

# **Profit Priorities and Cost Distribution**

## *Sociocultural and ecological impacts of Chilean forest management*

*Kjirsten Anne Alexander*

### **I. Introduction**

- a. Political Ecology approach
- b. Neoliberalism and economic rationalism
- c. Methods

### **II. Background and historical context**

- a. History
- b. Chile's forests
- c. The values of Chile's native forests
  - i. Ecological
  - ii. Anthropocentric
- d. Threat to native forest: the plantations industry
  - i. Industry development
  - ii. Scope of the industry
- e. Protections
  - i. Forest policy
  - ii. National Park System (SNASPE)
- f. Future development
  - i. Opportunities for plantations industry expansion
  - ii. Recognizing legislative weaknesses

### **III. Consequences: Who bears the costs?**

- a. Social/cultural impacts on rural and indigenous populations
  - i. Land/livelihood loss
  - ii. Culture/identity loss
  - iii. Rural to urban migration
  - iv. A case study: El Valle de Elicura
- b. Ecological impacts and controversies
  - ii. Contradicting evidence examined

### **IV. Alternatives**

- a. Concrete paths to change
  - i. Redistribution of power
  - ii. Scientific criteria
  - iii. Redistribution of public funding
  - iv. Fulfillment of commitment to promoting Mapuche welfare
  - v. Fulfillment of commitment to ecological preservation
  - vi. Increased monitoring and regulation of industry
  - vii. Market solutions
  - viii. Education
  - ix. Democratic/Grassroots organization
- b. Policy and ecological criteria for improved forest management

### **V. Conclusions**

## **ABSTRACT**

*What does the government prioritize when facing conflicting social, environmental and economic demands? What are the impacts and how can these demands be balanced in a responsible, progressive and humanitarian way?*

This research uses a political ecology framework to discuss the sociocultural, economic and environmental implications of Chilean forest management practices. This is a critical analysis of the Chilean government's priorities, which currently promote an extractive export economy at high social and environmental costs. Despite a growing economy, the wealth disparity in the country is vast and continues to expand. I argue that the government must reorient its focus away from GDP and toward more valuable measures of the country's health. Public funds need to be redistributed to benefit the people in the country and the country's natural treasures rather than subsidizing private industry to attract wealthy foreign investors. This shift in priorities must be implemented in strong, creative policy that supports simultaneous economic growth, environmental preservation, and social justice.

This project is based on personal experiences, interviews and observations from when I lived in Chile during the spring of 2006, as well as on secondary sources that provide scientific and statistical evidence. I describe the history of the forest plantation development, the government's role in creating the industry that exists today, and current statistics that show the scope and significance of the industry. Different sources present conflicting evidence depending on their interests, demonstrating the complexity of the controversies around the social and ecological impacts of the forest plantations. Various avenues for change are possible: policy restructuring, market control methods, improved ecological management, and social and environmental activism promoting government and citizen awareness and responsibility. Government leaders are integral to promoting human rights and environmental preservation and it is their responsibility to prioritize these goals at least as much as private investment.

**Acknowledgements:**

*I would like to thank Kammal Samur Medina and Juan Antonio Painecura for their advice and help in making connections and gathering data especially in the initiation of this project. I also thank Daniel Maribur and Manuel Maribur for openly sharing their knowledge and culture with me. I hope to find a way to repay their kindness and generosity. Thank you as well to Steven Wolf, Marianella Casasola, Ryan Galt and Alicia Swords for valuable input and support in the development of this work.*

Figures:

**Figure 1:** National Forest Surface Area.....23

**Figure 2:** Export volume of woodchips from Chile between 1986 and 1993, indicating the proportion of native species from the temperate forests and pine and eucalyptus plantations..... 26

Tables:

**Table 1:** Annual production of sawn lumber of *Pinus radiata* and native species from 1930-1982..... 26

**Table 2:** Exports from forest sector in US\$ from 1974-2005 ..... 31

**Table 3:** Principle laws implemented in Chile related to the conservation and protection of the native forest..... 35

**Table 4:** Government structures for managing native forest.....38

Images:

**Image 1:** Land use distribution and native forest map of Chile.....21

Appendices:

**Appendix 1-6:** Land use in administrative regions VII – XII<sup>1</sup>.....i-  
vi

**Appendix 7:** Timeline..... vii

---

<sup>1</sup> Neira, Eduardo, Hernán Verscheure, and Carmen Revenga. *Global Forest Watch Chile. Chile's Frontier Forests: Conserving a Global Treasure*. University Austral of Chile, 2002. 43-48.

## II. Introduction

- a. Political Ecology approach
- b. Neoliberalism and economic rationalism
- c. Methods

*“¿Es posible legitimar esta muerte lenta de nuestras valiosas especies originarias? Claro que sí: necesitamos maderas que nos permitan incentivar la industria nacional y mejorar la producción industrial para competir internacionalmente. Todo es entendible si las cosas se miran desde una perspectiva meramente utilitaria.”<sup>2</sup>*

*“Is it possible to justify this slow death of our valuable native species? Of course it is: we need wood to provide incentives to promote national industry and to improve industrial production to compete internationally. Everything is understandable from a merely utilitarian perspective.”*

~ Chilean Senator Roberto Muñoz Barra

Both the benefits from Chile’s rich natural resources and the costs of their exploitation are unequally distributed in the country. Chile has always relied on its abundant natural resources to fuel its economic development; indeed it is considered the most developed country in current-day Latin America. Its geographic diversity and rich nitrate and copper deposits have afforded and continue to afford Chile considerable wealth relative to other Latin American countries. These advantages notwithstanding, Chile has had a tumultuous political and social atmosphere for decades.

In the wake of a harsh dictatorship that implemented drastic free market policies in an attempt to harness a rapidly spiraling economy, Chile is currently grappling with an enormous and increasing wealth disparity. The government encourages foreign investment with attractive industry freedoms and subsidies in order to promote economic growth and competitive participation in the world market, but successfully achieving

---

<sup>2</sup> Chilean Senator Roberto Muñoz Barra. transcribed speech. 2003.

these goals often means compromising in other areas. The negative effects of the dominant economic rationalist ideology are apparent in ecological and social realms.

The Chilean government's approach to forest plantations demonstrates the tension between various demands on the government. Examining the government's relationship to the plantation industry sector exposes which of these demands are adequately met in reality, only on paper or not at all. In this case the government prioritizes economic prosperity in the short term at the cost of fulfilling its obligation to promote social justice and equity and preserve the country's environment and natural resources. These compromises are unacceptable from an environmental justice perspective as well as from the standpoints of ecological and economic sustainability.

As I will demonstrate, the view that the country is too poor *not* to take full advantage of its natural resources is dated and wrong; the current rate of exploitation is something Chile can't afford to pay for socially, environmentally and eventually economically. Economic growth and stability is still possible even if resource exploitation is regulated to conform to acceptable human and environmental standards. It is time that Chilean leaders recognize the full impacts of valuing the peso over all else and begin to prioritize environmental responsibility, human rights, equity and justice.

#### **a. Political Ecology approach:**

I use a political ecology framework<sup>3</sup> to provide a holistic view of the many intertwined components of this issue. Political ecology is based on the premise that the costs and benefits of environmental change are distributed unequally, which reinforces existing inequality and affects power relations.<sup>4</sup> Within this paradigm, political ecologists ask who gains and who loses, what are the hidden costs to society and the

---

<sup>3</sup> Robbins, Paul. *Political Ecology: Critical Introductions to Geography*. Oxford: Blackwell, 2004.

<sup>4</sup> Robbins. *Political Ecology*. 11.

environment, and what are the impacts of power inequality. To answer these questions many different factors from the local to the global scale must be taken into account. The importance of taking a step back to identify larger systems and recognizing the power dynamics, politics and economic factors involved in ecological issues cannot be underestimated.

According to this tradition I address complex government (political), social and environmental relations by integrating various sources and methodologies: personal interviews, participant-observation data and secondary research including published literature, statistical evidence from government and non-government sources, and social, environmental and economic academic sources. These components together describe the effects of the government's narrow focus on private profits, and demonstrate the need for a better balance of priorities. I suggest changes in policy and action that could simultaneously support economic success, environmental preservation and social justice.

As Paul Robbins says, political ecology is an attempt to be both the hatchet and the seed: to expose the current situation with information and criticism while also igniting the discussion of possible alternatives and encouraging further research and dialogue.<sup>5</sup> Political ecology research is founded on the belief that there is "very likely better, less coercive, less exploitative and more sustainable ways of doing things."<sup>6</sup> I present my evidence, criticism and suggestions as a steppingstone toward that better way. I challenge the current conditions, demonstrate the importance of enacting change, and advocate for better management of nature and promotion of human rights.

This work does not follow the traditional format of a scientific question answered by objective hypothesis testing. Rather, this is a composition of evidence gathered to demonstrate the effects of economic, social and environmental policies, to critically

---

<sup>5</sup> Robbins. *Political Ecology*. 12.

<sup>6</sup> Robbins. *Political Ecology*. 12.

analyze the priorities driving these policies, to make normative arguments in favor of reprioritizing, and to discuss concrete solutions. I do not claim disinterest but make clear the values on which my arguments are based: ecological and humanitarian ideals. It is through this lens that I critique the priorities of the government.

My assessment of the situation based on my experiences, observations and research lead me to be firmly opposed to the current governmental support of plantation forest industries. The government prefers to judge the success and health of Chile by its climbing GDP (Gross Domestic Product) rather than delving into the important underlying issues that support that number. I make the normative argument that government values, priorities, and thus policies, must change to acknowledge, research and address the existing problems.

I use the term *government* to refer to the legislating and enforcing nation-state; however, I recognize that the national government is made up of many smaller bodies with different functions. It is when these smaller bodies have conflicting interests that difficulties arise. My intention is to examine which of these interests are ultimately prioritized through legislation as well as enforcement of regulations. I conceptualize the government as a funnel into which many different interests are poured at once: economic, social-civil society, ecological/environmental, international/global, and others. Each pressures for fulfillment, but the government-funnel allows only some to make it through to policy and then even fewer to implementation. The power of the different interests and the priorities of (and pressures on) the government determine which are fulfilled. At the end policies reflect priorities and power filtered through the funnel-government, and tangible outcomes reflect these as well.

**b. Neoliberalism and economic rationalism:**

The Chilean government's neoliberal economic philosophy plays an important role in the history of forest plantation development and continues to be the dominant rationale driving the current political and economic structure of the country. My critique of government priorities is unavoidably also a critique of the neoliberal ideology that shapes them. A brief description of neoliberalism is important to put this discussion in an adequate theoretical context. For this I draw from James McCarthy and Scott Prudham's analysis of the nature of neoliberalism.<sup>7</sup>

Fundamental to neoliberal ideology is a conceptualization of social relations to the environment defined by private property. Neoliberalism can be thought of as an economic system made up of a self-regulating market based on free trade and private property rights, with a state whose primary role is to create and defend the market system, enforce private property rights and stay out of the way of business and industry. Commonly neoliberalization brings about cuts to state resources (in the name of efficiency and competition), especially to those resources that exist to address the negative social and environmental impacts of the capitalist system; this often means monetary and human resources rollbacks, and a redistribution of responsibility from the state to the local level without a simultaneous transfer of power and resources. With a laissez-faire attitude comes the loathing of state intervention, and industry regulation changes from binding to voluntary. Self-regulation and the privatization and commodification of everything are extremely problematic from both an environmental standpoint and a social justice perspective.

Neoliberalism, or "new liberalism" stems from the basic liberal theory that nature is without value unless modified by human labor. The state's role of protecting individual property rights and managing nature by privatization of natural resources is not

---

<sup>7</sup> McCarthy, James and Prudham, Scott. "Neoliberal Nature and the Nature of Neoliberalism." *Geoforum*, no. 35 (2004): 275-283.

meant to preserve the environment, but rather to promote a particular social order where those with land or capital are those with power. If we reject Promethian views<sup>8</sup> that there are unlimited resources and always will be more than enough for everyone, we face the problem of scarcity. If there is not enough to go around then some people will go without, and distribution is highly unequal across social categories such as ethnicity and gender. The conceptualization of nature from a purely utilitarian perspective ignores legitimate values beyond that of market worth, both ecocentric and anthropocentric.

The strongest critiques of neoliberal ideology address its social and environmental impacts. Some of the most powerful sources of political opposition come from environmental and grassroots movements that expose the contradictions, failures and corruption consistently a part of this system. Focused case studies that document environmental and social justice issues in a specific context are especially effective as critical examinations of neoliberal projects because attention to scale, power relations and risk distribution connects the politics and policies to the impacts.<sup>9</sup>

This critique of Chile's neoliberal project examines the sociocultural and environmental impacts within the specific historical and geographic context of its forest plantation system. The rationale for the current neoliberal project in Chile can be described by John Dryzek's discourses of economic and administrative rationalism.<sup>10</sup> These approaches trust the market, if adjusted properly by expert administrators, to solve all issues including social and environmental problems. The assumption is that a strong free market, including environmental goods, will maximize social welfare. Private property rights and incentives form the market, which will solve all inequality and degradation issues if properly tweaked. Faith is placed ultimately in bureaucratic

---

<sup>8</sup> Dryzek, John. *The Politics of the Earth: Environmental Discourses*. 2<sup>nd</sup> ed. New York: Oxford Univ Press, 2005. 51.

<sup>9</sup> McCarthy et al. *Neoliberal Nature*. 279.

<sup>10</sup> Dryzek. *Politics of the Earth*.. 75-98, 121-144.

authorities and scientific experts to determine standards and implement policies accordingly.

