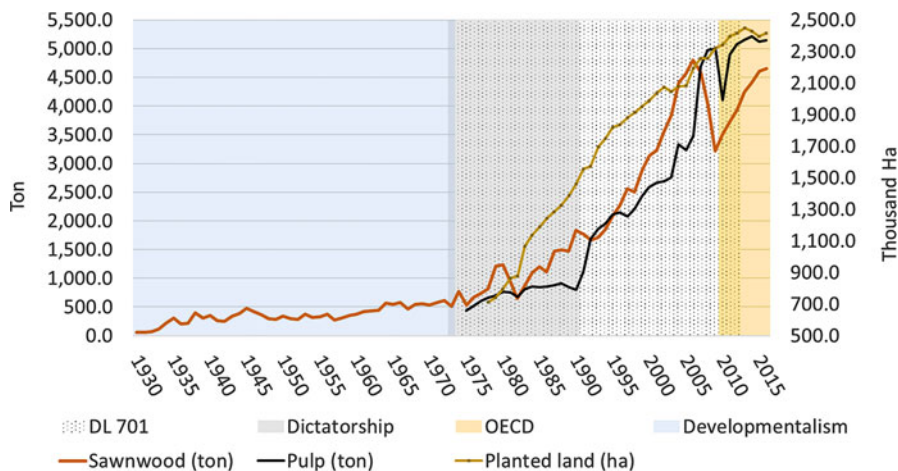


Fig. 6.2 Expansion of tree plantations and forestry industry in Chile. (Source: Own elaboration based on statistics of INFOR (2018). (Note: Growth of national production of sawn wood (ton*) and pulp (ton) are displayed to the left axis. Land used for plantations (ha) in the right axis). Important historic periods are coloured. *Statistics for sawn wood are originally presented in m^3 . We used the conversion factor of the source: $1 m^3 = 0.55 t$)

6.3 Conservation Model of Llancahue: A Turn toward Sustainability?

In Chile, the first protected areas emerged in the early XXth century. They basically had two objectives: to protect the remaining primary forests from rampant deforestation and to exercise control of the political borders shared with Argentina (Klubock 2014; Otero 2006). The first ‘Forest Reserves’ were thought as reservoirs of exploitable woods. In the 1970s and 1980s, a second wave of protected areas emerged based on the concept of ‘wilderness’. In 1984, the National Public System of Protected Areas (SNASPE, acronym in Spanish) was established with four categories: (i) Virgin Region Reserves, (ii) National Parks, (iii) Natural Monuments, and (iv) National Reserves (Pauchard and Villarroel 2002). Since 2003, properties owned by the fiscal governmental unit, the Ministry of National Property [*Ministerio de Bienes Nacionales*], can enter the SNASPE.

The forest reserve of Llancahue is a ‘fiscal property’ and gained the status of ‘Protected National Good’ in 2005 (Ministry of National Property 2006). It is a public property of 1270 ha, owned by the government since 1929, located 2 km south-east to the city of Valdivia in the Region of Los Ríos, south-central Chile. The purpose of the reserve is to protect the hydrological basin that provides water for the city of Valdivia, to conserve biodiversity, and to prevent deforestation and forest degradation (Moorman et al. 2013a). The hydrographic basin of this forest ecosystem supplies nearly 80% of the water for the city of Valdivia. Besides, the Ministry of the Environment selected Llancahue forest as one of the 40 high priority

areas for the conservation of natural ecosystems within the regions of Los Ríos and Los Lagos (Farías et al. 2004).

The Llancahue forest reserve contains one of the last reserves of primary forest (approximately 700 ha of old-growth stands) plus secondary forests of different types (Donoso et al. 2014). The geomorphology of the Llancahue forest reserve consists of moderate hills between 181 and 424 m a.s.l. with gentle slopes (<30%) except near the river basins. According to the Koeppen classification, the climate is temperate rainy warm with Mediterranean influence. The annual average rainfall is 2357 mm, with July being the rainiest month and February the driest (Núñez et al. 2006). The average temperature is 12.0 °C, with January being the warmest month with 17.0 °C and July being the coldest with 7.6 °C (Donoso et al. 2014).

In 2008, the Universidad Austral de Chile – UACH – in Valdivia received a concession for the Llancahue forest reserve free of charge by the Ministry of National Property (2008) for a period of 20 years to implement a sustainable forest and watershed management project together with local communities (UACH 2017). The goals of the project included forest management especially in some areas covered with secondary forests, “to promote old-growth conditions through the use of ecological or restoration thinnings while working with the local community” (Moorman et al. 2013a). Since then, the UACH initiated a process with the aim of conserving the primary forest and ensuring a balanced water supply while meeting the needs of people living in the surroundings (Donoso et al. 2014; Moorman et al. 2013a, b).

The Llancahue forest reserve is located next to a small scattered hamlet of 24 peasant families in the sector of Lomas del Sol. These families’ livelihoods depend on tree logging in their own small forest plots and in the forest reserve, which they have used for decades without regulations and after 2008 under the rules of the management plan of the Llancahue project. The wood is used for traditional charcoal production, which provides the main income to the community. Besides, their livelihoods depend on smallholder farming and, since recent times, on tourism (Pacheco and Henríquez 2016a). A co-management sustainability plan was designed with the participation of members of LdS. Other organizations such as the NGO ‘Agrupación de Ingenieros Forestales por el Bosque Nativo’ – AIFBN – and several public agencies were involved in a committee for the Management of Llancahue.

The plan of UACH proposed a sustainable use of the Llancahue forest reserve based on the concept of co-management, an approach founded on a rather technical vision of sustainability. The initial co-management conservation model employed people from LdS as loggers to do the thinnings in the 317 ha of secondary forests within the reserve. Each worker received a wage plus a share of the extracted timber, following estimations on the willingness to accept (Moorman et al. 2013a). The estimations suggested loggers from LdS would accept a salary of \$346/month USD (\$ 200,000 CLP). The authors also performed an evaluation which signalled that people in LdS expected mainly employment as a benefit from the Llancahue project.

