

Methodology and criteria used to analyse and select reforestation projects

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1. Introduction

In a context of responsible forest management and the national objective to increase the forest area it is very important that our efforts also be directed towards communities and owners that lack the financial capacity to regenerate their forest areas.

The partnership between the Forest Administrators's Association, the Stefan cel Mare University of Suceava (USV) and Holzindustrie Schweighofer aims to develop and implement a wide reforestation project whereby a million seedlings will be planted in Romania, on private forest land areas with incomplete or no regeneration.

Regarding the general goal of the project, the Stefan cel Mare University of Suceava, using its forest research experience, will develop and apply a methodology to identify and select the reforestation areas.

The general objectives of the USV team's research activities focus on:

- Development of a methodology and set of criteria used to select the reforestation areas and establish the regeneration emergencies;
- Collect and analyse data regarding the reforestation areas registered in the project and apply the selection methodology;
- Field check and data validation for selected areas;
- Establish regeneration emergencies and schedule of works for selected areas.

2. Methodology, criteria and indicators

2.1 General matters

The criteria and indicators around which the methodology was built for the selection of reforestation areas and setting the regeneration emergencies follow the compatibility with the general European and international framework on afforestation/reforestation (*Pan-European Guidelines for Afforestation and Reforestation*), the recommendations and provisions of forest certification systems (*Forest Stewardship Council FSC, Programme for the Endorsement of Forest Certification PEFC*) and national technical norms – *Technical Norms regarding the compositions, schemes and technologies for forest regeneration and afforestation of degraded lands* (Technical Norm 1, 2000).

This methodology is also built around the fact that reforestation works are done based on projects that need to follow the *Technical Norms regarding the compositions, schemes and technologies for forest regeneration and afforestation of degraded lands* (Technical Norm 1, 2000), approved by Minister's Order no. 1648/ 31.10.2000. These reforestation projects need to be elaborated by specialists, either individuals or legal persons, certified by the national authority on forestry for design and/or execution of forest land improvement works.

The indicators being used for the selection of reforestation areas and setting regeneration emergencies were grouped around two criteria, **forestry-technical** and **socio-economic**.

The methodology includes a complete description of the indicators, means of evaluation and the associated grades.

In **identifying and defining the indicators**, the goal was to have indicators that are clear (without ambiguity in definition or interpretation), relevant (specific and directly relevant in establishing regeneration emergencies), objective, easy to assess and adaptable to various situations that may occur in the field validation phase.

When it comes to **applying the indicators**, the means to interpret or grade is stipulated for each of them, setting categories or items that define particular situations as well. A grade is specified for each category or item and a maximum possible grade for an area can be calculated.

Following data collection, field checks and validation, an evaluation sheet is prepared for each proposed area, which looks at all indicators. Each indicator is given a grade, in line with data specified in the methodology.

Calculating the final grade: adding up the grades for each indicator gives the total for an area. Scheduling the interventions or setting the regeneration emergencies is done by ordering the areas top-down and top positions (highest grades) represent the intervention emergencies, within the financing limit for that respective session.

In case the applications don't get a minimum score of 60 points, these will not be included in the programme list and they will not be validated for financing. The methodology has gone through a validation phase with field data and situations, and the feedback led to adjustments of indicators or the way they are assessed. Situations that make the assessment difficult were identified and analysed, which triggered modifications of the initial methodology.

2.2 The set of criteria and indicators

This section defines the proposed indicators, grouped around the two criteria mentioned above. Each indicator is described, a justification is provided along with the means to evaluate or grade and the associated values. Eligibility conditions for the applications were added. Also, applications that fail to score a minimum of 60 points are no longer included in the final hierarchy of applications.

General eligibility conditions

- The proposed reforestation area needs to be official forest land, with an area of minimum 0.5 hectares;
- The proposed reforestation schemes need to contain local species and exclude exotic/invasive species (black locust, northern red oak, ailanthus, black cherry, Russian olive, box elder, Indian bean tree, white mulberry, black mulberry, green ash, Douglas fir, eastern white pine etc.);
- Eligible owners are individuals, owners' associations, common ownership bodies (composesorat, obste), village halls or councils. Legal persons involved in commercial activities are excluded;

- Wood pastures that were included in forest management plans during the last 10 years are not eligible.

A. The forestry-technical criterion

- Indicator: **Land category**

- **Description:** sorting by land category, according to applicable technical norms (Technical Norms 1, 2000) (See Annex 2).
- **Justification:** land categories indirectly reflect categories of works and regeneration priorities implicitly. Considering the project's objectives, reforestation priorities are forest stands affected by calamities, affected entirely or partially by biotic or abiotic factors (A3 land categories) and areas where natural regeneration is incomplete (C1 land category).
- **Assessment:** analysis of forest stand information in the forest management plan and field observations in order to establish belonging to categories A3 and C1 (NT1, 2000)¹.
- **Classification:** 2 categories, corresponding to the subcategories A3 and C1.
- **Grade (maximum 40 points - minimum 0):** A3 - 40, C1 – 20, the other land categories – 0.
- **Interpretation/ assessment difficulties:** difficulties with identifying the factors that caused disturbances in the case of calamity areas.