This overlooks the value of citizen participation, and assumes that those with power have the public's best interests at heart. The government is the administrative state: it is "not about democracy but about rational management in the service of a clearly defined public interest, informed by the best available expertise."<sup>11</sup> The contradiction in this rationale is that economic rationalist theory depends upon the assumption that each person will act according to his or her own interest, theoretically leaving no one to construct and administer the market system for the benefit of the public.

Even if there were benevolent administrators, all creation and regulation of policy relies on their discretion, and thus on their values. There are choices to be made about which set of conflicting evidence to base policy on, and the decision makers' distance from the issues and their susceptibility to pressures from outside parties place the interests of the public in a precarious situation. In this case, that is exactly the peril; power dynamics influence what research is taken to be valid and industries use their vast power to their advantage. Policy makers who attempt to please everyone create high standards that are not enforced; this is true in Chile where environmental policy looks far better on paper than in the forests.

Economic rationalists react to any suggestion of state intervention with panic: "regulation" is a volatile word with connotations of socialism, control and inefficiency. Given Chile's tumultuous political-economic past it is no surprise that the forest industry's tree-planting, soil-saving rhetoric stands strong against ecological criticism. Companies play on fearful memories of economic disaster to instill distrust in the public of intervention and criticism. Environmental expertise is contradictory depending on the

---

<sup>11</sup> Dryzek. *Politics of the Earth..* 87.

source, land is privatized and subject primarily to the laws of the market, and social inequality and environmental degradation abounds. The government proclaims its commitment to indigenous rights, to preserving its cultural and environmental heritage, and to promoting the welfare of its citizens. But economic priority takes precedence. The plantation system supports the economy and the illusion remains that the country and its citizens must be benefiting: “rising tides raise all boats.”<sup>12</sup>

But who does benefit? As I will demonstrate, it is not those who pay the production costs, not the vast majority of Chilean citizens and not even the 120,000 exploited employees of the forest companies.<sup>13</sup> The oligopolistic network of private enterprises owned and controlled largely by foreign investors benefits, and the foreign consumer appreciates the cheap products. The assumptions of economic and administrative rationalism are not fulfilled. Environmental degradation grows, social injustice worsens and the enormous wealth disparity continues to expand: a new approach is needed. John Dryzek eloquently expresses the importance of looking beyond utilitarian standards: “no matter how attractive economic prescriptions may be in instrumental terms, even to committed environmentalists, they help constitute a discourse, and a world, which those according higher priority to citizenship, democratic, and ecological values find unattractive.”<sup>14</sup>

### **c. Methods:**

The effects of the forest plantations are broad and varied. I strive to present data from different and opposing sources to demonstrate the complexity of the situation because the evidence, particularly related to ecological impacts, is often not

---

<sup>12</sup> McCarthy et al. *Neoliberal Nature*. 279.

<sup>13</sup> Contreras, Rodolfo M. *Más Allá del Bosque: La Explotación Forestal en Chile*. Santiago: Amerinda, 1989. 189.

<sup>14</sup> Dryzek. *Politics of the Earth*. 140.

straightforward. Environmentalist/ecologist perspectives, industry sources, government sources, and Mapuche representatives' perspectives capture the conflicts and display what is at stake in the ecological, social and policy debates surrounding the plantations. I also include current export and area statistics and a description of the forest industry's development and structure to paint a picture of the scope and growth rate of the current forest industry.

The situation of the Mapuche people who suffer loss of land, loss of tradition and identity, and economic hardship epitomizes the social and cultural impacts of the forest plantations; the Mapuche are also at the forefront of activism to change the current system. ♦ There are raging ecological debates over how long the ecosystem can sustain so many hectares of rapidly growing trees, including the positive and negative effects on erosion, soil qualities, water dispersion, water cycles, biodiversity and human life; I include the main arguments from opposing sides. I describe the current and future prospects for this natural resource that Chile so liberally exploits and conclude with suggestions for a new direction in legislation and enforcement around this issue.

I began this research during a four-month long study abroad program in Chile that focused on culture, development and social justice. I chose to conduct my independent research project on the environmental and human impacts of the growing plantations industry because of my interests in social and environmental justice, both of which constitute this issue.

I conducted personal interviews with people working for and against the plantations system and with those caught in the middle. These interviews included a

---

♦ The views I express in this work are based on my personal experience and interviews with Mapuche leaders and community members as well as written sources provided by them. I do my best as an outsider to describe what I perceive to be their plight and their position on these issues but it is necessarily only an interpretation and cannot be representative of all Mapuche people. In fact there is a great deal of variability among Mapuche groups as to how best to approach the issues they face. I focus not on their differing political stances but rather on the situation that one community faces in everyday life.

CEO from the CORMA (the united corporation of forest plantation industries in Chile), an independent forest engineer, an environmental preservationist and member of the “Sociedad de los Amigos del Arbol” (Friends of Trees Society) and various active members of the Mapuche community. My questions included basic factual inquiries about the current situation (scope of the plantations, structure of the forestry corporations, ecological impact, social impact, economic impact), responses to which differed according to the interests of the person interviewed. I also asked opinions on the prospective future of the plantations, the causes of the current situation and how it could be improved, again receiving responses and justifications according to the values and interests of those being interviewed. These interviews helped me to understand the extremely broad range of perspectives on this issue and how much personal interests affect the set of facts that people choose to accept. An additional interview with Alicia Swords, PhD Development Sociology, Cornell University, helped clarify the political dynamics of the Mapuche struggle.

In addition to this series of formal interviews I lived for two weeks in a small Mapuche community in the eighth region of the country that has been completely surrounded by forest plantations. There I learned the community’s perspective on the plantations and saw first hand the environmental impacts of the plantations and direct effects on the livelihoods and health of the people. I began to see the connections between the social, environmental and economic factors of this plantation system, which led me to approach the issues with a political ecology framework.

During the time I spent in the Mapuche community two French ecologists were also staying there to examine the changes in the water cycle of the surrounding area. I conducted interviews with them as well as with community leaders and Mapuche activists, and attended a forum held to discuss the situation of Mapuche political

prisoners charged with terrorism for property destruction in a protest. I attended a seminar on Mapuche cosmovision and met with organizational and religious leaders to glean a sense of their own philosophy on and relationship to the environment. I include their perspective (as I understand it) on the harm caused by the plantations, its implications for the balance of the ecosystems and what they believe must change to turn away from the current path of environmental destruction.

Continuing my research upon my return to the United States I examined many secondary sources. I have followed recent developments in Chilean environmental and forest plantation policy and explored various academic and government sources on the history of the development of the industry, economic and ecological evidence published in support of and against the plantations, and statistics describing the scope of the issue. A few published sources in particular have contributed to the historical, statistical and ecological data that I include, most notably a report created for the Global Forest Watch.<sup>15</sup> This brief booklet focuses primarily on the ecological data and implications, and describes in depth the value of Chile's unique native forest as well as the historical development of forest policy and management. In my own work these elements are central as well. The socio-cultural implications and a discussion of the driving economic forces behind the policies supplements the Global Forest Watch report with a human element.

---

<sup>15</sup> Neira et al. *Global Forest Watch Chile*.

### **III. Background and Historical Context**

- a. History
- b. Chile's Forests
- c. The values of Chile's native forests
  - i. Ecological
  - ii. Anthropocentric
- d. Threat to native forest: the plantations industry
  - i. Industry development
  - ii. Scope of the industry
- e. Protections
  - i. Forest policy
  - ii. National Park System (SNASPE)
- f. Future development
  - i. Opportunities for plantation industry expansion
  - ii. Recognizing legislative weaknesses

#### **a. History**

Over 10,000 years ago the latest glacial period came to an end, and as the ice in South America receded forests formed in their wake and existed largely unaltered in this region for the last 3,000 years. Indigenous people lived within the Chilean temperate forests for thousands of years with little impact on the natural vegetation.<sup>16</sup> Starting in the early 1800s with the arrival of European colonists Chile's landscape began to change. Native forests were burned to create agricultural space and livestock grazing areas. Demand from foreign markets created a large and prosperous wheat sector. Pastures, orchards, vineyards and crops flourished in the fertile soil and displaced acres of native forest. Wood was cut and used for construction and fuel and certain tree species were utilized for medicinal and nutritional purposes. None of this was done with any consideration of sustainable forest management practices.<sup>17</sup> There were never any efforts to promote regeneration of the forest and no management criteria for utilization; many areas that were depleted and barren were simply abandoned. Today less than 60% of the

---

<sup>16</sup> Armesto, Juan J., Arroyo, Mary K., and Villagrán, Carolina, ed. *Ecología de los bosques nativos de Chile (monografías)*. Santiago de Chile: Editorial Universitaria, 1997. 369.

<sup>17</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 370.

estimated 18.4 million hectares of original forest coverage remains. Grasslands, scrublands, urban areas, agriculture and forest plantations occupy the space instead.<sup>18</sup>

Where the Mapuche dominated, between the Biobío River and the Calle-Calle River in the Southern regions, the forest remained intact until the encroachment of the settlers. When the Spanish waged war on the Mapuche in an attempt to overtake their land they lit massive forest fires in an attempt to destroy the Mapuche refuge and habitat and to clear land for agricultural use. In the second half of the 19<sup>th</sup> century the landscape was drastically altered due to the settlers' destructive burning and indiscriminant exploitation of the Alerce forest. In 1815 colonists conquered a large tract of land in the South, which brought division and private ownership. In 1931 the Ley de Bosques Forest Law was created to address serious erosion and degradation problems as well as to promote the diversification of the economy away from sole reliance on mining revenue. This law actually allowed the Chilean government itself to exploit forest reserves, however, which enabled further damage to occur.<sup>19</sup> Experts were called upon to assess the serious damage done to the native forests and in 1944 one such person emphasized the responsibility of the state to reforest degraded areas with diverse species. The advice was not heeded.

Chile has a long history of conflict between conservative landowners and liberal reformists who wish to have a more equal distribution of wealth and power.<sup>20</sup> This conflict has played out in the political sphere through many leaders with different philosophies. In the 1960s Jorge Alessandri (1958-1964) initiated the expropriation of land from wealthy land barons, which was largely ineffective but set an important

---

<sup>18</sup> Neira et al. *Global Forest Watch Chile*. 16.

<sup>19</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 372.

<sup>20</sup> Arthur, Louise et al., ed. *Forest Policy: International Case Studies*. Cambridge: University Press, 1999. 217.

precedent: the state could, with proper compensation, take over land and redistribute it.<sup>21</sup>

Initially the small portion of land that was redistributed went to a few rural peasants.

Later expropriation, distribution and re-expropriation resulted in massive land acquisition for private forest companies and the expansion of forest plantations.<sup>22</sup>

Democratically elected in 1970, socialist president Salvador Allende attempted to bridge the gap between the rich and the poor and address the country's environmental degradation issues. Allende was part of a liberal political economic trend in Chile, and the compromise presidential candidate of the *Unidad Popular* (UP) alliance formed in 1969. Under Allende in 1971 the Native Forest Ecology and Silviculture project was created. This initiated a collaboration of universities and independent researchers who studied the state of the native forest and culminated in a symposium in 1989. There the situation of the native forest was deemed critical due to overexploitation, especially from harvesting for woodchips, and a native forest management strategy was proposed based on the information gathered. In addition to its economic value, the ecological and aesthetic value of the native forest was emphasized, as well as its "increasing national and global importance in an overpopulated, polluted and warming world."<sup>23</sup>

Allende also formed many social programs, made advances for indigenous rights, implemented drastic agrarian reform (which included major redistribution of private land, some of which went to Mapuche communities), created jobs, froze prices and nationalized large industries. In the following three years unemployment dropped but the economy fell into crisis. Industries became inefficient, the market slid toward chaos and

---

<sup>21</sup> Collier, Simon and Sater, William. *A History of Chile, 1808-2002*. Cambridge: University Press, 2004. 281.

<sup>22</sup> Samur, Kammal. "Globalización en tierras Mapuche." topic summary, Temuco, Chile, 2006.

<sup>23</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 376.

inflation spiked. It is difficult to say how much the United States' propaganda<sup>♦</sup> and investors' fear of nationalization influenced this economic crisis, but the results were unmistakably monumental: increasing unrest brought about a military coup on September 11, 1973.<sup>24</sup>

General Augustus Pinochet (1915-2006), originally one of four members of the military *junta* that led the coup, rapidly maneuvered himself into the head position of power and attempted to reverse the downward spiral by implementing drastic economic changes: a capitalist, neoliberal system. Pinochet remained in power until 1990 and didn't budge from this strictly capitalist model; many of his policies still remain in place today. With support from four American-educated economists known as the Chicago Boys, Pinochet privatized industry and opened doors for a very free market. To boost the economy they discouraged imports through substitution and high tariffs and promoted exports, especially extractive exports such as agriculture, fish, lumber and minerals.<sup>25</sup>

The panic caused by economic downturn during Allende was quelled by these drastic measures, which were implemented literally at any cost. Pinochet was a brutal dictator; his success in promoting economic growth and world market competition for Chile was surpassed only by his notoriety for ruthless measures to achieve his goals and despicable human rights abuses. His priority was the economy; social and environmental justice issues were not even on his list. The forest plantations sector was one of the first to reflect these priorities.

Since Pinochet fell in a plebiscite in 1990 there has been a succession of democratically elected presidents, the latest both a socialist and a woman: a sure sign of

---

<sup>♦</sup> The United States' role in orchestrating the military coup is widely understood. Many sources cite the political and economic pressures applied in order to eliminate this new leftist government and thus the spread of communism, and some say that Chile served as an experiment in Neoliberalism for the U.S.

<sup>24</sup> Arthur et al. *Forest Policy*. 217.

