

# Study of private forest in Dolhasca district

Identification of management schemes and rent-  
seeking practices

**Tutors:**

Lecturer PhD. Liviu NICHIFOREL

Lecturer PhD. Ionuț BARNOAIEA

**Internship student:**

Margot COUVENT MAURIN

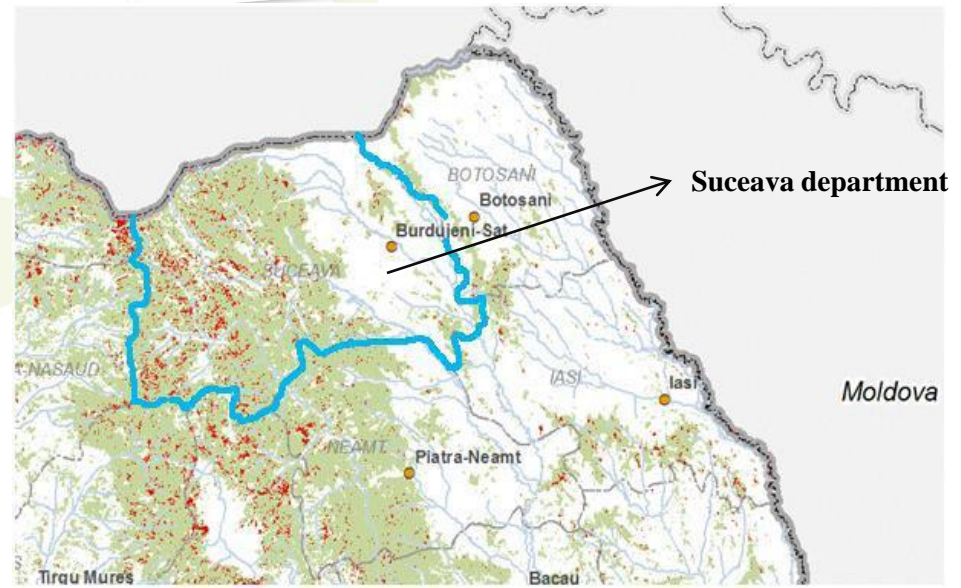
# 1. The starting point

The striking extent of the red color, which symbolizes the deforested areas, has captured media's attention where newspapers headlines proclaimed "Three hectares of forest per hour disappear in Romania..."

The cover loss was considered in any area over 1 ha where the forest changed to a non-forest land use or was significantly fragmented, regardless of the cause: *logging, agriculture and pasture extension, fires, building, natural damages*

-a degradation or loss of *3.4% of the Romanian forest area in ten years*, mostly in the Carpathian area where forest is predominantly situated.

**GREENPEACE**



## 2. Research objectives

○ Determining economic value up-to-date resulting from the management of forests restituted to L18/1991.

