

THE SUBSTANTIATION AND EFFECT OF THE ECOLOGICAL RECONSTRUCTION WORKS IN THE COASTA LUNII PERIMETER

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Abstract. *The purpose of the theme is the knowledge of the installed evolution stands on the degraded lands and their ameliorative effects. The research was conducted on 3 areas of improvement situated in Cluj County and led to the foundation reconstruction. The studies that have been made until now showed that the most effective method of improvement and restore of degraded areas is the afforestation. The recommended species for afforestation degraded areas are: English oak, ash, cherry, flowering ash, seabuckthorn, grey alder. The results showed a favorable effect on soil and local climate through: the improvement of surface leakage regime, reducing the threat of floods, landslides, erosion, improving soil and climatic conditions for culture but also by putting some of the most valuable fields in the economical circuit (business). The ameliorative effect may vary depending on the species and site conditions.*

Keywords: ecological reconstruction, degraded land, erosion

INTRODUCTION

Soil erosion is the process that produced and continuously produces significantly damage to agriculture, forestry and various economic sectors. Man, through its chaotic interventions is the most important factor in the development and increasing soil erosion processes. Annually, large forest areas are deforested in order to get the wood or to create new farmlands and vineyards and new areas for grazing. These activities have a high economic and ecological importance for both present and future (Traci, 1986).

The degree of soil erosion is judged by the amount of washed soil than after the horizon that remains on the surface after the erosion. Thus, in an area of improvement, several degrees of erosion can be found, from 0% erosion which represents a soil without any erosion up to 100% of surface erosion meaning excessive soil erosion.

On the Cluj County territory we have a moderate degree of erosion in a high percentage of 85% and the other 15% are other degrees of erosion. That exemplifies that we have a weak to moderate erosion but not evenly distributed.

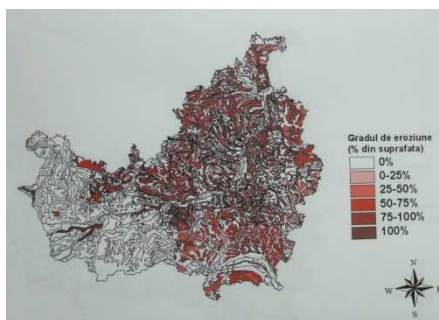


Fig. 1. Map of lands affected by erosion of Cluj Country

As we can see in the near figure, the mountain area of the Cluj County is not affected by erosion or is found in a small percentage. This is because of the forested areas with limited accessibility.

The concept of ecological reconstruction is given by the amount of measures taken to restore a degraded ecosystem due to human intervention. The regeneration of the natural resources allow sustainable exploitation of these lands contributing to the improvement of the environmental quality and also for improving human life quality.

The area under study has a surface of 30.3 ha, and is located in the north-west area of the Transilvania Depression, the upper half of the left side of the Aries meadow. A slope with a pronounced tilt an average slope of 40% (22°) and altitude varies between 328 and 481 meters (ICAS).

The territory is within the Dfbx climate area, with a rainy climate, boreal, cold winters, with rainfalls throughout the year, with temperature below 22° in the warm season. Surface erosion is under the whole area of study in greater or less being produced by the water. In addition to water erosion, overgrazing of the flocks also had an important part.

Landslides are the results of recent imbalanced created of misuse and excessive exploitation of communal pastures and abandoned cultivated areas. So, massive landslides produced big changes on the landscape the superior part generated widening and at the slope material accumulation have formed.

Initially, the land was used as communal grazing and at the base, there were vineyards.

During 1977-1983, about 18 ha, the slope was wooded comprising more stable lands, from the sliding massive. The species used for the afforestation were: pine, ash, red dogwood, walnut and glade. Best success was achieved with ash, pine and red dogwood, later additions were made on about 20% of the land (ICAS, 1985). Although the seabuckthorn is not found on the field it was placed on several areas of separation, which was a success managing to cover all the planted slopes.

MATERIAL AND METHOD

The present study aims to substantiate some work proposals of enhancing by the drainage and afforestation of sliding and eroded lands or other degradations.

The materials and work methods have been establish in accordance with the proposed objectives:

- Oral and written information from specialized literature and forest arrangements towards the territory and the problems of land degradation and afforestation of degraded lands;
- Direct observations and measurements referring to the forest cultures installed on the degraded lands;
- Theoretical analyze, statistic calculation and logical interpretation of the results obtained.

