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# The impact of the Decree Law 701 on the timber plantations dynamics in the southern Chile observed by remote sensing.

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## 1. A NATIONAL REFORESTATION POLICY TO FACE WITH THE EROSION RISK

### 1.1. A CONTINUOUS DEFORESTATION SINCE THE 19<sup>TH</sup> CENTURY: ENVIRONMENTAL AND SOCIAL IMPACTS

The capacitation of the lands for agriculture and cattle breeding has been a practice very widespread during the 19<sup>th</sup> century and in the first half of the 20<sup>th</sup> century and caused, particularly by an intensive exploitation of wheat, a progressive process of soil erosion. Added to that an irrational management of lands and pasture, the whole factors would have caused the erosion of about 19 million hectares, affecting directly the productive capacity of concerned regions.

### 1.2 THE PROMULGATION OF THE GOVERNMENT DECREE 701 (1974)

The first alarming evaluations of the soil state and the erosion in the sixties forces the State to set up a strategy of soil protection favouring the development of monoculture plantations. The arrival of Pinochet to power in 1973, together with the promulgation of the government Decree Law 701 (D.L. 701), marks the beginning of the neoliberal economic phase and the explosion in the forestry sector.

#### 1.2.1. INCENTIVE FOR REFORESTATION BUT IMPOVERISHMENT OF THE VARIETY OF FOREST

This government decree encourages afforestation on land suitability forest, devoid of tree cover and in most cases highly eroded. It permitted to subsidize 75% to 90% of the plantation cost and to exempt tax from the plantations made on these lands (Barrué-Pastor, 2004). This trend monospecificity tree is the source of many environmental disturbances (loss of biodiversity, soil acidification, etc.)

#### 1.2.2. INCREASE OF FOREST HERITAGE BUT GENERATION OF CONFLICTS AT REGIONAL SCALE

For social, economic and technological reason, this incentive has been assimilated by medium and large landowners, and left margins of the profit smallholders. The figure 1 shows the effect caused by the D.L. 701 and its update on the area of exotic plantations between 1995 and 2007. The compensation was an increase in conflicts on land (expulsions, detentions, murders, arsons, etc.)

## 2. MONITORING AND IMPACT OF THE GOVERNMENT DECREE LAW 701 AT LOCAL SCALE

Interactions are multifaceted processes between the legislative framework and environmental dynamics which are captured by remote sensing.

Situated in the north-east Region of lakes (73° 47' and 73° 18'' - western longitude and 40° 14' and 40° 44''- southern latitude), the study area is one of the 25 hotspot for conservation and biodiversity (Myers, 2000). According to the National Institute of Statistics (INE, 2002), more than 89% of the population live in the countryside (7,929 habitants). 62% of this population is represented by native people "mapuche-huilliche".

### 2.1 MONITORING OF THE FORESTRY DYNAMICS USING REMOTE SENSING

Three landsat images have been chosen in 1986, 1999 and 2008. The result of the multi-temporal supervised classifications permits to quantify and to locate the dynamics of land use at the local level. Even if the native forest recedes, it dominates the landscape with 110,775 ha in 1986 (71%), 104,322 ha in 1999 (68%) and 96,857 ha in 2008 (63%). The second growth forests, grasslands, shrublands and bare land (called "other") show an increase of 44% between 1986 and 1999. Timber plantations present the largest increase with 95% covering almost 10,000 ha in 2008.

### 2.1.2. CHANGE TRAJECTORIES OF LAND COVER TYPES

But the main change observed is the conversion of 12,700 ha from native forest to “other” (12% of deforestation) between 1986 and 1999; whereas, for the same period, timber plantations regained 1,483 ha from native forest (1% of substitution) and 2,329 ha from “other” (5%). Then, from 1999 to 2008, the substitution process is increasing for the last two categories respectively (1,883 ha and 3,803 ha); a phenomenon also observed by Cristian Echeverria et al. (2006).

### 2.2. THE IMPACT AND UPDATES OF “THE D.L. 701” ON THE DIFFERENT OWNERS

The initial objective was to promote the creation of a new law which permits the promotion of timber plantations. Therefore, in 1998, the first updating of the government D.L. 701 showed a new reasoning in the plantations’ dynamics: the rural smallholders increased their wooded areas with eucalyptus but in a very low ratio, while the land concentration and capitalization intensified in favour of very important owners.

Treatment results of satellite images fully confirm this trend which is continuing in 2008 with the confirmation of the concentration in the hands of large landowners.

The last updating from 1<sup>st</sup> January of 2011 encourages, the native communities to afforest their lands.

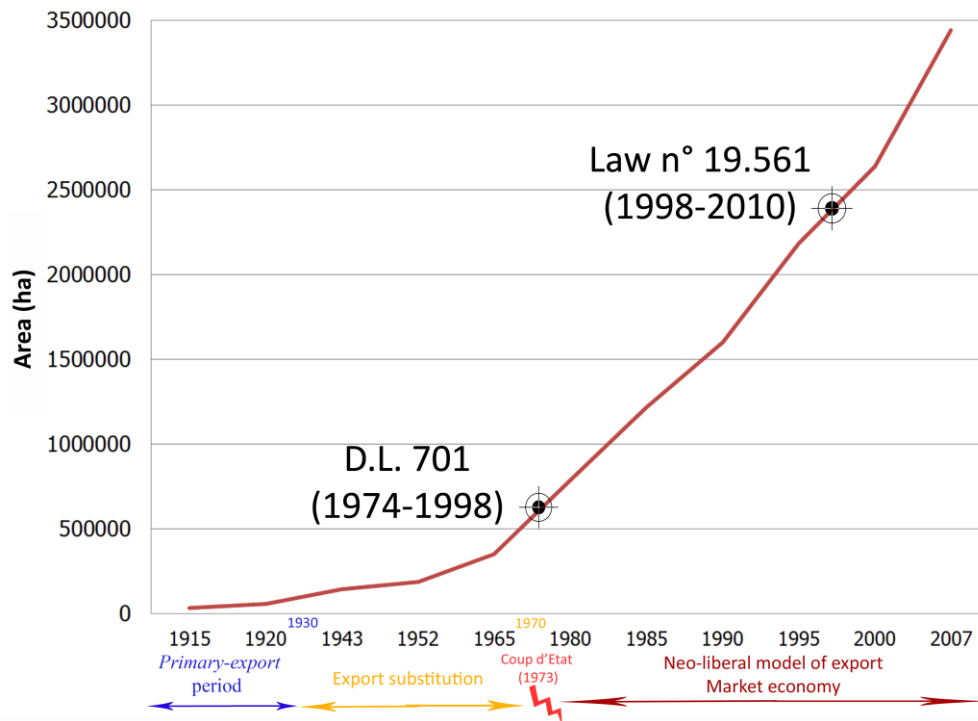


Figure 1. Evolution of exotic plantations (1915-2007) and political and legislative framework

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