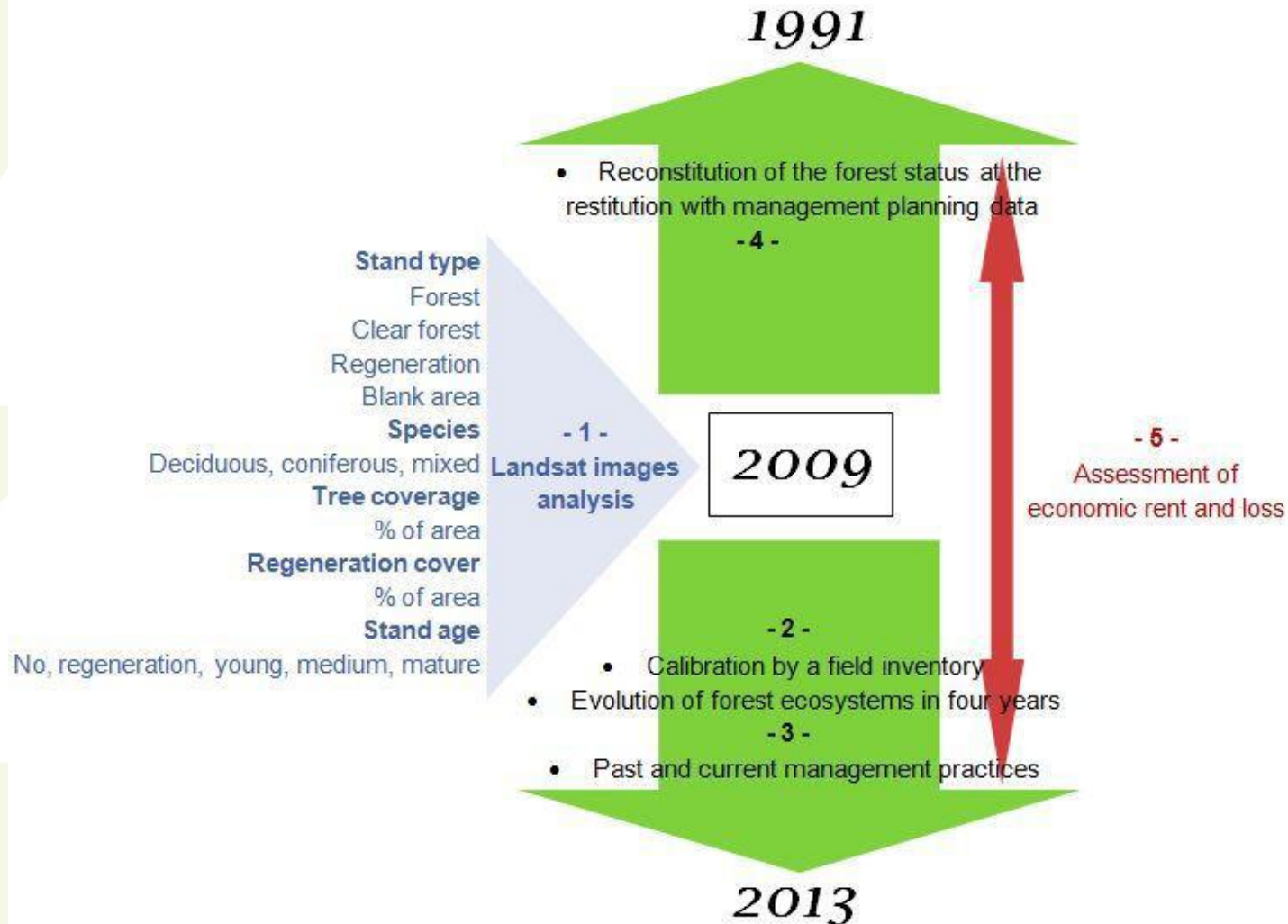
○ **O1:** identifying the effects of different rent-seeking behaviors on the management of forest at the scale of the country :

- *remote sensing tools*- structural patterns of management in private forests
- *sociologic tools*- establish a typology of management attitudes of the owners according to these patterns

○ **O2:** identification of rent-seeking behaviors that influence market transaction and forest management evolution );

○ **O3:** *methodological level* -identify the institutional context that lead to rent-seeking behaviors which generate entropic disturbances of forest ecosystems and explain how changes in property right affect forest management practices