- Indicator: **Time of removal of the forest vegetation**

- **Description:** the time of removal of mature forest vegetation refers to the period, in years, that passed since the event that led to forest cover loss, no matter its type (calamity, regeneration cut).
- **Justification:** the time of vegetation removal influences the receptivity of the land to the regeneration action and implicitly the success and efficiency of the works.

¹ The A3 land category includes calamity areas, affected entirely or partially by biotic and/or abiotic factors and the C1 category includes land areas where natural regeneration is incomplete. The entire description of land categories according to the technical norms (NT1, 2000) is found in Annex 2.

Priority goes to areas where the vegetation was removed recently, aiming to ensure the continuity of forest cover, so as to limit possible erosion processes and maintain specific features of the forest ecosystem.

- **Assessment:** the time of vegetation removal is assessed by analysing the history of works that were done and registered in the forest management plan, and if these lack by analysing landscape dynamics on imagery material (satellite imagery, orthophotomaps) available for the areas or by analysing information collected in the field.
 - **Classification:** 3 categories corresponding to three periods (up to 2 years, 3-5 years, over 5 years).
 - **Grade (maximum 20 points - minimum 0):** ≤ 2 years – 20, 3-5 years – 10, > 5 years – 0.
 - **Interpretation/ assessment difficulties:** lack of records on works done/ calamities or limited availability of imagery for the selected area.
- **Indicator: Land vulnerability**
 - **Description:** land vulnerability refers to the factors that facilitate the launch or upsurge of erosion/ degradation processes (high slope and erosion processes).
 - **Justification:** priority goes to areas with such vulnerability factors, in order to limit or stop degradation processes.
 - **Assessment:** field observations regarding the presence of these factors.
 - **Factors that influence the score:** maximum slope $25-34^\circ$ and over 35° , existence of erosion/ landslide phenomena on minimum 10% of the area (intense surface erosion, down to the bedrock, or landslides).
 - **Grade (maximum 20 points - minimum 0):** 3 items: slope over 35° - 15; slope $25-34^\circ$ - 10, existence of erosion phenomena – 5; (cumulative grading)
 - **Interpretation/ assessment difficulties:** assessment of the span of erosion phenomena.
 - **Indicator: Adjacency to a forest stand**

- **Description:** adjacency to a forest stand refers to proximity of the selected area to a compact forest area.
 - **Justification:** priority goes to areas in the proximity of other forest stands because the consolidation of forest stands represents an objective leading to an increase in connectivity at the level of forest landscape, with beneficial influence on the dispersion of populations in the selected area.
 - **Assessment:** it is done by means of measurements on imagery material (satellite imagery, orthophotomaps) of the minimum distance (km) between the selected area and the closest compact forest stand larger than 0.5 hectares (including areas recently regenerated that reached the state of complete forest cover).
 - **Classification:** 3 categories of distance (< 0.5 km, 0.5-1 km, > 1 km).
 - **Grade (maximum 10 points - minimum 0):** < 0.5 km – 10, 0.5-1 km – 5, > 1 km – 0.
 - **Interpretation/ assessment difficulties:** limited availability of recent imagery material for the selected area.
- **Indicator: Complexity of the forest ecosystem**
 - **Description:** the complexity of the forest ecosystem is assessed by means of specific diversity (on the level of tree species) of the regeneration solution recommended and justified by applicable technical norms for the selected area.
 - **Justification:** priority goes to areas with high complexity, encouraging regeneration solutions that include a higher number of tree species, to the detriment of monocultures, in order to achieve stable forest ecosystems.
 - **Assessment:** the input data is the forest type or stand type. Based on the forest type or, if it is missing, stand type, the ecological group is determined along with the regeneration composition indicated by the technical norms (Technical Norms 1, 2000). The number of species indicated in the regeneration composition for the selected area is then determined.
 - **Classification:** 4 categories (> 4 species, 3-4 species, minimum 2 species, monocultures).
 - **Grade (maximum 20 points - minimum 0):** > 4 species - 20, 3-4 species – 10 , minimum 2 species – 5, monocultures – 0 p.

- **Interpretation/ assessment difficulties:** lack of data or studies regarding forest type or stand type for the selected area.