<sup>25</sup> Silva, Eduardo. "The Politics of Sustainable Development: Native forest policy in Chile, Venezuela, Costa Rica and Mexico." *Journal of Latin American Studies* 29, (1997) 457-493, 4.

recuperating progressive movements. Space opened up for a wider range of issues to be addressed after Pinochet's harsh regime in which environmental concerns were shunned. Changes in priorities became possible and more voices could be heard including the environmental movements. The newly elected government leaders were not bold in their reforms, however. They avoided the more difficult issues, tabling them for the future. The government remains fully committed to neoliberalism and the power structure and laws Pinochet implemented were maintained. Administrations have all failed to take any strong stance on this issue, perhaps due to a lingering fear of economic stagnation and its associated misery as well as because of pressures from those with a vested interest in maintaining the current economic system.

The government still fails to act on the growing inequality that exists despite an overall "healthy" economy. Allowing unfettered plantation expansion and extraction of natural resources to try to ensure the continuation of a rising GDP is irresponsible. Not only is the resource limited, which has implications for the economic sustainability of the industry as well as environmental sustainability, but the price of such free reign given to industry is too high to pay. Goals and priorities must be balanced in order to reflect humanitarian and ecological values including social justice, equitable growth and environmental responsibility.

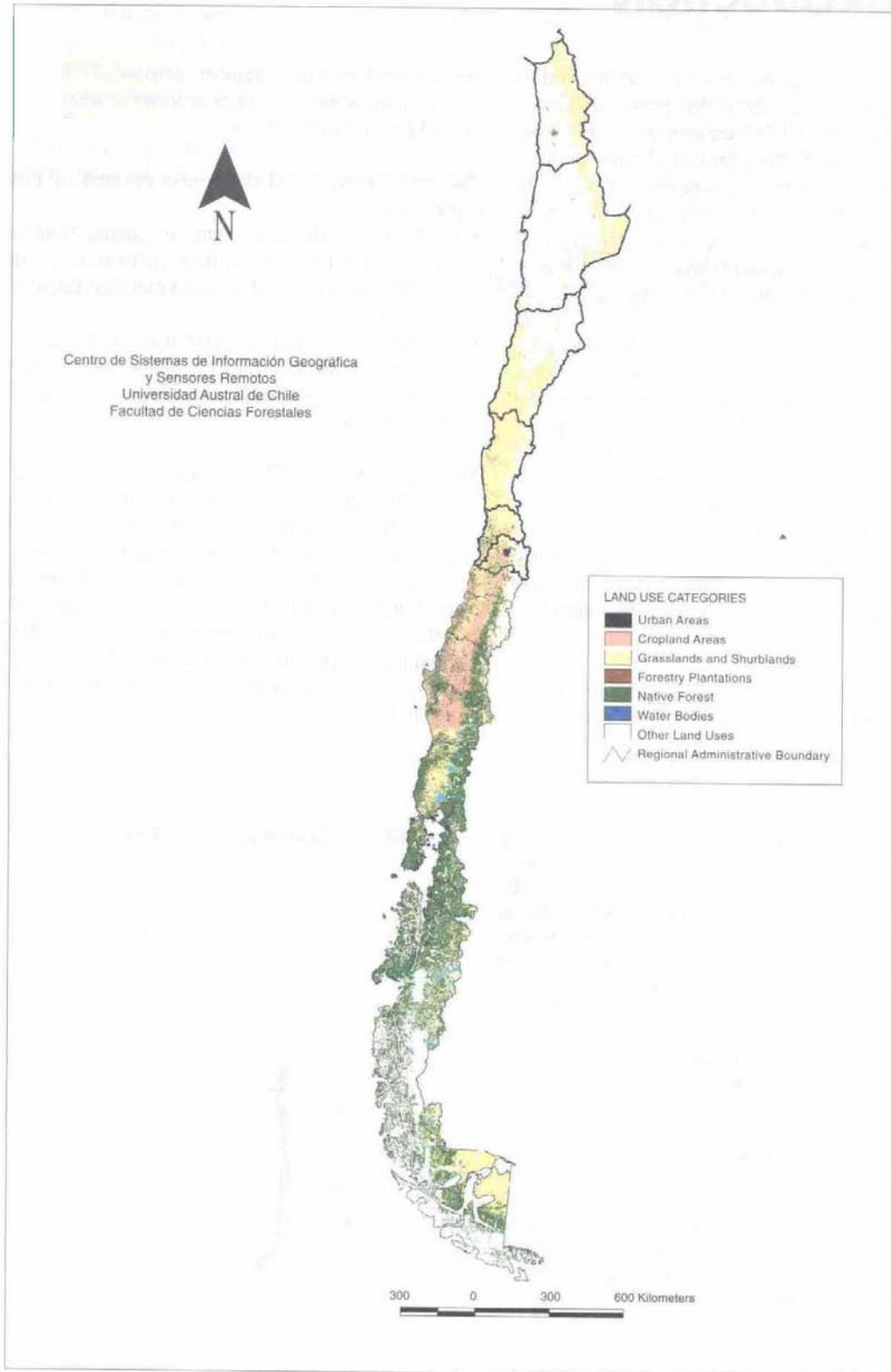
## **b. Chile's forests**

*"Es un mundo vertical: una nación de pájaros, una muchedumbre de hojas... Un tronco podrido: ¡qué tesoro!... hongos negros y azules le han dado orejas, rojas plantas parásitas lo han colmado de rubíes, otras plantas perezosas le han prestado sus barbas... Más lejos cada árbol se separó de sus semejantes... Se yerguen sobre la alfombra de la selva secreta, y cada uno de los follajes, lineal, encrespado, ramoso, lanceolado, tiene un estilo diferente, como cortado por una tijera de movimientos infinitos... Una barranca; abajo el agua transparente se desliza sobre el granito y el jaspe... Quien no conoce el bosque chileno, no conoce este planeta."*

~Pablo Neruda, en *Confieso que he vivido*

Image 1

DISTRIBUTION OF DIFFERENT LAND USES AND NATIVE FORESTS IN CHILE



Chile spans about 32 degrees of latitude, or 2,880 miles, but is no wider than 265 miles at any point. Natural borders are formed on the east by the massive Andes mountain range and on the west by the Pacific Ocean. Political borders include Argentina and Bolivia on the east and Perú on the north. The country is divided into thirteen different regions from north to south, with hot dry desert in the north, a Mediterranean climate in the central zone, and a cool, rainy southern climate blending to the dramatic frozen landscape of Patagonia and Tierra del Fuego.

Chile's uniquely diverse geography affords the country a variety of natural resources. These include a range of unique and diverse forest ecosystems ecologically valuable for their heterogeneity and endemism, including about one third of the world's remaining temperate forests (in the range of 35° to 55° South latitude).<sup>27</sup> Evidence suggests that the temperate forests formed in the wake of continental glaciers and include some trees that are more than 3,000 years old. The natural areas with the highest biodiversity are between the VIII and X regions, which are also the most threatened by replacement with exotic plantation monocultures.<sup>28</sup> The majority of Chile's forest plantations are concentrated in the southern regions, especially the VIII region, where fertile soil and rainy climate allows quick growth, but plantations extend as far as the V (and most central) region. [See Appendices 1-6 for plantation distribution in regions VII-XII.]

The entire area of Chile is about 75,662,560.5 ha. About 20% is forested area, or 15,637,232.47 ha: almost half of all productive land. 85.8% of this (13,430,602.5 ha) is deemed native forest and 13.5% are plantations, or 2,119,004.5 ha [see Figure 1].<sup>29</sup>

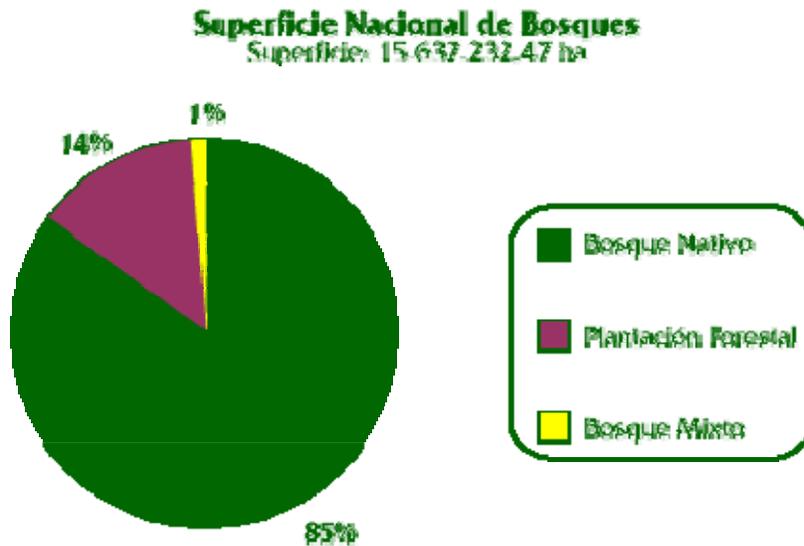
---

<sup>27</sup> Neira et al. *Global Forest Watch Chile*. 11.

<sup>28</sup> Neira et al. *Global Forest Watch Chile*. 11.

<sup>29</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=19266dd808e79a19d6c4d6d70elbcd28&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=19266dd808e79a19d6c4d6d70elbcd28&unidad=0&), retrieved 11/9/06.

**Figure 1: National Forest Surface Area: 15,637,232.47 ha**<sup>30</sup>  
Green: Native Forest (85%), Pink: Forest Plantations (14%), Yellow: Mixed Forest (1%)



### **c. The Values of Chile's Native Forest**

#### **i. Ecological**

The intrinsic ecological value of Chile's native forest has been well documented. The Global Forest Watch released a report in 2002 describing the importance of Chile's remaining large areas (greater than 10,000 ha) of undisturbed original temperate forests, deemed "frontier forests."<sup>31</sup> A discussion of the ecological value of these forests is relevant to the importance of their conservation. Important functions and values include genetic variability, habitat and source of food for herbivores and pollinators of forest plants, unique tree species with high growth rates, regulation of hydrological balance and water quality, and sustenance of the nutrient cycle.<sup>32</sup>

Like the geography and climates of the country, Chilean forests vary drastically from North to South and include almost every southern hemispheric temperate forest

<sup>30</sup> CONAF.[http://www.conaf.cl/?page=home/contents&seccion\\_id=19266d\\_d808e79a19d6c4d6d70e1bcd28&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=19266d_d808e79a19d6c4d6d70e1bcd28&unidad=0&). retrieved 11/9/06.

<sup>31</sup> Neira et al. *Global Forest Watch Chile*. 6.

<sup>32</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 412.

type. Palm, *Sclerophyllous* (in the dry climates), ancient araucaria, temperate rainforests, and alerce forests all thrive in Chile. The araucaria trees are now protected as a national monument due to intense logging that threatened the survival of this prehistoric species; within the alerce forests there are conifers that top all others in the Southern Hemisphere for size and longevity. These are often compared to the redwoods of the Pacific Northwestern United States and some are more than 3,000 years old. Ecosystem services of the forests include carbon absorption, flood control, water purification, nutrient cycles, and profound biodiversity that are valuable scientifically for their genetic material and evolutionarily for their resilience and adaptability.<sup>33</sup>

Biodiversity and endemism are two of the most important attributes of the native forest as a potential source of increasingly valuable unique genetic resources. A conservative estimate of the number of vascular plant species in the native forest is between 850 and 900. There are 11 mammal species, 24 amphibian species, 5 reptile species, 13 bird species and 13 fish species endemic to the temperate forests.<sup>34</sup> However many species have already become extinct in the last fifty years, and many more of the terrestrial and aquatic vertebrates as well as tree species that inhabit temperate forests are in danger of extinction. “Between 60% and 100% of endemic species are officially in a vulnerable state of conservation, the principle cause being extreme reduction and fragmentation of native forest areas, affects on water quantity and quality, and microclimate changes in the habitats.”<sup>35</sup> The fragmentation of the forests decreases available habitats, which is problematic for mammals with a large range.

---

<sup>33</sup> Neira et al. *Global Forest Watch Chile*. Introduction.

<sup>34</sup> Neira et al. *Global Forest Watch Chile*. 19.

<sup>35</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 407.

## **ii. Anthropocentric**

In addition to ecological reasons, the native forests are also valuable from a human standpoint. Ecotourism and recreation provide income and enjoyment for many people. Rural communities often rely on the forests for fuel, nutrition and materials and especially for local indigenous communities the forests hold significant sacred and cultural meaning. The forests' ecological functions are valuable for people as well, such as carbon absorption and bioprospecting, or the testing of newly discovered species for chemical properties that may have therapeutic properties. This has become an important justification for some conservation efforts. It is probable that many thousands or even millions of species exist that have yet to be classified by taxonomists, and the potential for undiscovered curative properties is an important reason to preserve the biodiversity and endemism of the native forest.<sup>36</sup>

## **d. Threat to native forest: the plantations industry**

### **i. Industry development**

Monterey pine (*Pinus radiata*) was first introduced around 1880 for decorative purposes. The growing scarcity of native wood resources and the rapid growth rate of the pine then made it valuable to grow for utilitarian reasons. Between 1930 and 1935 about 24,000 ha of pine were planted. The plantations sector grew exponentially while exploitation of native species remained basically stable until 1969 [see Table 1 and Figure 2].<sup>37</sup>

---

<sup>36</sup> Eisner, Tom. "What's in a species?" State of the Planet: Lecture 4/18/07. Cornell University.