However, the study also estimated that the project could pay only a maximum of nine workers for 3 months a year. Between 2009 and 2016 the co-management plan was applied for the Llancahue forest reserve. Table 6.1 shows some statistics. The

Table 6.1 Features the Llancahue forestry co-management plan

	2009	2010	2011	2012	2013	2014	2015	2016
Area under management (ha)	11	10	9	12	7	12	14	9
Wood extraction (mt)	1700	1200	270	1500	920	2400	1430	1320
Wood for UACH	1600	1100	180	1400	800	40	n.d.	610
Wood for loggers of LdS	100	100	90	100	120	n.d.	300	710
Local workers (number)	6	6	6	6	6	9	9	9
Wages (CLP/mt)	4000	4500	5000	5000	6000	6000	7000	6000
Total annual wages [II*VI] (1000 CLP)	6800	5400	1350	7500	5520	14,400	10,010	7920
Average annual wage per worker (1000 CLP)	1133	900	225	1250	920	1600	1112	880

Source: Pablo Donoso (in Pacheco and Henríquez 2016a)

Units: *CLP* Chilean Peso, *mt* meter

area under management reached its maximum in 2015, when 14 ha were managed. The average annual wage per worker oscillated between \$225 CPL and \$1600 CPL, and the amount of wood per worker per year was between 15 and 79 m³ of firewood (1 m³ of firewood approximately 0.66 m³ of solid wood).

The co-management plan was not without criticism. The initial approach sought to present the Llancahue forest reserve “as a demonstration conservation project where public primary forests are managed sustainably and consistent with the needs of local communities” (Moorman et al. 2013a). However, while the programme was successful in reaching the first goal, i.e. to manage the native forest without degrading it, the second goal was not met: the model is not consistent with the needs of the local community. The main reason behind this is that the project cannot deliver what people in LdS expected from it, mainly employment. Highly seasonal working opportunities for 9 individuals in 24 households can certainly not deemed to be sufficient. The second issue is that other needs, such as education, were not taken into account. Finally, a more fundamental problem is that the notion of ‘participation’ did not reach decision-making, therefore, is not ‘co-management’ but rather participatory management.

Although the plan recognizes that “a major challenge in community based approaches is determining how to engage local community participation”, the people of LdS is considered a threat for conservation per se: “they [protected areas] are threatened by illegal uses by neighbouring communities such as illegal timber harvesting and grazing of animals . . . The adaptive co-management model in Llancahue has recognized the need to work with the campesinos (. . .) in the neighbouring community who were illegally logging the forests in the watershed” (Donoso et al. 2014).

How to use and manage the forest are in fact an interplay of bundles of rights. UACH is the manager and not the owner of the Llancahue forest reserve. There is no binding obligation for UACH as the acting authority to include LdS needs into

the decision-making, beyond an advisory role. However, this stands in contrast with the needs and rights to autonomously determine a mode of living of the people of LdS, jointly with the historical marginalization of basic elements of well-being such as health or education (Pacheco and Henríquez 2016a). In this sense, the obligation scales up to the state, which through the Ministry of National Property provided the concession of Llancahue expecting its conservation but without any consideration for the interplay with the surrounding uses of property, neither the community nor the plantations.

UACH recognized these major shortcomings and widened the cooperation approach with the social group since 2014. The pure work-based strategy was complemented with community based eco-tourism (Pacheco and Henríquez 2016a) that was inspired by participatory action to improve the local conditions by means of constituting strategies of eco-socio-development (Henríquez et al. 2010, 2018; Sampaio 2005). However, the pivotal role of the sustainability approach remains on the forestry management.

We see the main shortcomings in the limited understanding of the relations between people living around the reserve, their interests, their rights, and their relationship with the forest and the adjacent tree plantations. Instead of pointing at LdS group as ‘the threat’ for Llancahue’s forest, a more in-depth analysis of the territorial processes must be done to understand local needs, dependencies, and forest uses in relation to tree plantations. We find three types of actors in conflict about the management of this territory: Forest companies, local community of LdS (some of the families are dedicated to illegal logging, or in activities related to forest production), and the University as a manager of Llancahue Reserve.

6.4 The Plantations Boom in Valdivia

In 2016, the region of Los Ríos had 185.108 ha of eucalyptus and pine plantations, and the municipality of Valdivia alone had 22.933,6 ha (INFOR 2018). An early industry in Valdivia, mainly the CMPC cellulose plant and INFODEMA, a local plywood company, had operations since 1942. MASISA, one of the three biggest forestry companies in Chile, was funded in Valdivia in 1960, opening the plant in the city in 1965 and creating its logging filial, *Forestal Tornagaleones*, in 1967. However, the plantation boom in Los Ríos and in particular in Valdivia, started in the 1970s and accelerated since the 1990s. The dynamism of the industry in Valdivia received another push with the inauguration of the cellulose plant in San José de la Mariquina in 2004.

The first tree plantations in the area of Llancahue appeared in the 1980s. Until 2013, they heavily expanded conforming an extractivist matrix (Fig. 6.3c). Figure 6.3 displays the land use in the area of Llancahue for the years 1960, 1980, and 2013. Between 1960 and 1980, while native forests increased within the borders of the Llancahue forest reserve, they decreased outside the reserve. Between 1980 and