B. The socio-economic criterion

- Indicator: **The financial capacity to implement regeneration works**
 - **Description:** the financial capacity to implement the regeneration works is analysed indirectly by means of two items. The first item takes into account the applicant's property size included in the forest management unit's administration contract. The second item reflects the potential beneficiary's involvement in the regeneration action, by means of co-financing².
 - **Justification:** the size of the forest property indirectly reflects the beneficiary's financial capacity. The goal of the project is to offer technical and financial assistance first of all to small forest owners that have areas with regeneration difficulties. Higher grades will be granted to the applications of owners of small forest areas that cannot compensate high regeneration costs with wood harvested from other forest properties of theirs. In the case of the second item, ensuring co-financing reflects the responsibility such an action involves. In general, things that come free of charge can be perceived as being worthless, which is why, in this case, co-financing represents a means to add value to the action.
 - **Assessment:** Data is collected from the forest management unit on the owners's property size, based on the administration/services contract between the owner and the forest management unit. Information regarding co-financing will be taken from a co-financing agreement³ signed by the owner.
 - **Grade (cumulative for 2 items, maximum 30 points, minimum 0):**

² Co-financing is not an eligibility condition, it is a form of increasing responsibility, whereby the owner states his involvement in the regeneration action and it increases the grade of the application.

³ The co-financing commitment needs to be signed by the owner by the date the financing application is submitted and it must mention the percentage covered of the final costs of the regeneration works.

For the size of the property, < 5 ha – 20 points, 5-10 ha – 10 points, > 10 ha – 0 points.

Co-financing: >20% - 10 points, 10-19% - 5 points, <10% - 0 points.

- **Interpretation/ assessment difficulties:** possibly situations difficult to assess in the case of disputed lands.

- **Indicator: Social impact**

- **Description:** the social impact is reflected by the registration of the selected areas in relevant functional subgroups and categories, in line with technical norms (Technical Norm 5, 2000).
- **Justification:** forests fulfill diverse protection functions that neighbouring communities benefit from. Priority goes to areas registered in one or several functional categories that are relevant in terms of social impact.
- **Assessment:** the forest management plan is checked for registration in functional subgroups and categories. A grade will be given to instances when areas are registered in: subgroup 1.1 (all categories in the subgroups of forests with water protection functions), subgroup 1.3 (categories 1.3.e, 1.3.h, 1.3.i and 1.3.j in the subgroup of forests with climate and industrial protection functions) and subgroup 1.4 (categories 1.4.a, 1.4.b, 1.4.c, 1.4.d, 1.4.e, 1.4.f and 1.4.i in the subgroups of forests with recreation functions).
- **Grade (maximum 15 points - minimum 0):** 5 points are granted for each functional category in the list mentioned above, but not more than 15 points for the whole indicator.
- **Interpretation/ assessment difficulties:** the evaluated area lacks a stand description.

- **Indicator: Degree of forest coverage for the neighbouring area**

- **Description:** the degree of forest coverage reflects the proportion of forestry land use in the area neighbouring the study area.
- **Justification:** the access of local communities to forest resources is very important, and an area's forest coverage degree is an indicator of high ecological and social

importance. In this context, priority will be given to cases where the forest coverage of the area is low.

- **Assessment:** the degree of forest coverage will be measured on imagery material (satellite imagery, orthophotomaps). The assessment will be made on an observation area of 10x10 km around the centre of the study area.
- **Classification:** 3 categories of forest coverage (< 10%, 10-30% , > 30%).
- **Grade (maximum 20 points - minimum 0):** < 10% - 20, 10-30% - 10, > 30% - 0.
- **Interpretation/ assessment difficulties:** limited availability of recent imagery material for the study area.

Bibliography

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Annex 1. Regeneration project file

1. Date of field visit

2. Location data:

Forest management unit		Production unit	
Management unit		GPS coordinates	

3. Physical-geographical characteristics

Altitude (m)	Exposure	Slope (°)

4. Reforestation area (ha)

5. Land category: A3 C1 other categories

6. Natural type of forest/ stand

7. Ecological group

8. Time of forest vegetation removal

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History of works / other observations:

Annex 2. Land categories

According to applicable technical norms, afforestation or reforestation lands fall in one of the following categories (***, 2000. *Technical Norms regarding the compositions, schemes and technologies for forest regeneration and afforestation of degraded lands*):

- A) land with no ligneous vegetation, i.e.:
 - glades and unregenerated gaps within the forest;
 - areas with land use changed to forestry, assigned for afforestation;
 - areas with no ligneous vegetation following calamities (fires, windfalls, mass tree death etc.);
 - areas (plots) resulting from clearcuts.
- B) land with improper forest stands from a forestry-biological and/or economic point of view, due to be reforested:
 - Lands with provisional, derived forest stands (birch, aspen, maple, hornbeam, linden etc.)
 - Lands with low yield forest stands that cannot regenerate naturally;
 - Lands with forest stands that require interventions in order to improve their composition and/or forest cover ratio.
- C) land with incomplete natural regeneration:
 - Forest stands where regeneration cuts took place and there are areas with no regeneration or regeneration took place with species that aren't recommended by the regeneration composition, with impracticable or damaged seedlings etc.;
 - Forest stands where grove cuts took place and there are areas with no regeneration, where the introduction of valuable species is recommended.
- D) other land areas, i.e.:
 - Lands that require additional seedlings;
 - Lands that were in temporary use, other than forestry, which are to be reforested (land without topsoil, waste deposits etc.).