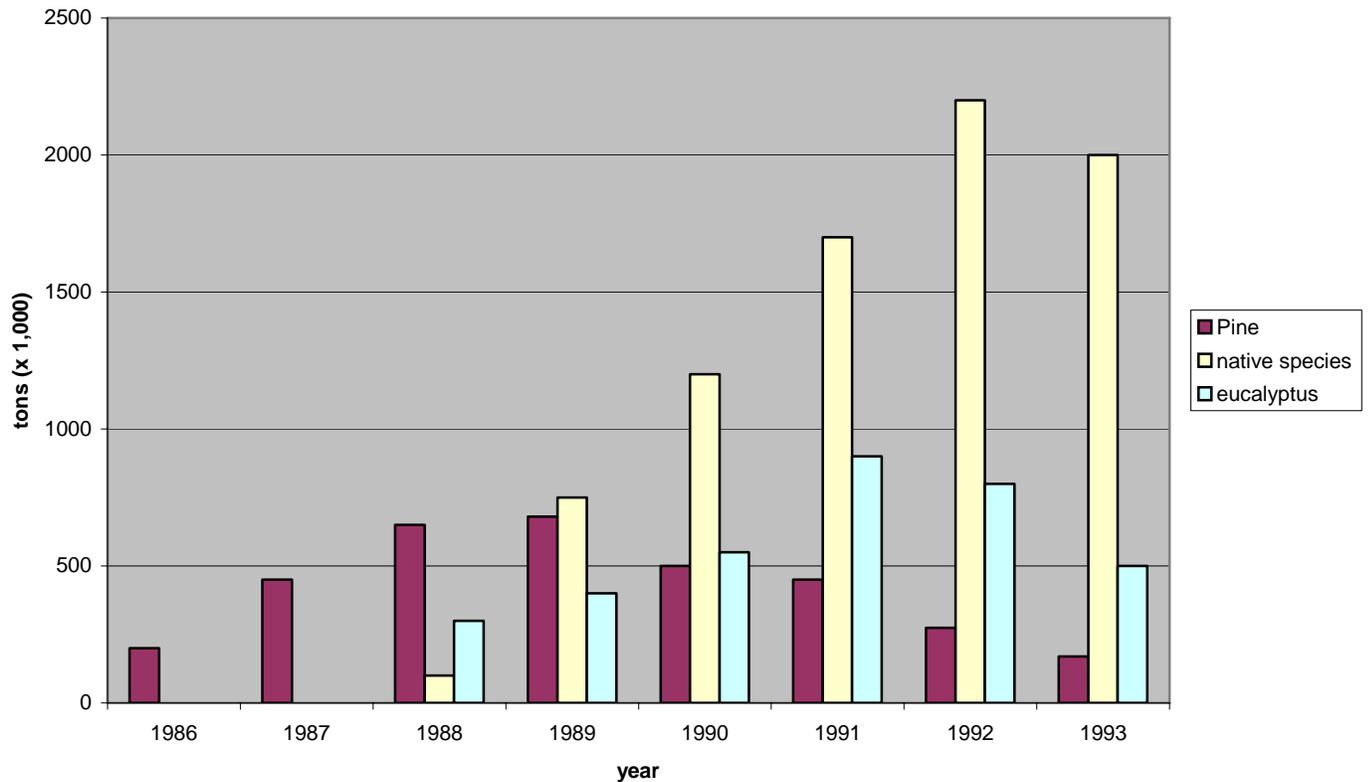
<sup>37</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 374.

**Table 1. Annual production of sawn lumber (x 1,000 m<sup>3</sup>) of *Pinus radiata* and native species from 1930-1982.<sup>38</sup>**

[see Figure 1, p22 for native and plantation forest proportion]

Period:	Total	Pine ave. volume	Pine ave. %	Native Species ave. volume	Native Species ave. %
1930-39	343	13	3	340	97
1940-49	622	44	7.5	580	92.5
1950-59	594	84	14	510	86
1960-69	898	385	41.3	550	58.7
1970-79	1.266	1.024	79.2	240	20.8
1980-82	1.720	1.455	85.0	265	15

**Figure 2. Export volume of woodchips (tons x 1,000) from Chile between 1986 and 1993, indicating the proportion of native species from the temperate forests, pine plantations and eucalyptus plantations.<sup>39</sup>**



<sup>38</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 374.

<sup>39</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 339.

Before the 1920s Chile imported much of its lumber from the United States but gradually began relying more on its own supply to meet domestic demand. At this point about two thirds of the forested area was technically owned by the government but there was little enforcement of forest legislation, and conservation of resources and scientific exploitation were not practiced.<sup>40</sup> Ralph Ackerman pointed out in a report to the U.S. Department of Commerce in 1925 that Chile was increasingly relying on its own native timber and an export market was forming in other Latin American nations.<sup>41</sup> Chile had yet to realize the potential for exotic species plantations and mainly harvested native hardwood species, including the now protected araucaria pine, but the author pointed out the clear opportunity for a large scale plantations industry due to “climatic and soil conditions which would permit them to be advantageously cultivated to better serve the industrial needs of the country than is now being done by certain natural species.”<sup>42</sup> This was a turning point in the industry.

Lumber and wood products became a very important component of Chile’s economy. Around the 1950s commercial logging began to develop to supply increasing numbers of sawmills. As harvestable acreage of native forest rapidly diminished through exploitation and environmental concern began to grow, the primary timber source shifted away from native forest. The government and forest companies came up with a way to take the demand off of native forests and at the same time, they claimed, control erosion in exposed areas: plantations of Monterey pine (*Pinus radiata*) and eucalyptus (*Eucalyptus spp.*).<sup>43</sup>

---

<sup>40</sup> Ackerman, Ralph H. “Forest Resources and Lumber Industry of Chile.” *Supplement to Commerce Reports, Trade Information Bulletin No. 324, United States Department of Commerce*. Washington: Government Printing Office. 1925. 7.

<sup>41</sup> Ackerman. “Forest Resources Chile.” 2.

<sup>42</sup> Ackerman. “Forest Resources Chile.” 2.

<sup>43</sup> Neira et al. *Global Forest Watch Chile*. 8.

In 1966 the Ministry of Agriculture proposed a reforestation plan to plant 450,000 ha, of which 150,000 ha would be pine plantations. This goal was not reached; in 1970 although Chile was considered to have the best forestry system in Latin America the remaining native forest was severely degraded and the rest was rows of pine. The state did not take initiative to fulfill its role of monitoring, conservation and sustainable management of this valuable resource.

Plantations expanded to provide raw materials to an increasing pulp and paper sector and the native forest sawnwood volume was surpassed by plantation forest harvests in the mid-1960s.<sup>44</sup> By the mid-1970s “conditions warranted the establishment of a resource base capable of supplying an important, diverse and integrated forest industry.”<sup>45</sup> Conditions were in fact carefully created to warrant this establishment. The government encouraged expansion of the industry; production rose, which spurred the growth of secondary manufacturers, which increased demand for primary resources enough to justify further expansion. The Chilean state also provided a guaranteed market of state pulp mills.

In 1986 the international market demand for woodchips to supply manufacturers with cellulose fiber and pulp for paper products skyrocketed, as did the pressure on native forest resources once again. The native *Nothofagus* is preferred for woodchips and the harvest practices are enormously destructive; contrary to proper management, loggers would clear-cut everything or cut only the healthiest trees and leave the weakest. The ancient frontier forests are particularly vulnerable since they contain much of the valuable *Nothofagus* species.<sup>46</sup>

Late in the 20<sup>th</sup> century relative economic prosperity and political and social stability in addition to very generous government incentives (through subsidies and tax

---

<sup>44</sup> Arthur et al. *Forest Policy*. 218.

<sup>45</sup> Arthur et al. *Forest Policy*. 216.

<sup>46</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 383.

benefits, as I will describe) gave rise to a new wave of fast-growing managed plantations and what today is Chile's vast forest industry.<sup>47</sup>

## ii. Scope of the industry

The total area of Chilean forest includes 15,637,232.47 ha, about 13.5% (2,119,004.5 ha)<sup>48</sup> of which are plantations of pine, eucalyptus and some other tree species (representing 2.8% of national surface area).<sup>49</sup> The Monterey pine is native to California and nearby islands. Although the species is exotic in Chile it caught on rapidly as a supposedly sustainable, renewable resource. Of the plantations about 76% are pine which can provide two commercial thinnings and a clearcut every 25 to 28 years. 17% are eucalyptus, which have an average rotation of 8 years.<sup>50</sup> Many of these plantations are concentrated in the central-southern region of Chile (region Bío Bío VIII and region Araucanía IX) [see appendices 1-6].<sup>51</sup>

One of the important premises upon which forest companies justify their extensive plantations is that they plant in eroded areas with poor, sandy soil and little vegetation. They claim that planting trees on barren land recuperates those areas, simultaneously taking pressure off of native forest by planting exotic species. This justification for expansion was especially convenient for the government because it appeared to fulfill both preservation and economic goals; however it in fact hugely favored industry while failing to perform the anti-degradation and protection functions it was supposedly created for, in addition to causing other unforeseen adverse effects. New plantations often displace native forest, and eucalyptus and pine actually fill different

---

<sup>47</sup> Arthur et al. *Forest Policy*. 218.

<sup>48</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=19266dd808e79a19d6c4d6d70e1bcd28&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=19266dd808e79a19d6c4d6d70e1bcd28&unidad=0&), retrieved 11/9/06.

<sup>49</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=19266dd808e79a19d6c4d6d70e1bcd28&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=19266dd808e79a19d6c4d6d70e1bcd28&unidad=0&), retrieved 11/9/06.

<sup>50</sup> Arthur et al. *Forest Policy*. 221.

<sup>51</sup> Arthur et al. *Forest Policy*. 221.

economic niches than native hardwood products; thus pressure on native forest from logging remains.<sup>52</sup>

In 1940 about 70% of cut wood volume came from native forests. This decreased to 25% in 1974.<sup>53</sup> Despite some protective laws, a significant amount of wood products continue to come from the exploitation of natural hardwood tree species. Hardwood- both eucalyptus and native hardwood species- is often used for woodchips or as timber for products such as veneers and high quality furniture while the softwood pine makes fiberboard, particleboard and woodchips. Even in the decade of the 1950s the yearly average native hardwood production was 600,000 m<sup>3</sup> and only in the mid-60s did plantations sawn wood volume surpass that of native forests.<sup>54</sup> The focus returned again to native forests in the 1980s as a source of hardwood chips and certain high quality lumber and veneer- in fact by 1991 hardwood chips from selective logging of native forest accounted for 56% of wood exports.<sup>55</sup>

The state's efforts at promoting the forest industry through favorable policy and attractive incentives have not been in vain. The industry has grown with a wide market of more than 100 countries to be Chile's second largest industry and income earner: about US\$ 3.3 billion in foreign sales in 2004.<sup>56</sup> The forestry sector currently is one of Chile's four main exports including timber, copper, fruit and fish. It is considered the most important export in the Chilean economy after copper and continues to expand. The total value of annual forest product exports has ballooned in the past 30 years [see Table 2]. According to the Auge Exportador of 1995, the distribution of production was 33.8% pulp/paper, wood chips 16.6%, sawn wood 15.6%, newspaper 7.4%, and logs 7.2%. As of 1995 there were 1,800 forest companies, 90% of which were sawmills. Exports

---

<sup>52</sup> Arthur et al. *Forest Policy*. 223.

<sup>53</sup> Contreras. *Más allá del bosque*. 53.

<sup>54</sup> Arthur et al. *Forest Policy*. 218.

<sup>55</sup> Arthur et al. *Forest Policy*. 221.

<sup>56</sup> Chilean Government. *Chileinfo*. www.Chileinfo.com, retrieved 9/26/06.

increasingly include finished goods but raw materials make up the substantial majority with Japan importing 25% of total Chilean wood exports, followed by the US and Korea at 11% each.<sup>57</sup>

**Table 2. Exports from forest sector in US\$ from 1974-2005**<sup>58</sup>

Year	Exports (US\$)
1974	127 million
1991	750 million
1995	2.4 billion
2005	3.5 billion <sup>59</sup>

According to the goals set by the industry and government, forestry development is a success. Market opportunities, low production costs, technological advancements, and most importantly government policies all spurred the rapid plantations growth.

Technology including genetic engineering, pesticides/blight control, research investments, management plans and forest fire control improved the hardiness and yield of the plantations.<sup>60</sup> Human capital was also an important component with an increasing number of specialized professionals (forest engineers) helping to transform the sector into a world competitor.

Market niches opened up for furniture exports in the 1980s due to fluctuations in production in other large wood-product exporting South American countries such as Brazil. Chile was able to penetrate the market in the furniture industry in the US, Asia

<sup>57</sup> Meller, Patricio and Sáez, Raúl Eduardo., ed. *Auge Exportador Chileno: Lecciones y desafíos futuros*. Santiago: Alfabetá Impresores, 1995, 113.

<sup>58</sup> Arthur et al. *Forest Policy*. 226.

<sup>59</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=4c77e1e37ff8efbf24c73f1b9042f7c6&id\\_ioma=-1&unidad=0&pagina=?](http://www.conaf.cl/?page=home/contents&seccion_id=4c77e1e37ff8efbf24c73f1b9042f7c6&id_ioma=-1&unidad=0&pagina=?), retrieved 11/9/06.

<sup>60</sup> Meller et al. *Auge Exportador Chileno*. 126.

and Europe (in 1985 furniture exports were worth US \$0.5 million; ten years later the sum was US \$30 million and growing).<sup>61</sup> The development and diversification of foreign markets and increase in number of products were key to the expansion of the forestry sector exports.

Between 1977 and 1991 the number of different products produced (including those with value added such as doors, window frames, and furniture) jumped from 61 to 385 and the number of countries importing Chilean products expanded from 40 to 76. In order to improve these numbers still more there needs to be quality certification, more manufacturing companies and improvement in technology to increase productivity. Some of the existing advantages include low raw material cost and low manual labor cost. Large plantations companies take advantage of the lack of restraint to promote the highest possible profit returns, at the expense of low (or no) compensation for those who bear the costs of production including the laborers and those who live surrounded by the plantations.<sup>62</sup>

The sudden and thorough privatization of the plantations industry in 1974 with Pinochet's new policies was yet another key to the plantations' rapid growth. This was an attractive piece of bait; promise of little government interference along with a great deal of financial assistance successfully lured investors. Rapid economic growth and the government's strict adherence to the free-market hands-off philosophy ensured continued investments and still more growth.