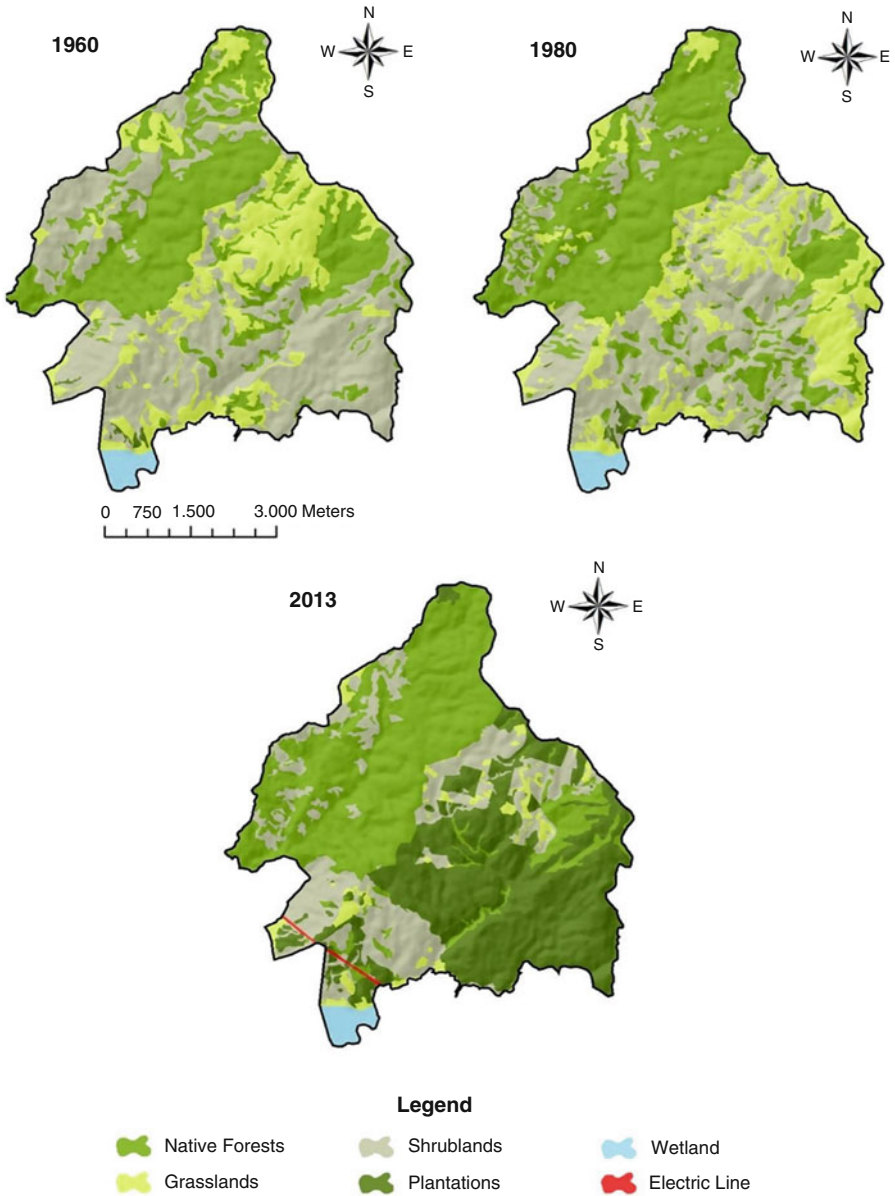


Fig. 6.3 Changes in land use in Llancahue area between 1960 and 2013. (Source: Medel (2013) in UACH 2017)

2013, there was a growth of native forests within the reserve, while tree plantations replaced both native forests and private agricultural land outside the margins of Llancahue.

6.5 Living Between the Llancahue Reserve and Tree Plantations

The peasant group in LdS consists of 24 families, some of which are grouped under the peasant association without lucrative purpose *Comité pro Adelanto Lomas del Sol*, established in 1997 and legally recognized as a decentralized local social organization by the municipality of Valdivia. LdS is located in the buffer zone of the Llancahue forest reserve, but also besides blocks of tree plantations (see Fig. 6.1). This makes it an interesting case to reflect the territorial transformation of a social group that is trapped in between extractivism and conservation. The main source of income is firewood and coal production, sold mainly in Valdivia, complemented by small-scale farming. People have orchards and greenhouses, and raise livestock such as pigs, sheep, and cattle. The formal education is mostly low, not exceeding 8 years of schooling. Basic infrastructure is lacking or scarce. There is no health service and no potable water, which is ironic as the area provides the water for the whole city of Valdivia. Generally, there are no job opportunities in LdS, especially for women and young people, or for men who wish to work outside forestry or agriculture. Some families migrated to urban centres, mainly Valdivia (Pacheco and Henríquez 2016b).

The management of forest conservation controlled the illegal logging, but on the other side, it reduced the working opportunities for local families dedicated to produce charcoal and firewood. The tree plantations expansion made pressure over property of local families, resulting in some of them are selling their properties to forest companies. LdS is located between the conservation and the forest extractivism. Even if LdS social group could make illegal practice and harmful for conservation, the effects of this practice are less harmful than the impacts of the industrial model of plantations in all water basins of Llancahue.

To understand the loss of the territoriality of the peasant group of LdS in the interplay with the territorialities of the conservation scheme and the tree plantation blocks these two, it is necessary to start from the local notion of territory. In the following we show our empirical findings gathered with a mixed method approach involving focus group discussions and a participatory mapping, conducted together with residents of LdS and complemented by observations in several local activities. Focus groups were used to reconstruct the preponderant territorial dynamics in three historical periods: (i) 1970–1990, (ii) 1990–2010, and (iii) 2010–2016. However, the exercise included questions to contextualize the time frame before 1970. The group division was made by age. The exercise revolved around the construction (and later analysis) of maps. The exercises provided a synthesis of the main elements of

territorial transformation, which ultimately inform on the local (externalized) costs of tree plantations in a qualitative way.