### 3. Methodology



## 4. Results and comparison between the different restitution laws (Landsat images)

**Total private forest area by restitution law (ha)**

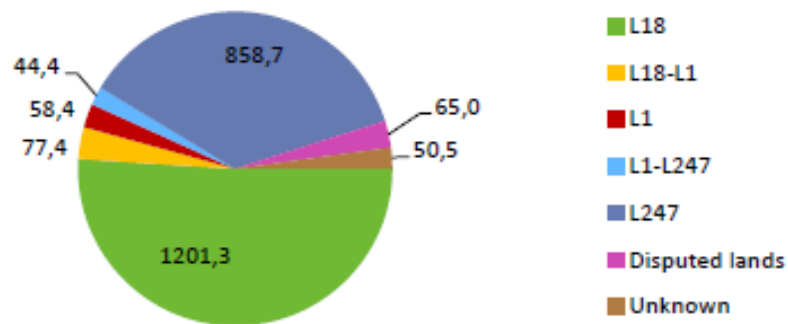


Figure 9 – Graph of total private forest area by restitution law

**Distribution of stands types by restitution law**

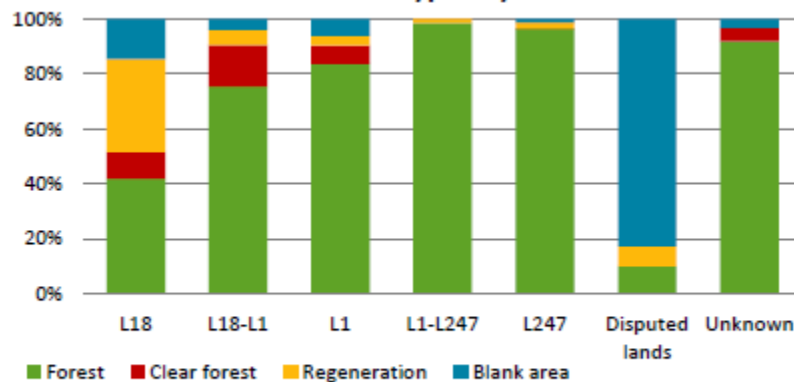


Figure 10 - Graph of distribution of stands types by restitution law

**Distribution of tree coverage by restitution law**

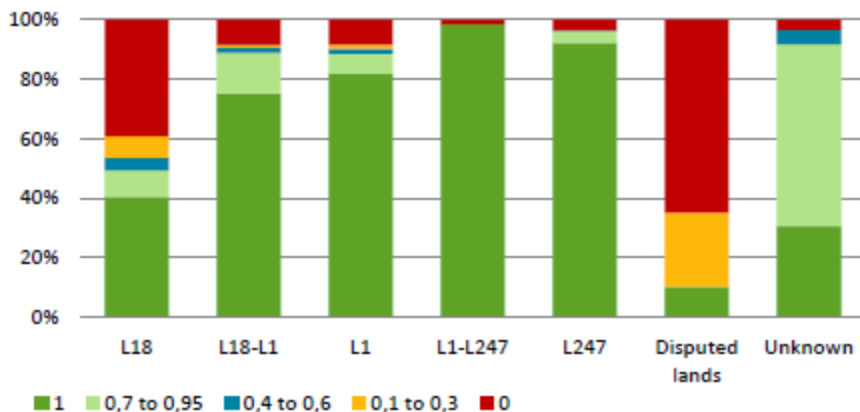


Figure 11 - Graph of distribution or tree coverage by restitution law

**Distribution of forest cover within the total private forest area**

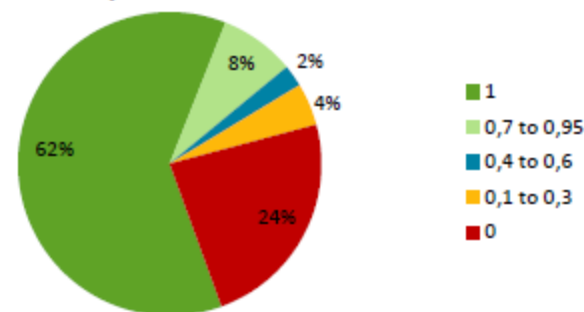


Figure 12 - Graph of distribution of forest cover within the total private forest area

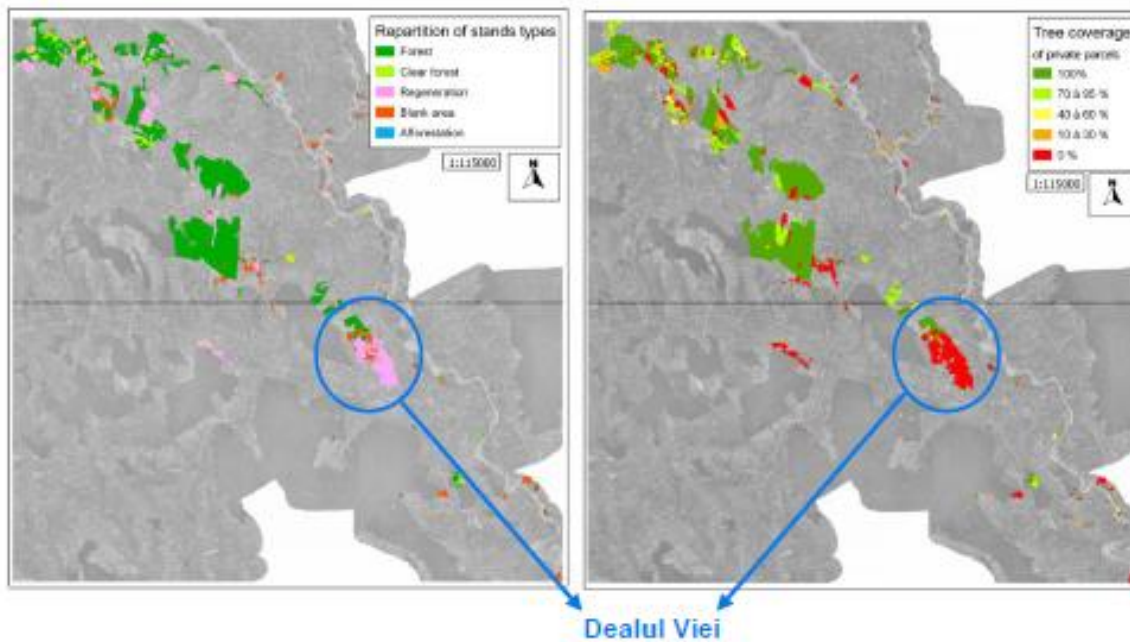


Figure 13 – Parallel between stands types and tree cover status in Dealul Viei in 2009