The plantations' rapid shift from state-owned and regulated to private and subsidized was swift and thorough and effectively stimulated growth of the industry: in 1975 and 1976 over half of the plantations were established by the government, from 1977 to 1986 the private sector planted over 50% and since 1986 commercial

---

<sup>61</sup> Meller et al. *Auge Exportador Chileno*. 129.

<sup>62</sup> Contreras. *Más Allá del Bosque*. 220.

reforestation has been only private.<sup>63</sup> In the years between 1987 and 1996 an average of 98,000 ha of plantations per year were added; the most planted was in 1992 with 130,429 ha.<sup>64</sup> Between 1974 and 1986, the Chilean government paid US \$53 million to timber companies, and total government spending to subsidize the industry in the 20 years that the forest law 701 was in effect from 1974 to 1994 was about US \$135 million.<sup>65</sup>

Over the same time period exports increased from US \$127 million to \$1.5 billion. In 1995 expectations for forest product exports in the year 2000 were US \$2 billion and in the year 2010 they were projected to increase to \$3 billion; in fact in the year 2000 exports reached US \$2.4 billion and by 2005 exports already totaled US \$3.5 billion.<sup>66</sup> The government's investment was clearly successful in creating a vast, booming forest plantation industry. The policies implemented for the protection of the native forest were far less successful however.

## **e. Protections**

*“The current path of forestry in Chile is unsustainable and threatens the existence of its forest ecosystems. Preservation of the genetic diversity and habitat and endangered species is mandated by Chile’s various environmental laws, but the consequences of this commitment to preserving habitat have not yet been addressed.”<sup>67</sup>*

### **i. Forest policy**

The first forest law was in 1873 when protection of native forest was recognized as valuable and the *Reglamento General de Corta* was implemented to control type, age, height, and area of cutting and established fines for illegal harvesting and rangers to monitor state land. Despite these measures, the law was poorly enforced and major

---

<sup>63</sup> Arthur et al. *Forest Policy*. 221.

<sup>64</sup> Arthur et al. *Forest Policy*. 221.

<sup>65</sup> Meller et al. *Auge Exportador Chileno*. 119.

<sup>66</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=4c77e1e37ff8efbf24c73f1b9042f7c6&id\\_ioma=-1&unidad=0&pagina=?](http://www.conaf.cl/?page=home/contents&seccion_id=4c77e1e37ff8efbf24c73f1b9042f7c6&id_ioma=-1&unidad=0&pagina=?), retrieved 11/9/06.

<sup>67</sup> Clapp. “Waiting for the forest law.” 30.

destruction continued.<sup>68</sup> The second law in 1931, Ley de Bosques: Decreto Supremo 4363 (D.S. 4363), encouraged plantation growth as an alternative to native forest harvesting<sup>69</sup>. This law was to promote the creation of plantations in eroded areas with poor, sandy soil while taking the pressure off of native forests. The forest law of 1931 served more as an excuse for expansion of plantations and did very little to ensure that the native forest was protected. The policy was perfect for alleviating public concern about environmental degradation but the government's lack of follow up on native forest protection was tacit approval for its continued destruction. This is an example of the government's lax enforcement and allowance of continued exploitation through loopholes in the law.

More than 40 years later the third major forest policy was implemented, Decreto Ley 701 (D.L. 701) in the year 1974. [See Table 3 for a list of major forest legislation.] This was one of the first measures Pinochet took to attract foreign investment through generous government incentives to turn around the faltering economy when the military junta seized power. D.L. 701 privatized most government land and promised a generous subsidy of three quarters the cost of planting and tending new plantations. When D.L. 701 privatized the plantations industries this freed the state of managerial responsibility. The state claimed this meant it could focus more on fiscal labor and the creation of a network of nature reserves and national parks. The forest law included obligations for protecting the forest resource (however it is not specified whether as a resource to harvest in the future or an untouchable native forest).

D.L. 701 was meant explicitly to "reforest," and if the subsidies had been applied to native forest recuperation and management, an extensive valuable sustainable resource would exist today. Instead forest industries destroyed huge tracts of native forest; D.L.

---

<sup>68</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 337.

<sup>69</sup> Meller et al. *Auge Exportador Chileno*. 118.

701 was applied indiscriminately to promote the substitution (and destruction) of the native forest with plantations. The incentives and legislation did not have intended effects on the conservation and sustainable management of the Chilean native forest.<sup>70</sup>

**Table 3.<sup>71</sup> Principle laws implemented in Chile related to the conservation and protection of the native forest:**

<b>LEGISLATION</b>	<b>DATE</b>
Ordinance of New Spain and Indian Laws	1855
Civil Code (Article 783)	1871-2
Laws for General Regulation of Logging	1883
Decree Law 656	1925
DFL 256	1931
Supreme Decree Forest Law 4.363	1931
Washington Convention of 1940	1967
Decree Law 701 of Forest Development	1974
CITES Convention of 1973	1975
Modification of DL 701	1979
Law 18.348 CONAF and Protection of Renewable Natural Resources	x
Law 18.362 National System of State Protected Wild Areas	1984
D.S. 193a. Regarding forestation, management, cutting and reforestation	1998

This new law was aimed to be an incentive for private investment and compensate for the length of time between initial investment and returns due to the years of maturation for trees with the 75% subsidy and significant tax exemptions. Other attractions for investment included the main bank of Chile, Banco Central, creating a line

<sup>70</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 382.

<sup>71</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 339.

of credit for large companies to start plantations between the years 1975 and 1979.<sup>72</sup> One of the major problems with this incentive is that it favors large industry because many of the benefits are not applicable to smaller landowners- further propagating the wealth disparity and benefiting foreign investors rather than Chilean citizens.

In addition to these giant financial incentives to make investment appealing, with privatization of the industry the state relinquished much of its regulatory control over production, allowing the companies space for initiatives and increasing efficiency in the process. D.L. 701 made the forest sector unable to be expropriated, that is according to this law the state could not take over control from private ownership. The forest industry was rapidly weaned from state to private hands and was given free reign. Contrary to true neoliberal doctrine (market determinism: may only the efficient survive) however, the forest industries were sheltered under the state's financial umbrella in the form of these giant benefits. Ironically this financial support as well as the preceding years of careful nurturing of the industry meant that it did not form and survive under the pure free-market prescriptions; the government deliberately created it and ensured its survival with huge amounts of public funding. Conditions were necessarily hospitable, both environmentally and in the international market, but the industry would not be anywhere near the scale it is today were it not for the firm guiding hand of the state.

There are many convenient loopholes in existing legislation that forest companies take advantage of. For example, current legislation permits CONAF [see table 4] to approve conversion of native forest to agricultural land, and the landowner may completely clear the area with no stipulations that it must be regenerated. Then this agricultural land may be converted to plantations without request for approval.<sup>73</sup> This occurs frequently, especially as farmers find it more profitable to sell their land to large

---

<sup>72</sup> Meller et al. *Auge Exportador Chileno*. 119.

<sup>73</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 341.

companies and move to urban areas.<sup>74</sup> Many of the government agencies that manage and regulate native forest exploitation and plantation development either directly or inadvertently serve industry interests [see Table 4]. Those agencies that are in charge of enforcing regulations are usually fairly ineffective due to lack of resources and underfunding.<sup>75</sup>

Law 701 favors large companies by not providing capital, credit or technical assistance to small landowners,<sup>76</sup> thus increasing the likelihood that they will sell their land to large industries and move to the cities. ♦ The large-scale migration of rural inhabitants to the city is one of the main social problems that results from this system of plantations. Often these people move to urban areas with high poverty levels, few opportunities and minimal support services.<sup>77</sup>

---

<sup>74</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 347.

<sup>75</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 357.

<sup>76</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 347.

♦ Since 1990 there have been some changes in legislation to support smaller landowners if they want to manage plantations on their property. This may be an important step toward more equitable and sustainable management of native forest resources as well as smaller scale plantations.

<sup>77</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 348.

**Table 4. Government structures for the protection and management of native forest**

INFOR	Instituto Forestal de Chile Support public and private forest activities via research and technological development including: “improving information on forest resources and land use, diversifying production options, and promoting increased domestic consumption and exports of forest products.” <sup>78</sup>
CORFO	Corporación de Fomento de la Producción (1938) Further develop wood and wood product industries
CONAF	Corporación Nacional Forestal (1971) Centralized technical labor and administrative responsibilities of managing the newly expropriated forest industry: roles of development, coordination and control of the forest (creation, management and exploitation of forest resources among small landowners), worker training, research, promote regeneration, enforce native forest policies. <sup>79</sup>
CONAMA	Comisión Nacional del Medio Ambiente Administer environmental impact assessments and evaluate infrastructure developments with the power to impose certain conditions on projects. <sup>80</sup>

#### ii. National Park System: SNASPE

The government created in 1984 through law 18.362 the National System of State Wild Areas (SNASPE) in order to protect, manage and conserve land or aquatic natural areas. These areas are divided into national parks (currently numbering 32), national reserves (48) and national monuments (15), covering in total about 14 million ha, or 19% of national territory. Considered one of Latin America’s best, this network of protected area appears impressive at first glance.<sup>81</sup>

The SNASPE system is inadequate in many ways however. Although national *parks* include natural resources that officially cannot be used for economic ends and are deemed protected, national *reserves* can be used in a “sustainable manner.”<sup>82</sup> This loose

<sup>78</sup> Neira et al. *Global Forest Watch Chile*. 23.

<sup>79</sup> Neira et al. *Global Forest Watch Chile*. 23.

<sup>80</sup> Neira et al. *Global Forest Watch Chile*. 23.

<sup>81</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=50ab36fbde3b307849b7586acebbe9e8&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=50ab36fbde3b307849b7586acebbe9e8&unidad=0&), retrieved 11/9/06.

<sup>82</sup> CONAF. [http://www.conaf.cl/?page=home/contents&seccion\\_id=f4b562225d752a6c79a34c0c9cc295ec&unidad=0&](http://www.conaf.cl/?page=home/contents&seccion_id=f4b562225d752a6c79a34c0c9cc295ec&unidad=0&), retrieved 11/9/06.

wording leaves plenty of room for interpretation to loggers, and lack of accountability lends very little substance to the label of a protected reserve.

SNASPE is also insufficiently proportioned; despite the high percentage of national territory included, most of the protected areas lie in the XI and XII regions, which are relatively unthreatened by people or plantations. This leaves the areas with the most ecological endemism and the highest density of species vulnerable to destruction. SNASPE does not encompass the most threatened, ecologically valuable and biologically diverse forests types in the country. Only about 10.3% of the entire SNASPE area is actually native forest (1,420,000 ha with 770,000 ha in national parks and 650,000 ha in national reserves). SNASPE doesn't represent many important ecosystems and species. For example, only two of eleven woody plant species in danger of extinction are in a SNASPE area. Only 8.4% of the total area between regions IV and X is protected; not only is this area highly ecologically valuable with some of the most diverse forest ecosystems but it is also highly vulnerable from usage, population density and plantation pressures.<sup>83</sup>

While these government policies are a step in the positive direction they look better on paper than they do in the forest. This policy is an example of the government's unsubstantiated proclamation of its commitment to preservation, while loopholes and lax enforcement allow exploitation to occur and profits to be made by foreign industry owners.

---

<sup>83</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 355-356.

## **f. Future development:**

### **i. Opportunities for plantations industry expansion**

The Auge Exportador of 1995 describes the strengths and weaknesses of all major Chilean export sectors including the forest industry. A description of challenges and growth opportunities for the forestry sector helps to clarify the outlook and goals of the industry. This understanding of the current development pathway is important to forming a valid critique as well as viable alternative paths.

Chile is competitive in the world market because manual labor costs are low and the growth rate of pine is one of the highest in the world, but other countries are not far behind. Although Chile's forest industry sector is one of the largest and most important export producers for the country, it made up barely 2% of the world forest market by 1995. Its two largest companies, Arauco and CMPC stood at 128<sup>th</sup> and 84<sup>th</sup> respectively in the ranking of forest companies in 1995 (first was the U.S. company International Paper, 25 times the size of CMPC).<sup>84</sup>

For continued expansion of the industry, priorities have to include training and higher education of the forest managers and loggers, coordination and cooperation among the forest companies and strong marketing strategy plans. The state could augment the industry further with improved infrastructure and port policies to increase efficiency and decrease the costs of transportation and shipping. In addition to this, since the sale price of the wood depends on the market price, the authors of Auge Exportador encourage world market participation to increase Chile's influence on that market price and fall less subject to its fluctuations. They stress putting forth one single strong message (to investors) from all state sectors involved in export that maintaining a healthy, open,

---

<sup>84</sup> Meller et al. *Auge Exportador Chileno*. 131.

stable economy and promoting economic policies consistent with clear export development goals are the state's priorities.<sup>85</sup>

The role of the state is seen as integral to continued success of the industry. Cooperation between the private sector and the state is very important, as are the economic policies that the state implements. The industry leaders firmly believe that the government must continue supporting them with public money and market freedom. This mentality bolsters the already significant aversion to restricting industry activities in any way. The industry's insistence that it must be accommodated functions as a threat to the state: divestment would occur should the government decide to change its stance. Thus far the government has not hesitated to accommodate these demands and its priorities are in line with those of the industry: a growing economy comes first. The political power of the industry plays an influential role in developing new policies.