On the area that was under study, a series of measurement and observations have been conducted such as: height and diameter measurements, observations on the number of whorls and health of stands. The height measurements were performed using the hypsometric “Silva ClinoMaster” and the base diameter of trees was measured by forest Clupe “Nestle” 120 cm, at a height of 130 cm from the trunk at ground level.

Table 1

The diameter and height of the trees in the 3experimental perimeters

No. crt	perimeter 1					perimeter 2					
	black pine		manna		undergrowth	english oak		glade		red dogwood	
	Ø (cm)	h (m)	Ø (cm)	h (m)		Ø (cm)	h (m)	Ø (cm)	h (m)	Ø (cm)	h (m)
1	13	8	3	2	seabuckthorn	10	11	6	4	4	3
2	14	8	2	1,6	hawthorn	7	10	6	5	2	2
3	10	7	4	2,4		9	6	8	6	2	1,8
4	14	9	6	4		8	6	6	4	3	2
5	14	11	14	6		7	6	8	6	4	3
6	16	12	6	3,8		4	5	11	7	5	3,6
7	14	10	6	3		6	5	9	5		
8	14	11	4	2,8		6	4	12	10		
9	10	8	6	2,6		8	6	10	7		
10	16	12	4	2		10	7	10	8		
11	10	7	4	1,8		10	6	6	4		
12	10	8				8	10	9	7		
13	13	11				8	8	8	6		
14	11	6				12	6	8	7		
15	16	13				10	6	6	5		
16						8	7	5	3		
17						6	6				
18						6	5				
19						4	5				
20						7	10				
21						10	10				
22						8	6				
23						10	7				
24						13	11				
25						10	9				
26						6	4				
27						12	9				
28						7	6				
29						9	8				
30						9	7				
31						7	4				
32						12	9				
33						12	11				
34						8	6				
35						6	4				
Average						8,4	7	8,1	5,9	3,3	2,6

RESULTS AND DISCUSSION

The research undertaken in Romania showed that the best way to strengthen the land sliding and erosion is the afforestation by creating a protective shield. The forest has efficiency on the fixation and stabilization of the land with a high capacity of drainage and water retention in the canopy and litter. So the technical recommended solution is afforestation.

The study is based on a series of knowledge learned in the past regarding the afforestation solutions of the degraded land in the valley of Transylvania. They studied the site conditions of the degraded lands and the development of forest vegetation. It aimed to establish best work technologies in the afforestation process so that the percentage of mounting and maintaining basic seedling for the main species and mixing to final success, thus avoiding losses of seedling.

To establish the most appropriate solution to afforestation, a differentiation according to stationary conditions has been made so that when mapping were found 8 types of degraded land resorts.

The measures and works proposed for these areas are: drainage works and land preparation, planting, maintenance of plantation and land drainage system.

The plantation is done with the following species: english oaks, ash, cherry, flowering ash, seabuckthorn, grey alder.

Table 2
The diameter and height
of the trees in the 3 experimental
perimeters

Nr. crt.	perimeter 3			
	ash		cherry	
	Ø (cm)	h (m)	Ø (cm)	h (m)
1	14	13	14	11
2	10	8	8	5
3	15	13	20	16
4	9	7	7	4
5	9	8	17	14
6	8	12	16	14
7	14	12	12	9
8	11	9	10	8
9	17	14		
10	13	11		
11	13	12		
12	12	9		
13	12	10		
14	11	9		
15	12	11		
16	11	8		
17	12	10		
18	12	10		
19	11	8		
20	8	6		
21	8	7		
22	4	3		
23	8	6		
24	7	4		
25	8	6		
26	11	8		
27	9	7		
28	17	14		
Average	10,9	9,1	13	11,3

CONCLUSIONS

Quick intervention on consolidation works is necessary due to the land sliding process affecting the area under study and other productive agricultural lands and neighboring vineyards. However, landslides have advanced strongly and endangering the watershed.

The afforestation of degraded lands will diminish the impact of climate change, improving the surface leakage system, diminishing also the risk of floods,

erosions, landslides. Some important lands are introduced in the economic circuit improving the pedo-climatic conditions for culture.

Favorable influence of afforestation works are visible trough: prevent of further loss of forest and agricultural land, preventing impairment of crops, the production of wood in the forest crops proposed for fruits production, improve the landscaping area.

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