6.5.1 Territorial Context Before 1970

The first Chilean settlers, the families with surnames Hernández and Noches, arrived in the Llancahue area between 1915 and 1930, in a process of late agrarian frontier expansion. At first, only male settlers arrived and began the land occupation as squatters, ‘opening’ land for agriculture. Later on, they brought their wives and children. These first families were followed by others, starting a local economy based on the extraction of wood from native species to establish their homesteads, as firewood, and mainly as the raw material for charcoal production. Charcoal was produced with artisanal coal furnaces, a technology used all over south-central Chile. The coal was transported with carts and yokes of oxen to Valdivia and Collico for sale, often constituting the only source of monetary income. The trip took more than a day with a one-way transportation time of around 5 h. In the 1960s, the population of the sector LdS had grown enough to justify the construction of a school, which operated between 1960 and 1972 and constituted the first permanent state agency in LdS. In 1974, as a *comunero*⁹ mentions, there were enough inhabitants to “play football”.

The physical accessibility to LdS was difficult, since the bridle paths up the hill were precarious from the surrounding towns. Even the road from Valdivia to LdS was rudimentary until it was paved in 2009, when a gravel carpet was added to the road. In total, until that year, LdS was quite isolated, despite the very close proximity to the city of Valdivia.

Land property of peasants in LdS was not formally titled until a private property law recognized them as owners in 1974. Until this point, the families lived as squatters between the public property of the forest reserve and large private properties.¹⁰ Until the late 1970s there were no pine or eucalyptus plantations in the area, and, as stressed by the older interviewees, water was abundant.

6.5.2 Period 1970–1990

During the 1970s, the orchards in LdS were still mainly for subsistence and forests products were used for day to day life. Multiple species of fungi from the forest,

⁹An individual of a community.

¹⁰However, as reported by Donoso et al. (2014), even in the present several of the families do not have formal titles.

such as ‘Loyo’ and ‘Digüeñe’,¹¹ for example, were common in diet. In agriculture, as one of the focus group participants commented, “each household needed to sow in order to sustain itself”, and “there was not much potato left for sale”, pointing to the lack of yield surplus. Income was mainly derived from the production of charcoal using timber from the surrounding primary forests.

Although in 1974 land property of peasants in LdS was formally titled, peasants were not allowed to sell their land until 1979. In 1979, forestry companies began to buy land from peasants in LdS. The participants of our focus group discussions did not recall the year in which the first forest plantation was established in the area. But they know that logging companies purchased the first land in 1979. This was followed by several deals at the beginning of the 1980s.

Large-scale tree plantations grew during the 1980s, while several peasants in LdS established small-scale tree plantations on their plots to sustain their firewood availability. The reasons behind were the degradation of the primary forests on their own plots and the clearcutting of the primary forests on the holdings of the plantation companies. The participants of our focus group discussions associated the land purchases by plantation companies to migration of peasants from LdS to cities, mainly to Valdivia. They remembered a purchase of 42 ha of land in 1989 for a price of \$CLP 2.5 million, meaning approximately \$ CLP 59,000 per ha. Other reasons included the lack of job opportunities and difficulties to access basic education, as the primary school was closed in 1972, forcing children to assist to a boarding school in Huellehue, a town 6 km away from the sector, 2 h walking through the tree plantations.

Figure 6.3 shows that the degradation of the native primary forest in the area of the Llancahue forest reserve was greater in 1960 than in 1980 when the plantations were beginning to arrive. This suggests that the families in LdS had slowly overused the forest up to this point (1960). However, the combination of the advance of the tree plantations on the one side, and the establishment of stronger norms of forest conservation on the other, gradually led to a crisis of the way of life of the LdS community and ultimately to the loss of their livelihoods.

Focus group participants point out a migration from ‘below’, the sector of Piedras Blancas, ‘upwards’ to the sector of LdS (see magenta arrow in the middle of Fig. 6.4). In addition, a block of native forest outside the Llancahue forest reserve is clearly identified (green area), which can also be seen in the land cover maps (Fig. 6.3). The map also displays coal kilns in almost every household, the abundance of charcoal, and Valdivia as the main coal destination (purple arrows). Two more elements were revealed by the exercise. First, there was a church in LdS. Second, the symbol used for flora and fauna is not only placed at the native forest which corresponds to the Llancahue reserve, but also at their individually owned land, signalling that there were native forests on their plots. One of the main elements of the territorial transformation during 1970 and 1990 is the first tree plantation block, located between LdS and the river Calle-Calle (brown box

¹¹For a description of Chilean fungus see Furci (2008).

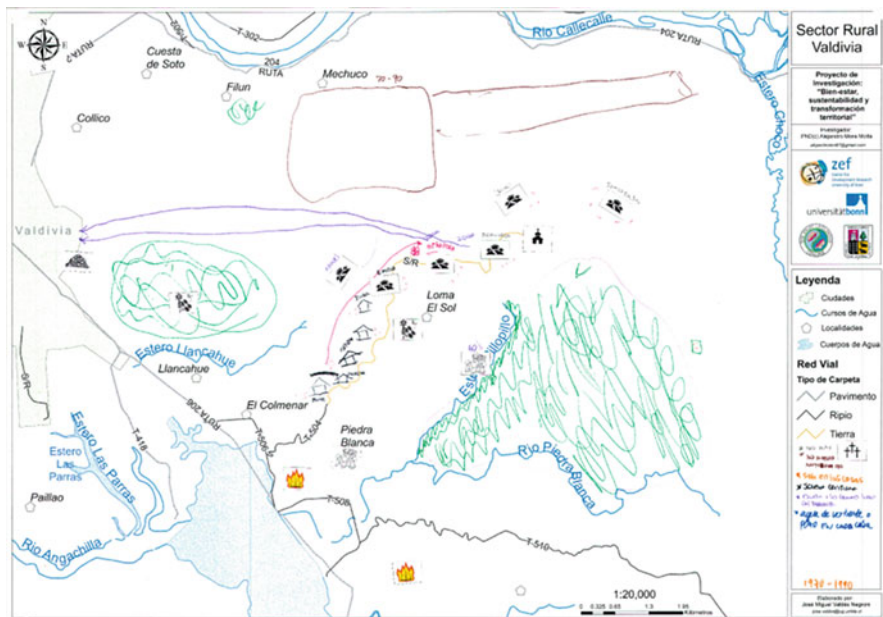


Fig. 6.4 Elements of territorial transformation during 1970–1990. (Source: first author, participatory mapping workshop, Lomas del Sol, Valdivia, December 2016)

and rectangle). This is the tree plantation of the *Fundo Fried*, a land owned by the individual of the same surname, which is still present today.