Included in their list of opportunities for industrial growth, the authors of the Auge Exportador address the importance of taking a strong initiative on environmental and ecological issues. At this point in the mid 1990s the forest sector was subject to increasing concerns from environmental groups and facing accusations of harmful, irresponsible exploitation. These movements had loud enough voices even under Pinochet's lingering military rule that the forest companies were afraid "green" or ecological groups would completely disable the industry, adversely affecting investment, employment and the economy. The Auge Exportador authors called for a solid, united front from the industries in order to disarm "sentimental, unproven, irrational claims motivated by emotional or political reasons, and supported by competitors."<sup>86</sup> To counter the accusations of ecological irresponsibility and present a concerned, environmentally friendly façade, the forest industry rhetoric has since been: for every tree

---

<sup>85</sup> Meller et al. *Auge Exportador Chileno*. 134.

<sup>86</sup> Meller et al. *Auge Exportador Chileno*. 134.

cut annually they plant four, they plant in degraded areas to help erosion, the plantations absorb carbon from the atmosphere, 18% of Chilean territory is protected wild areas and 16% is protected private land- one of the highest percentages of land designated National Reserves in the world - and 85% of raw material is produced from plantations, thus leaving the natural forest mostly alone. These are cited as reasons enough to ensure continued development and investment. Any counter arguments are considered foolish, irrational, anti-developmental and dismissed as attempts at sabotage from competitors.<sup>87</sup> This defensive attitude toward criticism is not productive; if any of the ecological problems are addressed it must be with openness and cooperation.

In this urgent cry for a stubborn blockade against any environmental criticism are the undertones of a lingering fear of control over the private business sector- and a possible economic downturn. The controversies over environmental impact are rooted in this defensive rhetoric. When environmentalists point out ecological damage and call for change the forestry sector refuses to admit to any harm they may cause out of fear of regulation. The government is content to play along while the sector is booming.

The truth of the ecological impact may lie somewhere in between the cries of the environmentalists and the stubborn denial of the industry, but it is impossible to find a balance and a compromise while the government plays the puppet of industrial whim. Industry and environmentalists stand opposed, brandishing evidence to back their respective claims and no progress is made toward a positive, effective and fair solution. Meanwhile the industry makes its profits but damage is being done to the environment and to people living among the plantations. The government has the obligation to mediate and protect the rights of its citizens as well as its natural landscape; this obligation must be met even if it means industry regulation.

---

<sup>87</sup> Meller et al. *Auge Exportador Chileno*. 134.

## ii. Recognizing legislative weaknesses

Law 701 provided the incentive needed for investment in new plantations and was successful- not only in expanding the industry but also in increasing efficiency and profitability of the process by facilitating investment in technology for improving the quality of the product and shortening the harvest cycles. Since this law there have been some attempts at reform and new legislation, but these are still not strong enough to provide the valuable protection that Chile's ecosystems need in order to survive.

The Project of Recuperation and Protection of Native Forest is a legal entity that proposes policies and technical criteria for utilizing the native forest as an economic resource. Its creation was proposed first in 1992 and has still not been ratified.<sup>88</sup> It includes incentives for management of the native forest and rules to regulate substitution with plantations. It was criticized by private industry and supported by conservationists and scientists.<sup>89</sup>

This and other attempts at progressive changes in forest legislation have been held up for years in congress due to conflicting interests and evidence. The extraordinary delay in the ratification process reflects the complexity and contradictions in the debates surrounding issues of forest management and highlights the unwillingness of the Chilean government to take a strong stance. The lack of consensus is an enormous obstacle to producing an adequate policy. As the law awaits perfection and approval the forest industries may carry on as they please with the government's inaction serving as tacit approval. Meanwhile, "the absence of a legal framework adequate to protect Chilean forests has allowed intense devastation to continue and grow."<sup>90</sup>

---

<sup>88</sup>CORMA. Corporación Chilena de la madera. [http://www.corma.cl/portal/menu/legislacion\\_y\\_normativa](http://www.corma.cl/portal/menu/legislacion_y_normativa). retrieved 12/8/06.

<sup>89</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 336.

<sup>90</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 384.

In 1995 the government debated whether to continue subsidizing the forest industry's initial plantations on eroded soil or whether it was strong enough to continue doing well without incentives. Forest companies pointed out that planting pine or eucalyptus on land not covered by the subsidies (land with higher quality soil) led to higher yields because of the increased volume of production, better quality of the product and faster harvest cycle. This justified paying more for the higher quality land and made the subsidies, which operated only for eroded land, obsolete in many cases.<sup>91</sup> This renders the ecological "recuperation" justification of the subsidies obsolete as well.

Some thought that the new law should bring about a second phase in forest industry growth by creating incentives for businesses to incorporate more productive native forest into the sector and plant new plantations of both native and exotic species in addition to subsidizing forestation in dry, sandy zones.<sup>92</sup> In this proposal the subsidies would go toward any new plantations and even toward increased harvest of the native forest without necessarily any improved regulation to ensure sustainable management. The government continues to promote ecological destruction as long as it is profitable and still contributes public money to subsidize a prosperous industry that could easily stand on its own. Given the drastic wealth disparity in the country and dire need of many of its citizens for public aid, this investment can no longer be justified.

The push for further expansion of this profitable export sector, the maintenance of market freedom and the industry's staunch rhetoric of self-proclaimed sustainability in the face of environmental criticism shaped the forest law of 1998: D.S. 193a. This law pertains to forestation, management, cutting and reforestation. The latter is an obligation, as an attempt to reinvigorate certain areas that have been severely exploited under the D.L. 701. This new law was designed to promote continued growth of current and new

---

<sup>91</sup> Meller et al. *Auge Exportador Chileno*. 125.

<sup>92</sup> Meller et al. *Auge Exportador Chileno*. 125.

plantations, remediate damage already caused (by creating more plantations!) and to try to ensure continued profitability of the sector. This policy reads similar to its predecessors in the eyes of ecologists; the industry is protected and promoted with the feeble justification that it is beneficial to the environment.

Opportunities to improve legislation include funding for enforcement of restrictions on harvesting native forest, promotion and support for research to further determine impacts and need for protection, replacing public subsidies for forest industries with increased funding for forest protection (including expansion and strengthening of SNASPE), more concrete support for Mapuche communities including more political power and more valuable land, and market incentives/sanctions to encourage forest companies to operate in a sustainable manner. After a discussion of ecological and sociocultural impacts, I discuss progressive opportunities in further detail.

#### **IV. Consequences: Who bears the costs?**

- a. Social/cultural impacts on rural and indigenous populations
  - i. Land/livelihood loss
  - ii. Culture/identity loss
  - iii. Rural to urban migration
  - iv. A case study: El Valle de Elicura
- b. Ecological impacts and controversies
  - i. Contradicting evidence examined

##### **a. The Social/cultural impacts on rural and indigenous populations:**

###### **i. Land/livelihood loss**

Pushing for economic growth through exploitation of resources has taken its toll in many ways. In the social realm the Mapuche pay the biggest price of any group for the prolific wood production. This injustice is not a new development; the Mapuche people have suffered loss of their land since the arrival of Spanish settlers and have a long

history of fighting hard to retain it against efforts of the Chilean state to expand into their territory and assimilate them. The Mapuche historically inhabited the area south of the Bío Bío River, retaining their lands even in colonial times through their fierce, successful fighting with the settlers and the Chilean government. This fight is marked by broken treaties, unfulfilled promises and repression on the part of the government and continues today against the primary invader: the forest plantations companies, heavily supported by government policies.

Beginning in the 1860s due to expanding wheat production the Chilean government violated the boundary that then divided Mapuche land from Chilean land, the Bío Bío River. Expansion south into Mapuche territory was dubbed “pacification of Araucanía.”<sup>93</sup> Although many independent Mapuche communities united and fought against this, the government succeeded in forcing them onto reservations and converting their land to agricultural uses. Government incentives designed to avoid economic downturn in the 1930s promoted exploitation of native forest and the beginning of large-scale plantations in the south, and agrarian reform implemented by President Jorge Alessandri (1958-1964) spurred further growth.<sup>94</sup> With the government policies implemented under Pinochet, plantations exploded. What had before been collective land open to all Mapuche was privatized and fences were raised.

Since 1881 the Mapuche have lost 95% of their territory.<sup>95</sup> Salvador Allende returned some land to the Mapuche during his term, leaving them with 565,000 ha of official territory, but in 1973 Pinochet reversed the agrarian and land reform policies causing the Mapuche to lose more than the 129,420.88 ha that Allende had given them.

---

<sup>93</sup> Swords, Alicia C. S. “Envisioning/Enacting Autonomous Landscapes: Mapuche Autonomists and the Neoliberal Property Regime in Chile.” For presentation at Latin American Studies Conference, San Juan Puerto Rico, 3/15/2006. 6.

<sup>94</sup> Samur. “Globalización en tierras Mapuche.” 2.

<sup>95</sup> Cornejo, José Araya. *La invasión de las plantaciones forestales en Chile: Efectos de la actividad forestal en la población indígena Mapuche*. Santiago: Observatoria Latinoamericana de Conflictos Ambientales OLCA, 4/2003. 2.

They are left with 225,000 ha out of 33 million ha of original territory.<sup>96</sup> The majority of expropriated land was privatized and is now in the hands of forest companies.

**ii. Culture/identity loss**

In the remaining Mapuche communities poverty is rampant and opportunities are slim. Surrounded by monoculture plantations of eucalyptus or pine, obtaining the resources from the native forest that make up their traditional way of life and subsistence is impossible. They can no longer depend on the native forest for food, construction materials, cultural and spiritual practices, or medicinal supplies. Due to soil depletion and water contamination and scarcity from plantations damage it is increasingly difficult to grow crops. As they are forced to adapt to such a drastically different environment and system of living, their language, customs and identity are fading into the wider Chilean culture.

This is a case of environmental racism and environmental injustice. The Mapuche are a tiny minority and they bear the costs of forest degradation disproportionately. This inequity is promoted fundamentally by the government itself, whose obligation it is to protect and promote the rights and well being of all individuals in the country. The Mapuche have a strong movement and have been allowed some meager reparations, however it is not nearly enough to compensate for what they have suffered and lost.

Thus far the effectiveness of working within the limits of the law to regain land has been limited and slow. Conflicts have escalated to symbolically burning plantations or equipment, hunger strikes and *tomas*, or taking over of forested land; these have been met by the government with severe consequences including jailed leaders being labeled

---

<sup>96</sup> Samur. "Globalización en tierras Mapuche." 3.

and prosecuted as terrorists for property damage. The government's strategy in dealing with conflict between forest companies and the Mapuche has been to attempt to reduce tension and conflict through revisions in the Indigenous Law, modifying CONADI (National Corporation of Indigenous Development), and buying disputed lands from the official owner to give them to the Mapuche. However, many of the lands that have been regained are degraded and valueless. There is a growing caution about what to ask for since the forest companies are happy to receive money from the state for lands that are no longer useful to them, and the Mapuche receive this land as an appeasement but their situation is not improved. The government contradicts its attempts at cooling the conflict by fiercely prosecuting the leaders accused of terrorism for their activism; through enforcing the current title rights to the land the government fulfills its role as private property protector under the neoliberal scheme.

Discussions of indigenous rights revolve around three themes: terrorism, developmentalism and assimilation.<sup>97</sup> When the Mapuche are confronted with terrorist accusations they respond that working within the system has proven ineffective and demand more rights. The government in turn speaks of their rights to be *developed*, that is their rights to an opportunity to participate in development as a part of Chilean society. The Mapuche point out that they want to do it their way, according to their own traditions, not to follow the government's plan of development and assimilate further into Chilean culture. This leads to the government proposing a participation strategy that opens a discourse for airing grievances but has little or no efficacy in changing the actual situation.

---

<sup>97</sup> Swords, "Envisioning/Enacting Autonomous Landscapes."

The proposed Indigenous Law 19.253 was meant to address these issues and serves as a direct means for granting land and rights to the Mapuche people.<sup>98</sup> A very watered down version of the *Ley indígena* 19.253 was passed in 1993 and its budget and power were diluted further by the neoliberal ideals of lean bureaucracy. The government claims to recognize the importance of the land to the Mapuche culture, and the importance of the Mapuche themselves both intrinsically and as part of the area's cultural heritage. The government professes: "The state has the obligation of promoting the indigenous cultures that form part of the heritage of the Chilean nation."<sup>99</sup> These clearly stated goals- "obligations"- are proclaimed on paper but simultaneously contradicted by the state's concrete actions. The written law sounds progressive but is overshadowed not only by the lack of concrete, serious results from sluggish bureaucracy but also by the concurrent, blatant encouragement the state gives to private investors to conduct enormous projects such as highways, power lines, dams, and of course plantations even through what is currently official Mapuche territory.

### **iii. Rural to urban migration**

Most Mapuche no longer live their traditional subsistence lifestyle. Now that they use currency and participate in the mainstream economic system, employment has become an issue. Educational opportunities for children and youth are poor, post-secondary school opportunities in the rural communities are worse, jobs are nonexistent and the appeal of the city is large. Youth look to the cities for opportunities yet are faced with great obstacles upon arrival. A rural-to-urban migration pattern is the result but seldom does their situation improve in the city. There they face rampant discrimination;

---

<sup>98</sup> Ley Indígena. <http://www.xs4all.nl/~rehue/ley/ley-2.html>, retrieved 12/7/06.