## 4. Results and comparison between the different restitution laws

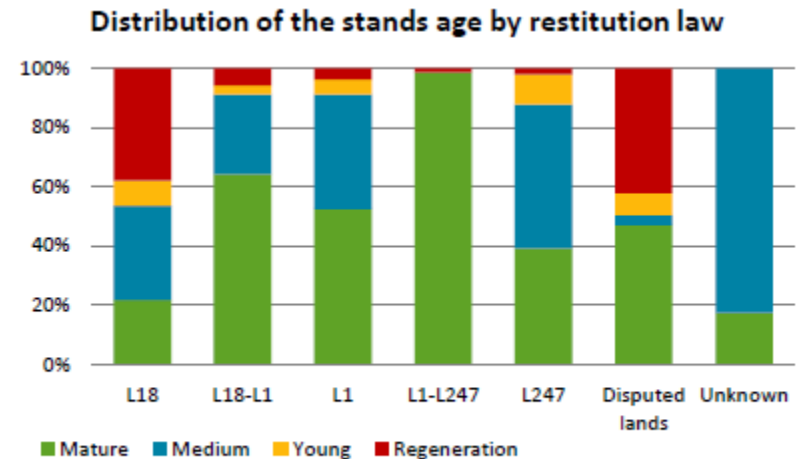


Figure 14 - Graph of distribution of stands age by restitution law

### Distribution of the different land types identified on satellite pictures (2009) and on the field (2013)

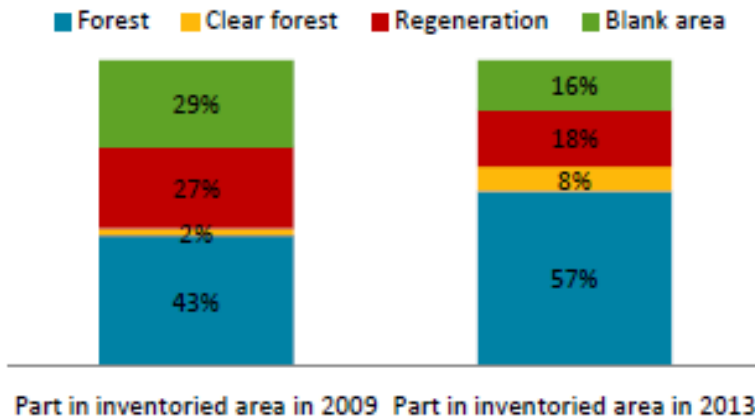


Figure 15 - Graph of comparison of stands types in 2009 and 2013

## 5. Calibration by field inventory

### Origin of the differences of stands types between images analysis (2009) and field inventory (2013) in % of the inventoried area

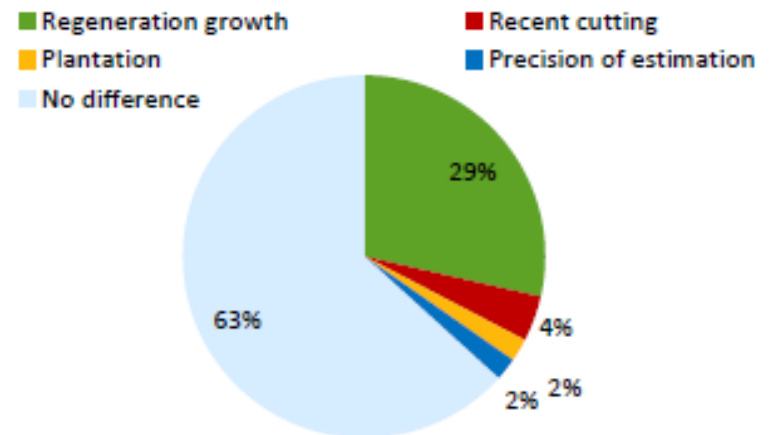


Figure 16 - Origin of the differences of stands types between 2009 and 2013

## 5. Calibration by field an inventory

Example:

- we can see the difference between what is observed on the satellite picture from 2009 and the observed vegetation in 2013:



Figure 17 - Comparison of regeneration status on satellite image of 2009 and pictures on the field of 2013



## 6. Assessment of the economic rent from the forest

### Assessment of the harvestes volumes

*Volume comparison between the scenarios*

|  | Scenario 0   | Scenario 1                                   | Scenario 2 | Scenario 3 | Scenario 4 |
|--|--------------|--|------------|------------|------------|
| Total harvested volume (m <sup>3</sup> )                         | 12 536       | 54 509                                       | 62 116     | 79 932     | 97 748     |
| Year of harvest  | 2004<br>2014 | 2004 and 2014,<br>annual growth<br>each year | 1994       | 2004       | 2014       |
| Difference with legal possible volume (m <sup>3</sup> )          | 0            | 41 973                                       | 49 580     | 67 397     | 85 213     |
| Average harvested volume by hectare (m <sup>3</sup> /ha)         | 56           | 244  | 278        | 358        | 437        |
| Average annual harvested volume (m <sup>3</sup> /ha/yr)          | 2.44         | 10.60  | 12.08      | 15.55      | 19.02      |
| Harvest intensity in % of the capital<br>the year of the harvest | 7%           | 36%  | 99%        | 99%        | 98%        |

**Figure 29 - Estimation of the harvested volumes for different scenarios - Table of figures**

|  | Scenario 0   | Scenario 1                                  | Scenario 2 | Scenario 3 | Scenario 4 |
|--|--------------|---|------------|------------|------------|
| Total harvested volume (m <sup>3</sup> )           | 12 536       | 54 509                                      | 62 116     | 79 932     | 97 748     |
| Year of harvest                                    | 2004<br>2014 | 2004 and 2014<br>annual growth<br>each year | 1994       | 2004       | 2014       |
| Unit wood price (USD/m <sup>3</sup> )              | 25/45        | 5/25/45                                     | 5          | 25         | 45         |
| Total value  | 436915       | 1741734                                     | 310579     | 1998305    | 4398681    |
| Capitalization rate                                | 5%           | 5%  | 5%         | 5%         | 5%         |
| Actualized value in 2014                           | 536898       | 2580864                                     | 824060     | 3255028    | 4 398681   |
| Difference with legal scenario                     | 0            | 2043966                                     | 287162     | 2 718130   | 3 861783   |
| Additional benefits<br>compared with legal removal | 0            | 2043966                                     | 287162     | 2718130    | 3861783    |

**Figure 30 - Estimation of economic rent for the different scenarios - Table of figures**

## 6. Assessment of the economic rent from the forest

The economic loss :

| Scenario | Year of harvest | Actualized value in 2014 | Difference with scenario 5 |
|----------|-----------------|--------------------------|----------------------------|
| 3        | 1994            | 824080                   | -3574621                   |
| 4        | 2004            | 3 255028                 | -1143654                   |
| 5        | 2014            | 4 398881                 | 0                          |

Figure 31 - Comparison of three scenarios of rent-seeking - Table of figures

An estimation of the capitalization rate for which it would have been as interesting to cut in 1994 or 2004 as in 2014 was done:

| Scenario | Total value (USD) | Number of years | Capitalization rate | Actualized value (USD) | Capitalization rate | Actualized value (USD) |
|----------|-------------------|-----------------|---------------------|------------------------|---------------------|------------------------|
| 2        | 310579            | 20              | 5%                  | 824080                 | 14.17%              | 4398881                |
| 3        | 1 998305          | 10              | 5%                  | 3255028                | 8.21%               | 4 398881               |
| 4        | 4398881           | 0               | 5%                  | 4 398881               | 5.00%               | 4398881                |

Figure 32 - Internal rate of return - Table of figures

## 7. Conclusions

- The combination of remote sensing tools and sociologic tools enabled to quickly identify management schemes practiced in private forest since the restitution.
- The combination of field inventory and analysis imagery permitted to reconstitute the management practices in private forest since 1991 .
- Harvested volumes and resulting rents were calculated for different scenarios that were compared on a period of 23 years, from 1991 to 2014.
- Whatever the year of the clear cut between 1994 and 2014, this operation would generate more incomes than the legal scheme of management determined by the management plan.