One interesting event came out in one of the focus group discussions. The abundant native forest near the Pillpillo creek was being occupied by members of the community. They remember they and their parents used to extract timber and other forest products such as local fungi from this forest. In the 1980s, an official of the state visited the place started a legal process claiming that it was a public land. Finally, the land was recognized as public, so the families had to move away. The land, however, was sold to MASISA and the forest, they remember, was transformed into plantations.

6.5.3 Period 1990–2010

Between 1990 and 2010, tree plantations spread on the hills next to LdS. Plantation companies introduced socio-ecologically doubtful agronomic practices, such as aerial application of agrochemicals, which were dispersed by air currents falling over the orchards in LdS and the surrounding primary forests. As one of the participants reported “In the eighties and nineties . . . we lived near the Pillpillo creek, and the forestry company used [aerial] fumigation. Near my house we had

a small orchard . . . and all the chickpeas were ruined, all was burned”; the reason was that in that time “plantations were just starting to grow, and they had to fumigate due to a small animal that the pine had”. “Yes, fumigations where due to a worm supposedly”, complemented another participant. Practices were banned later on.¹²

Plantation companies often highlight their important role in creating jobs. However, the operations around LdS did not offer much working opportunities for local people. The jobs that were created required a level of qualification which most community members did not have. In addition, the number of newly created jobs was very limited, as the processes were highly technical, with intensive use of machinery.

Between 1990 and 2010, the importance of charcoal production increased while subsistence agriculture decreased in LdS. This was associated with an intensified migration, in which between seven and ten families left the sector. However, some of the young members got qualified jobs, mainly in Valdivia, and even positions within the forestry industry but away from the sector. This was the case of the son of one participant, who gained a position as a truck driver for ARAUCO. His job was to transport logs from all logging sites through Los Ríos and Los Lagos to the cellulose plant in San José de la Mariquina (50 km north of Valdivia).

Our interviewees perceived an important change during this period. They started noticing that water was becoming scarce. Water is crucial for agriculture and forestry, and especially given the fact that LdS was not connected to a pipe water system, the water shortages started creating massive problems, mainly during summer. One of the participants declared: “there has been moderate water scarcity, almost at each slope. Before we had rain 15 days on a raw during winter, now it rains only for two days” as a result, the dependence on income from jobs outside agriculture and forestry grew.

Since 2005, new infrastructure came to LdS in the form of brick kilns and a local water system (not connected to the aqueduct which provides water for Valdivia). This is associated with the arrival of two new actors, namely: (i) the NGO AIFBN, which developed a program related to the establishment of the water system, and (ii) UACH, which took the management concession of the forest reserve.

Figure 6.5 shows the territorial transformations between 1990 and 2010. The most important element highlighted by the informants is that the area got surrounded by tree plantations (brown area). The plantations of the company *Forestal Tornagaleones* (now Chilean Hancock Plantations) now joined *Forestal Fried* and created a continuous block of tree plantations around LdS. The place where plantations are shown in Fig. 6.5 was still occupied with native forests in 1990 (Fig. 6.4). When we compare this with Fig. 6.3, it becomes evident that the advancement of the tree plantations led to the deforestation in that area. However, our informants perceived the deforestation during that time as being larger as it actually was, as it is evident when contrasting the land use changes of Fig. 6.3 and the change in the perceived

¹²These practices were only banned in the municipality of Osorno (Ministry of Health 2000). However, it might have been a corporate decision which changed practices.

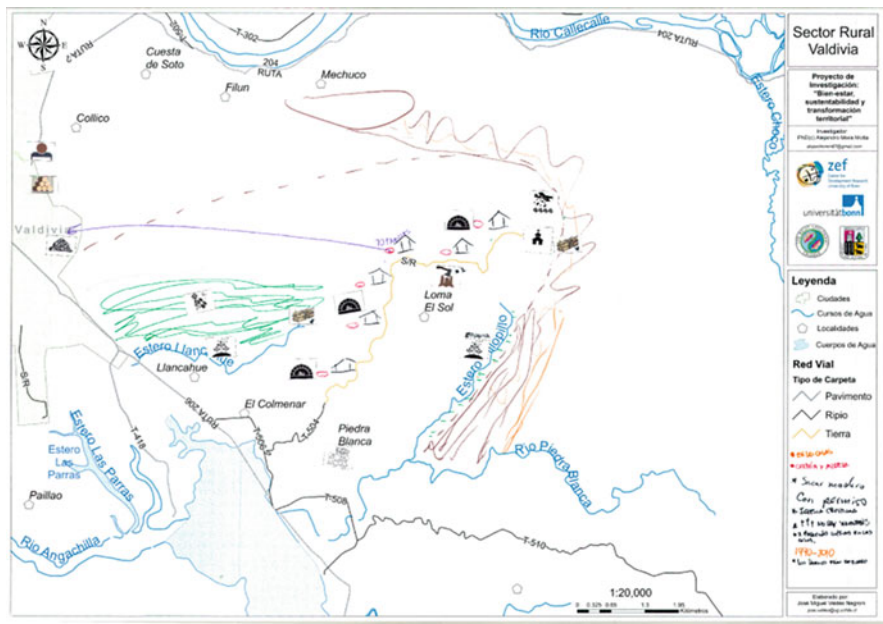


Fig. 6.5 Elements of territorial transformation during 1990–2010. (Source: first author, participatory mapping workshop, Lomas del Sol, Valdivia, December 2016)

native forest beside the Pilopillo creek (Estero Pilopillo) in Figs. 6.4 and 6.5. One possible explanation might be the high economic and cultural value the participants attached to the native forest that was replaced by plantations.