<sup>99</sup> Ley Indígena. <http://www.xs4all.nl/~rehue/ley/ley-2.html>, retrieved 12/7/06.

unemployment or exploitative, subordinate jobs; and few opportunities for education.<sup>100</sup> Poverty, depression and alcoholism rates are high. Only a fraction of the urban Mapuche community is organized; the rest lose their language, identity and culture, struggling to survive in a society that does not welcome them or accommodate their beliefs.<sup>101</sup>

About 10% of Chile's population is indigenous people according to the 1992 census. The greatest percentage of the approximately 1.3 million people who consider themselves indigenous to Chile (almost 90% of which are Mapuche) live in cities, often in the poorest areas.<sup>102</sup> The government has failed to act decisively to prevent and counteract this situation despite its proclaimed obligation to support the indigenous population of its country. Legislation promotes the plantations industry to ensure economic growth above all else. Mapuche rural-to-urban migration is a direct result of lack of fertile land and native forest that they need to survive and maintain their traditional way of life. The Mapuche, "people of the earth" in their own language, bear disproportionately the costs of the unrestrained plantations industry.

#### **iv. A case study: El Valle de Elicura**

The Mapuche are the self-proclaimed people of the earth. Their cultural practices and spiritual beliefs are based entirely on the balance of nature and their relationship to the web of living and non-living beings on the earth. They feel it is their responsibility to respect and maintain this balance. Their mythology revolves around the importance of maintaining equilibrium in the environment and the dire consequences of disrespect and over-exploitation. Their food, medicine, lodging and ritual implements are all found in the native forest; when the native forests disappear they are left with a vacancy in culture,

---

<sup>100</sup> Kilaleo, Fernando. *Mapuche Urbano*. Posting to online resource Mapuche.cl, accessed 4/5/07. <http://www.mapuche.cl/documentos/index.html>. 1992. Document page 7.

<sup>101</sup> Kilaleo, Fernando. *Mapuche Urbano*. Posting to online resource Mapuche.cl, accessed 4/5/07. <http://www.mapuche.cl/documentos/index.html>. 1992. Document page 7.

<sup>102</sup> Swords, "Envisioning/Enacting Autonomous Landscapes." Appendix B: 170.

identity and actual resources for subsistence. The Mapuche rely on the forest for most of their livelihood but they do so in a non-destructive, respectful manner. A sense of responsibility, understanding of close mutual relationships with the earth and its resources and respect for the limitations of the ecosystem is fundamental to the Mapuche identity and way of life. The Mapuche people I interviewed view the current plantations system with scorn, dismay and bitterness.

El Valle de Elicura, a Mapuche community in the VIII region, exists surrounded by hills that were once covered in native forest and now are lined with rows of eucalyptus. The community's struggle to maintain a culture based on resources and circumstances that no longer exist is manifest in the odd combination of stubborn tradition and seeping modernity. Although there is not even phone access, a bus drives by a few times per day that will take a traveler to the nearest large town half an hour away. The rukas, traditional Mapuche houses, only exist in museums or as part of a deliberate effort on the part of a few to incorporate that tradition in their lives. Most houses are small, government-built patchworks of cheap modern styles. Some homes have gardens or even small fields with livestock, but this small-scale agriculture does not provide self-sufficiency. Engagement in the cash economy is necessary but unemployment is the norm. Ironically, some of the few jobs available are working for the plantation companies; one man I met had the job of guarding their equipment during the night from vandalism by members of his own community.

During my stay in this community in May of 2006 I observed the tangible impact that the plantations have on the earth itself: the low water levels in streams and rivers, the withered gardens from depleted soil and lack of water, the changing composition of the lake ecosystem, the persistent smell of burning wood and smoke that stings your eyes if you are outside on a day when they burn after clearcutting. I witnessed the poverty that

the community members face and the way of life they have developed around coping with few options and maintaining what they can of their traditional culture. The community leaders work to provide a Mapuche school in the community center that teaches the language and the values of their culture; children in the community also attend a small Chilean public school. Leaders organize and attend workshops for both Mapuche and others to raise awareness of their current situation and to brainstorm options for change. They maintain their own calendar and celebrate their own festivals, yet for practical reasons must also conform to the calendars and schedules of the country; some still wear the traditional colorful garb but most dress as Chileans do. Their pride is apparent, as is their indignation at the injustice they shoulder.

I attended a forum held to discuss the status of four individuals on hunger strike in opposition to the Mapuche political prisoners being held and charged with terrorism. Frustration and determination were palpable, and the reality of the situation starkly contrasted with the theoretical musings of the CORMA CEO about the rules of supply and demand and the benefits that plantations have for the environment. The industry's dismissal of critical opposition as hysterical and rooted in competitive sabotage rings hollow next to the voices of those who demand, and truly need, change.

### **b. Ecological impacts and controversies:**

The scientific debate over contradictory evidence surrounding ecological impacts of the plantations is difficult to untangle. Despite the uncertainties, it is clear that the continuing expansion of monoculture plantations, especially when replacing native forest, has many serious environmental implications. Environmental sustainability must be a priority not only to protect the environment for its intrinsic value and its many services, but also to promote continued economic growth in a country that relies heavily on extracted primary product exports.

Unchecked rapid development based on maximum possible extraction had and continues to have severe environmental repercussions including destruction of natural forests, soil erosion and desertification, water pollution, water supply reductions and disruption of water cycles. Of the estimated 18.4 million hectares of original native forest covering Regions VII through XI, only about 10.3, or 56%, remain today.<sup>103</sup>

We are learning serious lessons about our dependence on the proper functioning of ecosystems for many different things we take for granted until they are disrupted. The more we understand the complexity and delicacy of these systems, the clearer it becomes how irreplaceable they are. We must understand and respect the functioning of these systems as we increasingly experience the effects of human disturbance on the environment. It is essential that ecological issues involved with uninhibited exploitation of the land are investigated and addressed.

#### **i. Contradicting evidence examined**

According to the CORMA, the plantations help to recuperate degraded land, absorb carbon from the atmosphere to counteract global warming, prevent erosion, and provide a relaxing, green atmosphere for people to enjoy as well as a refuge for wildlife (which they claim is adapting well to the “new type” of forest). These claims and the contradicting views raise many questions about the true ecological effects of the plantations; while there may be a middle ground to be reached it is difficult to know who to believe when faced with such drastically different claims. Based on my own experiences and observations I am inclined to accept evidence from sources that have direct experience with the effects and no economic interests in marketing a sustainable image.

---

<sup>103</sup> Neira et al. *Global Forest Watch Chile*. 16.

The government and the forest companies claim that the majority of plantations were established on poor, eroded soil and rejuvenated much of the land they occupy turning it from barren to productive. According to one government source about half of the plantations were established on surfaces with severe to very severe erosion, while only 3%-6% of total planted area replaced native forest.<sup>104</sup> This and their claim that the plantations reduce pressure on native forests are two primary arguments against ecological criticisms of the plantation systems. ♦

Government subsidies apply when new plantations are created on “eroded land” to recuperate what was once agricultural or pasture land and is now exposed and vulnerable to erosion. Planting trees there, they say, helps prevent erosion and increases green vegetation. However the life cycle of the plantations includes rapid growth, cutting, burning, and then replanting as well as continual clearing of any underbrush. In between harvest and replanting the ground is bare and vulnerable to erosion. Even when the trees are there growing the shallow roots of the exotic pine and eucalyptus species do little to hold the soil. If left alone, many eroded and degraded areas would develop a natural plant coverage that would be far more effective at maintaining the soil. Plantations advocates state that the needles of pine trees are good for rainwater dispersion, capturing it then letting it down slowly which prevents rushes of water that would wash away the soil. Natural forest does this far more effectively.

Clearing all underbrush and non-plantation species from the site also takes away the nutrient-providing organic material that normally would decay and maintain a healthy rich soil. This natural cycle of replenishing nutrients in the soil is eliminated with cutting, clearing and burning; soil is easily depleted after a few harvests making it more

---

<sup>104</sup> Meller et al. *Auge Exportador Chileno*. 123.

♦ I address opposing claims about plantations’ effects on the environment and the scientific debate surrounding the ecological implications of the plantations and the native forest in section III b.

likely that the plantations industry will abandon the exhausted site and plant in other areas. This increases the overall amount of depleted, exposed terrain and exacerbates erosion problems.

Both pine and eucalyptus each consume an enormous quantity of water to support their rapid growth cycle. Water levels and rainfall have declined noticeably in many areas of southern Chile covered by plantations. Pollutant runoff has also changed nearby larger bodies of water; increasing nitrogen and phosphorus concentrations as well as pesticide deposits in lakes that has brought about the proliferation of algae and caused a forced migration of certain endangered species, such as the black-neck swan.

The CORMA's claim that the plantations provide a green, relaxing place for people to stroll around and enjoy is utterly untrue; plantations are off-limits to anyone but workers. Strict rows of identical trees enclosed by barbed wire fencing are far from welcoming and hardly green. Biodiversity in a monoculture plantation is an empty rhetoric. Both pine and eucalyptus plantations form corridors with nothing growing or "finding refuge" amongst them. Most wildlife can not adapt to monoculture plantations, except for pests and pathogens, rather they retreat to diminishing and fragmented areas of native forest for their habitat where the natural food chain functions and diverse vegetation provides refuge.

One hectare of pine or eucalyptus plantations absorbs nine tons of carbon dioxide per year from the atmosphere, a rate that according to the CORMA is higher than old-growth forest absorption. According to the authors of Forest Watch Chile, however, the carbon absorption of native frontier forests is actually the highest,<sup>105</sup> yet another contradiction. The industry offers this figure as evidence that the plantations are helping to reduce global warming. However, the industries substantially offset any contribution

---

<sup>105</sup> Neira et al. *Global Forest Watch Chile*.16.

to carbon absorption the plantations have when they burn the hills after harvesting the trees, filling the air with smoke that has neither native forest nor plantations to absorb it. Another slogan the industry is fond of is “For every tree we cut, we plant four.” But planting more rows of exotic species does not help; what is needed is the preservation and restoration of diverse native forest.

The claims of the plantations companies are a shrewd business image promotion in the face of growing environmental criticisms and a calculated reaction based on economic interests and fear of increased regulation. The association of forest companies presents this list of environmental benefits in all of its propaganda as an attempt to head off criticism and paint as radical and irrational any claims or evidence that the plantations are doing harm. Suggestions that the soil and the water supply cannot sustain such rapid growth cycles are dismissed as anti-developmental and suspiciously accused of being founded by competitors’ interests. Reaction to criticism is defensiveness rather than openness and innovation.

The companies also dismiss their other primary critics- rural Chileans and Mapuche people who live directly among the plantations and do not benefit from the wealth of their production. These people know the land and water where they have lived for generations and can recognize when the cycles are seriously disturbed. They warn of the serious damage to ecosystems these plantations are causing, but lack of respect for their wisdom and quality of life and a looming fear of regulation override words of caution and the push for growth rolls forward. The forest industry actually blames the victims of its exploitation, claiming that degradation is primarily due to agricultural overuse and deforestation by poor communities that rely on forest resources for fuel.<sup>106</sup>

---

<sup>106</sup> Carte, Dr. Fernando Hatwig. *La Tierra que Recuperamos*. Santiago de Chile: Los Andes, 1994. Prologue.

Government believes the statements that most serve its interest: the fertile Chilean land is ideal for this kind of industry; there is no reason why things can't carry on as they are. They cling to the economic rationalism theory: as long as the economy is strong, everything else will fall into place.<sup>107</sup> This stubborn naiveté and simplification of the situation have serious negative impacts on the environment, on many Chilean citizens and on the Mapuche people. Government leaders must leave behind the fear of economic downturn and open their minds to the possibility of a different way that does not overlook the well being of all people living in the country or the limitations of its rich ecosystems. It is time to trust that responsible government intervention and regulation of exploitation based on good humanitarian and environmental values and priorities can ensure people's quality of life as well as both ecological and economic sustainability.

## **V. Alternatives**

- a. Concrete paths to change
  - i. Redistribution of power
  - ii. Scientific criteria
  - iii. Redistribution of public funding
  - iv. Government commitment to promoting Mapuche welfare
  - v. Government commitment to ecological preservation
  - vi. Increased monitoring and regulation of industry
  - vii. Market solutions
  - viii. Education
  - ix. Democratic/Grassroots organization
- b. Policy and ecological criteria for improved forest management

Chile's natural resources are important for its development and wealth and should not be left untouched but rather managed carefully. Plantations would be acceptable in practice if managed with environmental responsibility, proper monitoring and on a

---

<sup>107</sup> Dryzek. *The Politics of the Earth*. 121-144.

reasonable scale. Of course different values determine how much responsibility is enough, whether or not incentives for proper management and punishments for irresponsibility are necessary and what size scale is reasonable. Values of production and profits translate to lower priorities of responsibility and monitoring with promotion of planting and harvesting on the largest possible scale; values of preservation and conservation prioritize strong, specific regulations and smaller scale plantations.

The current values of the Chilean government are to promote the economy and production as much as possible, resulting in huge-scale industries with low accountability and low responsibility. This combined with the industry's fear of environmental criticism and possible regulation creates a defensive rhetoric labeling all environmental critiques as radical, conspiratorial attempts to sabotage economic progress. The industries promote a sustainable image but do whatever is most productive and cost-efficient in the short term. They fail to address legitimate concerns about the sustainability (both ecological and economic sustainability) of their industry practices. Government policies must force the industry to live up to its self-promoted image, recognize legitimate environmental issues and cooperate to work toward solving them.

**a. Concrete paths to change:**

“Changes in livelihoods coupled with specific controls over development (where value from [production] goes, how industrial [plantation] locations are decided) may yield very different and more progressive outcomes.”<sup>108</sup>

There is no simple solution. There are, however, many possible structural and policy changes that could add up to a more just and sustainable development formula. I have challenged the current conditions and demonstrated the importance of figuring out this formula. Better environmental management and social justice must be accomplished

---

<sup>108</sup> Robbins. *Political Ecology*. 189.

by a combination of democratic organization and government initiative, which must reflect a change in priorities. Positive steps could include a redistribution of power and its relationship to information, a criteria of “degradation” based on concrete science and good values, redistribution of public funding, government commitment and action to promote Mapuche welfare and ecological preservation, increased capacity and commitment by the state to monitor and regulate industry, possible market solutions for industry regulations, ecocertification, education, democratic organization, and grassroots organization.

A redistribution of power is essential for various reasons. Power to monitor and regulate plantations could be shifted from the state to the local level. This could bring about more control in individual areas over how many hectares of plantations can be hosted as well as who owns them, manages them and profits from them. More power at the local level would also help decide on the best conservation strategy for a specific region based on its unique factors. This must be implemented with caution, however, given the possibility that those in power at local levels may also have a vested interest in plantation development.

Power is also a gatekeeper for determining what values policy is based on and deciding which sources of information are valid. The dominance of western-scientific thought validates quantitative, aggregate data as legitimate knowledge, and discounts other forms of wisdom. Power to choose standards for what constitutes degradation depends on whose interests are prioritized; the plantations industry has an interest in promoting its image as sustainable and ecologically healthy and uses its economic power to spout a particularly self-interested message. The government may choose to accept this information over other sources to avoid dealing with contradictory evidence and imposing strong checks on the industry. If the state were to truly prioritize the country’s

people and land, information from different sources would be accepted as valid and the government would invest in unbiased research.

Many of the scientific debates can only be resolved by more research backed by funding that is not tied to industry interests. Further research is essential to establishing solid criteria of what constitutes degradation. There really is no objective way of choosing standards. As Robbins states, determining this is “a political choice, [and] depends on the purpose and concerns of researchers.”<sup>109</sup> Deciding what to call damage and what constitutes progress is inevitably based on values, which I argue must include primarily human rights, ecological preservation and equitable progress.

According to Robbins, there are four possible criteria for determining degradation. The first is loss of natural productivity, which is complicated to measure and again dependent on longitudinal and statistical research. A second measure is loss of biodiversity, which is also complex because it is difficult to measure, monitor and prove. In this situation however it is a simple fact that a monoculture plantation is, by definition, far less diverse than native forest. A third standard to go by is loss of usefulness. But the question is what kind of usefulness, for whom, and when? The answers to these questions depend on politics and power; in this case the plantations have one use: production of wood for sale to foreign markets (a second use could be the creation of some jobs; however given the poor work conditions and abysmal workers’ rights this could well be considered a loss). The forest companies’ claim that one of the largest benefits of the plantations is to make wood available in numerous products to improve quality of life.<sup>110</sup> Examining whose quality of life is improved and whose is lowered reveals inequality and injustice. The tradeoff is too imbalanced to justify: native forest and biodiversity, ecosystem services, sustenance and culture of indigenous people, and

---

<sup>109</sup> Robbins. *Political Ecology*. 92.

<sup>110</sup> Carte. *La Tierra que Recuperamos*. Prologue.

healthy water and soil are compromised for private plantations that only have economic value. There is an overall loss of usefulness and both the profits and the losses are unequally distributed: those who depend on the native forest, who have the least political and economic power, are those who lose. It is the government's responsibility to invest in unbiased research that will clarify evidence and establish standards. Despite the complexity of these four criteria, however, it is clear from at least three that the land is being degraded and the costs and benefits are unevenly distributed.<sup>111</sup>

If the government is to invest in research it will require a redistribution of public funding. Abolishing the 75% subsidy for initial plantations investment would allow for a better allocation of public money toward social and environmental causes. These could include conservation efforts, human rights programs, research, regulation and enforcement of industrial compliance with environmental standards, and compensation for those who lose in the tradeoff (including land, money and support). Along with this must come the government's commitment to promoting Mapuche welfare and ecological preservation; both must be backed up with action and funding. To act on its commitment the government must live up to its written proclamations valuing the indigenous people of Chile and demonstrate its respect by upholding promises, sharing power in negotiations, taking issues seriously, understanding the need for productive land in order for their culture to survive, recognizing and addressing the impacts the plantations have on their way of life, and, most importantly, working with them toward development on their terms.

Environmental conservation presents problems in the face of Mapuche land claims. Addressing the need for ecological preservation and improving SNASPE would involve encompassing a great deal of native forest in the protected park areas to prevent

---

<sup>111</sup> Robbins. *Political Ecology*. 91.

logging and replacement with plantations. But this does not incorporate indigenous rights and access to the land, as the Mapuche would be unable to rely on this forest. Unless there was a stipulation that the Mapuche have exclusive rights to access the forests for their traditional uses, conservation does not improve their situation. That condition is problematic. Mapuche philosophy professes a fundamental commitment to maintaining balance and equilibrium but there is no proof that they never cause degradation. Perhaps even so they should be allowed access. Given their history of deprivation they may have the right to their lifestyle no matter the effects it has on the forest. Undoubtedly whatever impact they may have can't compare to the devastation that massive plantation industries cause.

Another solution, and the one the Mapuche demand above all, would be to grant them a large region of native forest. However, the "settlement of land claims is not straightforward, and is highly political."<sup>112</sup> Allende attempted this during his brief period as president, but redistribution of land from private landowners was highly controversial and was one of the biggest issues that divided the country and brought about the military coup. Given the history of this issue in Chile, this appeasement is unlikely to be a workable solution. Small settlements are made even now, however the land is often valueless and an insignificant size. There is a need for more innovative, democratic conservation.

The government must overcome certain barriers to industry regulation, including fear of economic downturn and the power of forest companies to directly influence policy. The state must set limits, enforce restrictions, and tighten legislation. In some ways this means compromising from the hard line free market paradigm, and for good reason. As Hardoy says, the government plays a role in decreasing the vulnerability of

---

<sup>112</sup> Robbins. *Political Ecology*. 165.

the poor, which often means regulation of industry, which can translate into higher costs for “powerful vested interests.”<sup>113</sup> According to Hardoy, quality government stops enterprises from transferring environmental costs to citizens and ensures that everyone has basic health and safety.<sup>114</sup>

Possible ways to regulate within the current economic system is to place a monetized value on the environment and its degradation through market-based incentives for more sustainable practices. For example, stipulations could be made that degradation would carry a large fine, or the industry could be taxed depending on the size of the plantation, with the taxes being adjusted incrementally to establish that the optimal size for limited negative environmental impact is also the most profitable. In this way the regulations are not in conflict with economic growth and are more in harmony with social and environmental justice and ecological responsibility. Another market regulation possibility is ecocertification, which would rely on consumers to discriminate when purchasing wood and wood products based on the environmental practices of the company that produced the wood. This has proven effective in some cases where governments mandated ecocertification for any wood products that enter the country. The validity of the certification depends on an independent party to monitor practices and impacts, and to hold forest plantation companies to a high ecological standard.

Finally, three related essential components of enacting change are education, democratic organization and grassroots movements. Education about the ecological value of Chile’s native forests and the degree of existing social inequality are most important. Education about Chile’s economy, governmental structure and history tie together the causes of degradation and inequality and can inspire action. The government is technically democratic and is therefore accountable to the votes of its citizens. As

---

<sup>113</sup> Hardoy, Jorge E., Diana Mitlin and David Satterthwaite. *Environmental Problems in an Urbanizing World*. London: Earthscan Publications Ltd., 2001. Chapter 4.

<sup>114</sup> Hardoy. *Environmental Problems*. Chapter 4.

Barbara Lynch puts it, responsible environmental governance is not possible without democratic space; citizens must hold the government responsible.<sup>115</sup> Their voices and votes must be a powerful agent for positive change. The government must carry out both regulations and enforcement, but public awareness and mobilization to vote are essential for the democracy to function. The government must be held accountable to the people who live in Chile to make their well-being a priority.

Grassroots organizations are one of the catalysts for change and begin by raising public awareness. Mapuche and other indigenous social movements are strong in Chile, and collaborate to play an important role in working toward justice. Still, the government has yet to work with them in a meaningful, respectful way and the results of both direct action and legal negotiations have thus far been limited.

#### **b. Policy and ecological criteria for improved forest management:**

Ensuring species survival and maintaining and valuing traditional cultures intimately connected with the forest depends on taking further steps toward better management. To preserve even a fraction of the rich biodiversity in the Chilean forest ecosystems a stricter approach to forest management is essential. This management must be effective at preserving multiple ecosystem attributes and functions including genetic variability, habitat and food source for herbivores and pollinators of forest plants, systems with regenerative capacity and those with unique high-growth-rate tree species, regulation of hydrological balance and water quality, and protection of the nutrient cycle to ensure productivity.<sup>116</sup>

Basic ecological criteria should include the following. Large-scale clearcutting must be eliminated to allow for species regeneration and to reduce erosion. If standing

---

<sup>115</sup> Lynch, Barbara. "Where We Make a Difference." Environmental Aspects of International Planning: Lecture 11/20/2006, Cornell University.

<sup>116</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 412.

and fallen dead trees as well as some live trees are kept then birds and invertebrates will have a habitat. Stumps should remain as well for certain species to accelerate regeneration. There can be no burning and clearing organic debris from sites that have been harvested so that the nutrient base can recuperate from the decaying matter.<sup>117</sup> More forest reserves must be established in critical areas and there must be an effort made to restore degraded ecosystems and connect sections of forest with corridors. This would decrease fragmentation and extend the territory of mammals that require a large range and maintain a greater biodiversity in a heterogeneous environment and reduce pest impacts on productive forests.<sup>118</sup> Even if SNASPE was expanded to encompass more area, the strength of its protection and enforcement of this protection must also be improved, accounting for Mapuche rights.<sup>119</sup>

Many current protected areas are still threatened by hydroelectric projects, mining, irrigation and other public works. The government must account for its valuable natural resources when planning development and land use. There must be monitoring of endangered species' status and recuperation programs must be implemented to support native trees valuable for their wood quality and rapid growth rate. Each unique forest type must have its own specific management policy and there must be a balance struck between exploitation of exotic monoculture plantations and native forest.<sup>120</sup> It would be wise to learn from the indigenous cultures of Chile, for “the wisdom and traditions of human communities linked to the native forest can contribute important elements to the policy and design of sustainable forest management.”<sup>121</sup>

---

<sup>117</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 413.

<sup>118</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 413.

<sup>119</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 356- 357.

<sup>120</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 407.

<sup>121</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 408.

## **V. Conclusions**

Current practices could be continued, including expansion of plantations and deterioration of native forest from degradation, extraction, substitution, introduction of livestock to regenerating areas, and forest fires.<sup>122</sup> Current legislation that prohibits exploitation of a few endangered species might save them. Some native forest would probably survive around riverbanks, estuaries and inaccessible areas. Pests that affect young plantations could be partially controlled but never eradicated. Expensive artificial fertilizers can partially ameliorate soil depletion from overexploitation. Market unpredictability could change everything in the industry.<sup>123</sup> This is the most optimistic outlook if current management and enforcement continuing along the same trajectory.

This scenario is not inevitable. Native forest can be managed properly to become a valuable resource along with plantations, but major changes in practices and scale must occur first. A strong new forest policy that supports the proper management of native forest as much as the government subsidizes plantations is essential. Plantations can make up part of the forest industry but expansion of these should be a small percentage compared to efforts to expand, recuperate and protect diverse native forests. Application of the policy must be extended to small landowners to benefit more than just business giants.<sup>124</sup> Authorities must take initiative to manage and recuperate native forest as well as promote conservation and improve SNASPE. Industry, citizens, universities and government must all cooperate to enact these important measures. Research is vital to keep track of the status of many vulnerable areas and the progress of plantation and

---

<sup>122</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 384.

<sup>123</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 385.

<sup>124</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 386.

native forest development, and value beyond economic worth must be recognized in the forests.<sup>125</sup>

Inevitably, questioning the power relationships and influences that the political economy has on the impacts of extractive industry creates more questions than it answers. Clearly there is no single solution. But asking the questions: who benefits, who loses, and why, is an important part of addressing the inequality that results from, and is propagated by, the current system. To begin to answer these questions we must understand the nature of change: slow and often unpredictable, but possible with patience, humanitarian values, open minds and the capacity to learn and adjust as the situation evolves.

Chile has many valuable natural resources and should take advantage of them to promote its development and economy. But the government has yet to find a way that allows this to occur without placing the burdens and costs of production heavily on an already severely disadvantaged segment of its population and without ruining future prospects of exploitation or destroying the intrinsically valuable rich ecosystems that host the country. There is a need for strong leadership within the government to balance the conflicting priorities placed upon it so that cultural, social and environmental sustainability are prioritized as much as economic growth. The fear founded in a tumultuous history of economic and political problems must be placed aside and the influence of the forest industry must be tempered in order to open minds to alternatives.

Plantations could be managed on a smaller scale, with respect for the functions and limitations of the ecosystems that host them and recognition of the impacts on certain groups along with sincere attempts to address the issues. There must be means of control in place so that what is taken is limited and fully paid for, and those who it is taken from

---

<sup>125</sup> Armesto et al. *Ecología de los bosques nativos de Chile*. 386.

are fairly compensated. Chile must look to its own people and devise a way to promote equitable growth and investment within the country before spending vast public funds to attract wealthy foreign business owners. Providing economic support to encourage local, small-landowner native forest and plantations management is one promising possibility.

Since I am not optimistic that any radical structural change is feasible given the country's history and current entrenchment in neoliberalism, these are the least disruptive, most effective measures to take given the circumstances. A combination of the ideas discussed previously would allow for significant change to occur within the existing structure, while still moving beyond the current framework to responsible use of this resource. The first steps are looking beyond a utilitarian point of view to other valuations of the native forests and prioritizing the rights and well-being of all people in the country.