6.5.4 Period 2010–2016

The year 2010 brought a fundamental change for the inhabitants of LdS: the dirt road became a gravel road, and parts of it were asphalted shortening the transport time to Valdivia to 30 min by car. Some families bought pick-ups in order to transport firewood or charcoal to Valdivia, now being able to do two or even three journeys per day. The improved road also spurred a community-based ecotourism project, started by UACH. The project introduced a change in perspective regarding the ‘participation’ of people of LdS. While previously their involvement was mainly needed as loggers in few selected areas of the reserve, with the community-based eco-tourism¹³ the strategy changed by implementing a co-design process for the

¹³Community-based tourism (CBT) is a tool for communities to achieve defend their territories from threats such as real estate speculation and cultural de-characterization. With this tourism it

selection of desired economic activities and actions pointing towards them. Eco-tourism trails were built up within the Llancahue forest reserve and signals with local stories and biological history facts were introduced. UACH staff trained five inhabitants of LdS as ecotourism tour guides. Also, other projects were encouraged. One of these was a pilot project for photovoltaic solar energy designed by Debus et al. (2017), which included the installation of solar panels at the LdS community meeting house in a series of collaborative workshops. This project shows to one of the problems of LdS. LdS is close to the regional capital city of Valdivia but is not connected to the electric network. Families mainly rely on fuel-based power generators.

However, at this point, as is evident in Fig. 6.6, the tree plantations already surrounded the entire sector of LdS, spatially trapping the peasant community between the Llancahue forest reserve and the tree plantations. According to our informants, the Chilean forestry consortium MASISA, one of Latin America’s largest wood panel manufacturers, is the owner of most of the tree plantations around LdS (although recently MASISA sold these lands to Hancock Chilean Plantations). By then, the community seemed to have a conflict with MASISA

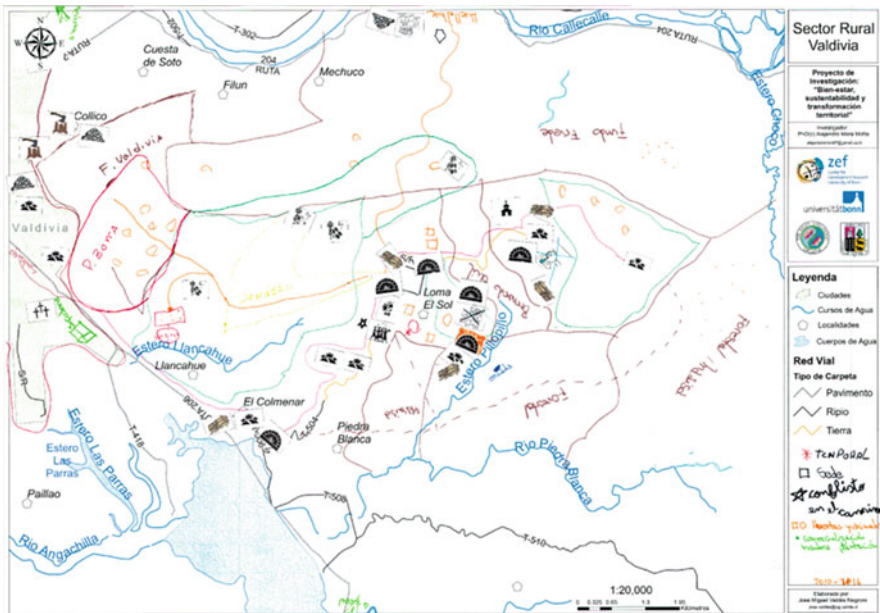


Fig. 6.6 Elements of territorial transformations during 2010–2016. (Source: first author, participatory mapping workshop, Lomas del Sol, Valdivia, December 2016)

has been possible, the generation of work and income, protect biodiversity and cultural identity, conserving ways of life of rural and indigenous communities (Pacheco and Henríquez 2016a).

authorities about the use of the public road. People complained that the company, which normally uses its own roads within its properties, started using the only communal road to transport the logs. Families in LdS were not only affected by the noise and the dust, but also because the road was gradually destroyed by the heavy trucks. One day they decided to block the road. Once they did it, MASISA stopped sending its truck through the public road. According to Vásquez (2014), the NGO AIFBN made a formal complaint to Forest Stewardship Council – FSC –, since MASISA possessed the eco-label certification of this global organization. Due to the conflict with the community they deemed it to be no more justified.

With the advancement of tree plantations, the shortage of water increased. As one of the members of LdS mentioned: “Before [1970] in the creeks the stream flow had more water than now, that’s the difference, the wells were completely filled”.

During the time of the research, the coal prices were relatively low, and the efforts in time and work involved in the process of coal making almost did not offer added value. For these reasons, the use and dependence on firewood increased. Peasants tend to cut down the last remnants of native forest on their plots. According to one of the young participants, the weekly production of coal of the own plot of his father is around 15 sacks of coal, but the effort of doing the coal is so high and badly paid that they were considering leaving only the firewood. Two other participants mention that, on average, they produce 40 sacks of charcoal, a lower estimate. The price at which they sell in Valdivia was between \$ CLP 4000 and \$ CLP 5000 per sack, but the commercial price in the city for final consumers is between \$ CLP 8000 and \$ CLP 9000. Also, the participant reported that there is no real differential prize for the type of wood between pine or native species, since the consumers do not have the knowledge to differentiate. When selling the firewood in Valdivia, the prices for the 1 m³ of firewood are around \$ CLP 22,000 for eucalyptus and between \$ CLP 26,000 and \$ CLP 30,000 for native species and pine. The main difference in costs is that the coal requires one-week production time at the kilns, thus making the firewood more appealing.

In reflect which are the most fundamental changes from 1970 to the present (2016) the participants of the focus group highlighted that for the community, the infrastructure, including the road and the new kilns make a difference. However, the most important change perceived was the process in which people of the sector decided to leave and sold their land to the logging companies. One of the participants recognized that it was not a forced process, but rather “because due to their needs, people did not value their assets”. Regarding the prices, the participant reflected that while in the 1980s 1 ha of land was worth \$ CLP 40,000 to \$ CLP 50,000, one charcoal sack was worth \$ CLP 300, and one lunch in Valdivia was \$ CLP 500, in 2016 1 ha of land was worth \$ CLP ten million, one charcoal sack was worth \$ CLP 5000, and one lunch in Valdivia was \$ CLP 4000. This reflection offers a rough estimate of how land valorisation has taken place, having very low prizes when the land deals from the smallholders to the companies happened.

6.6 Towards a Social Model for Sustainability?

We explored three forms of nature appropriation and their interactions in our particular case. First, the Llancahue forest reserve is a public conservation area of 1270 ha managed by UACH under a ‘sustainable co-management’ plan (Donoso et al. 2014; Moorman et al. 2013a, b) that seeks to protect the watershed hydrological cycle and biodiversity while involving the community of LdS. Second, large monoculture tree plantations owned by logging companies (big and small ones), that use the land to generate their (short-term) benefits while contributing to ‘green growth’, ascribing to the ‘sustainability’ seal offered by self-imposed eco-labelling companies, mainly FSC (Heilmayr and Lambin 2016; Millaman et al. 2016; Reyes and Nelson 2014). Finally, the territoriality of the peasant community of LdS, which appropriates nature in a far less extractive manner than the plantation companies but depends on resources from the native forests. Viewed in perspective, the interplay of these three forms of nature appropriation shows a process in which tree plantations slowly cornered the LdS community against the Llancahue forest reserve.

With the expansion of tree plantations, starting from 1979, the peasant community in LdS gradually lost its cohesion and became more and more dependent on timber extraction from the Llancahue reserve. Companies, in general, do not allow external individuals to harvest their plantations. However, when people have accessed few trees, the companies have not raised concerns. Yet, issues with logging companies are avoided, as one of the LdS members stated: “we don’t want to have any problem with the forestry companies”. However, another participant stated that the logging companies sometimes give a formal letter allowing them to use the remaining after harvest residuals. Besides, several members of the community introduced pine or eucalyptus in their smallholdings.

The population of Valdivia, a city with over 150,000 inhabitants, depends on water supply from the Llancahue reserve. Scaling up, national and international interests see the Valdivian forests as biodiversity hotspots, being Llancahue one among the few relatively well conserved forests. However, for the local community, native forests represent a traditional source of timber for firewood and artisanal charcoal production, which constitutes its main source of income. In 2008, UACH received a concession for Llancahue reserve for a period of 20 years to implement a sustainable forest and watershed co-management plan. With this plan, UACH assumed the role of authority and imposed restrictions on the uses of Llancahue forest in order to conserve the old-growth stands and the hydrological cycle. However, the forest was previously perceived by the peasant community in LdS as a ‘common’ good, a free-access space where no withdrawal rights. Fuelled by a lack of job and income opportunities, this triggered tensions between the territoriality of the community versus the co-management plan introduced by UACH.

The main problem lies in that model of ‘sustainability’ in which co-management has not been able to adequately assume the historical territorial transformation processes in which the community gradually became more and more dependent on a forest reserve, even though it does legally not have the right for wood extraction

(while the adjacent tree plantation owners and timber companies do have it). Therefore, when prohibiting or regulating the extraction of wood from within the forest reserve, the unwanted outcome is to limit the main source of income for the local community. This would not be so problematic if peasants had alternative means to cover their daily expenses. The orchard system, for example, which was traditionally important for subsistence, has however also been weakened since plots were sold due to the plantation expansion.

Despite investments derived from projects (e.g. infrastructure) the sustainability approach offered by UACH has limitations: it can guarantee the protection of the watershed and forest biodiversity, but not the relationship that the community of LdS held with that same nature. In fact, it negatively effects the way of life of the LdS peasant community in general, although there are increasing job opportunities for some. Nevertheless, the underlying cause is often overlooked or ignored: the large-scale expansion of tree plantations into native forests and smallholdings, with full support of the Chilean state.

Locally, the recent economic problems of the inhabitants of LdS seem to be more related to the conservation model than to the plantation model. However, looking at the broader territorial and historical picture we have presented, it becomes clear that the progressive spreading of tree plantations gradually led the community to depend almost exclusively on the exploitation of the native forest in a reserve since many other forests were clear-cut for plantation development. This was precisely the case of the native forest surrounding the Pillo Pillo Creek, from which families used to extract wood and other forest products. The satisfaction of needs became more and more dependent on monetary income, particularly from the extraction of wood from the reserve. Thus, it is inevitable that conflicts arise when restrictions are established and implemented on the use of Llancahue forest reserve, because LdS group did not develop economic association, productive cooperation, or other strategies to diversify the local economy. Their isolation and low educational levels played a negative role for local development, unlike in other rural territories of southern Chile.

The 'sustainability' idea embedded in a 'green growth' concept to which logging companies tend to refer is a euphemism at the local scene. Logging companies do not necessarily engage in illegal activities, but rather in unethical ones. The community has mainly interacted with *Forestal Tornagaleones*, of the MASISA consortium (now HCP). While the company has 'collaborated' with the donation of 0.5 ha to the project to create a space for environmental education (Vásquez 2014), they have used their economic and bargaining power to green wash their activities by complying to FSC. The problem that emerges with logging companies, is that the only way to modify their actions, in a sensitive scale, is by changing the legal framework they rely upon. Within their property, they could deforest native forests and replace them with plantations in the past, only mediated by the management plan, which required an official permission. This was the case with the native forest present outside the reserve, acquired by logging companies and transformed into plantations.

A ‘social sustainability’ approach must start by understanding the relationships between fundamental human needs (Max-Neef et al. 1991) of local people and ‘their’ territory. At stake is the reproduction of the peasant territoriality in LdS. The notion of sustainability proposed by the co-management approach of UACH at Llancahue involves a wider preoccupation by the local peasant group but is not yet able to construct a ‘sustainability’ for that group. Then, how is it possible to build a social sustainability that considers the satisfaction of the fundamental human needs of the peasant families of LdS? It seems impossible to reverse the territorial transformation that was triggered, ultimately by the tree plantation expansion. However, alternatives that allow new territorialities where communities satisfy their fundamental human needs are possible.

The sustainability problem for the people at LdS, and social groups alike, starts by a process of regenerating meaningful opportunities which allow to build territorial processes for the satisfaction of needs. It cannot be solved with a single policy implementation. As the sustainability preoccupations are multi-scale, measures to create such meaningful opportunities should also include multiscale changes. We presented the problem of tree plantations as an extractivist phenomenon, which is focused on the extraction of raw materials for exports. In this regard, the problem relies on the obsession of an ever-growing economy and the set of regulations which support such extraction. Therefore, measures which actually can generate changes at the national level rely on changes on the indicators of progress (Azkarraga et al. 2011). However, this the type of policies suggested in this direction are contrary to those of green growth.

This type of measure must be echoed with some sort of territorial action which balances the negative effects of monocultures. There is an interesting approach of territorial use based on the PROT, and taken as . . . What we perceive is that the state is still subsidiary to the companies’ extractive decisions. It is important that the state engage in a more direct regulation, using tools such as local taxes, which would allow the municipality income out of the land dedicated to plantations. However, while taxes may regulate decisions, stronger restrictions should apply in the neighbouring areas to forest reserves.

Finally, to benefit local actors who have been systematically excluded from the state, as has been historically the case of LdS community, requires a stronger state engagement. Solving structural inequalities is not an exclusive responsibility of a conservation management programme, but also of the state action. While the state has been present in the case of LdS funding the construction of the road, their engagement needs to be enhanced in talking multiple inequalities at the same time.

6.7 Conclusions

In this chapter, we presented a case in which differing perceptions, values, and uses of nature structured tensions and often conflicts around its appropriation. The interplay of the interests that set the territorialisation of these differing views of

nature fostered a territorial transformation. Three territorialities interacted in such process: (i) The tree plantation model under which nature is appropriated in an extractivist manner, legitimized with the 'green growth' discourse and policies; (ii) the Llancahue forest reserve under which nature is protected, with a focus on watershed and biodiversity conservation; and (iii) the territoriality of a peasant community which uses nature mainly for firewood and charcoal production and small-scale agriculture. The peasant community is geographically located right between the tree plantations and the Llancahue forest reserve. Nevertheless, the local problems are complex, since some local residents and external agents have been involved in illegal native wood extraction from Llancahue and other near properties.

Logging companies started the massive expansion of tree plantations in the area in the 1980s, promoted by the Chilean state. In LdS, and many other parts of Chile, plots from peasant families were sold to logging companies, which established plantations with fast growing pine and eucalyptus to produce timber primarily for sawn wood and cellulose production, mainly for export. This export-focused activity is at the centre of the extractivist processes that are present in all Latin America (Gudynas 2015).

The Llancahue reserve, north to LdS, is a public property that became a forest reserve in 2005 mainly for watershed and biodiversity conservation. The LdS peasant community had however perceived it as a free-access common and used the forest for timber, firewood, and coal production without permission for decades. In 2008 UACH, was given a concession for Llancahue reserve for 20 years. Since then, the university implemented a sustainable management plan, with the attempt to build a co-management plan with LdS people but without participation beyond seasonally working relations in logging. The plan limited the use of the woods from Llancahue reserve. In 2014, the plan was revised and involved other actions, such as the development of a community-based ecotourism programme and a photovoltaic energy project.

The peasant group of LdS that exercised a territoriality based on smallholder agriculture and the use of resources from the surrounding native forests, ultimately got trapped in between these two territorialized models of nature appropriation. On one side, the group has not enough bargaining power to confront the advance of the logging companies, which are backed by state regulations and policies. Plantations advanced progressively, clearcutting the relicts of native forest, reducing the space for (the now illegal) timber extraction on plots of forests of peasant's own plots, nature that was highly valued for its economic functions for the peasant mode of living. As a consequence, peasants relied more and more on the woods from the forest reserve.

The process and extent of the territorial transformation allowed us to argue that, even if there are conflicts between the UACH forest conservation approach and the peasant group of LdS, the strongest factor – in impact and size – triggering the conflict arena are the tree plantations, covered by the sustainability discourse of 'green growth'. It becomes clear that the problem is limited by the regime of appropriation of nature on which extractivism is based, that is, a set of regulations

including laws and policies that interact with the local institutions. Therefore, the dichotomy of nature ‘conservation’ versus ‘human needs’ requires to be revisited since extractivism, which plays a silent role in the local conflict arena, becomes the trigger when looking to the broader picture.

As an alternative, we see that actions towards a ‘social sustainability’ that allows for the reproduction of the peasant territoriality of LdS should point towards the legal recognition of more organic ways to appropriate nature (Max-Neef 2016), which maintain cultural practices while satisfying fundamental human needs (Max-Neef et al. 1991). With a binding recognition of territorial rights, new peasant territorialities could emerge by restructuring a way of life based on a respectful appropriation of nature. But this is not easy in the practice, because in the territory a climate of distrust predominates between peasants.

However, both the territorial models and the resource regimes that support extractivism require to be transformed to give space to other forms of exercising territoriality, but such structural transformation is not an easy task. Therefore, in the short term, it is necessary to ‘manage’ the tensions and conflicts by negotiating alternatives for the co-construction of sustainability, which must respect the ecosystem limits and understand that sustainability is a social construct and problem. Nevertheless, this is so difficult in the territory because the peasants are disconnected with the sustainable concept in their local knowledge, and in their productive practices based in timber and charcoal production.

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