

4. Evaluation and appropriate management of the degree of achievement of the improvement target

4.1 Why is an evaluation necessary?

(26) In order to prevent unwanted results such as restoration of the wasteland, it is necessary to clarify the process of the growth in order to evaluate the degree of achievement of the improvement target.

- Several decades are necessary to complete transition to the target forest, and in order to prevent unwanted results such as the restoration of wasteland, it is important to clarify the process of growth. This means that various monitoring surveys must be performed every 3 to 5 years to evaluate the degree of achievement of the improvement target at the time of each survey. The results also provide basic information to determine the need for management and management methods.

4.2 What is the object of the evaluation?

(27) The evaluation is done by performing monitoring to determine how firmly the vegetation has been established and the state of transition of the vegetation, formation of soil, control of the runoff of sediment and so on to find out how much progress is being made to reach the target.

- The principal items evaluated are:
 - State of establishment (growth) of species
 - Transition (invasion) of vegetation
 - State of development of the soil → soil hardness survey, ph test
 - State of control of sediment runoff → sediment runoff survey

} Vegetation survey

And as necessary, surveys of the change over time of species of biological communities and number of each species are performed to evaluate the degree of the restoration of the natural environment by the hillside work based on indices of similarity.

- Confirming the vegetation foundation stability (degree of rot survey)
 - Clarification of the degree of rot using a Yamanaka type soil hardness meter
 - Observing and recording the degree of rot by visual examination
- Confirming the establishment of the vegetation
 - Hillside work introduction effects (observing and recording the establishment of the vegetation)
 - Relationship with the characteristics of collapsed ground (measuring the soil layer thickness and the slope gradient)

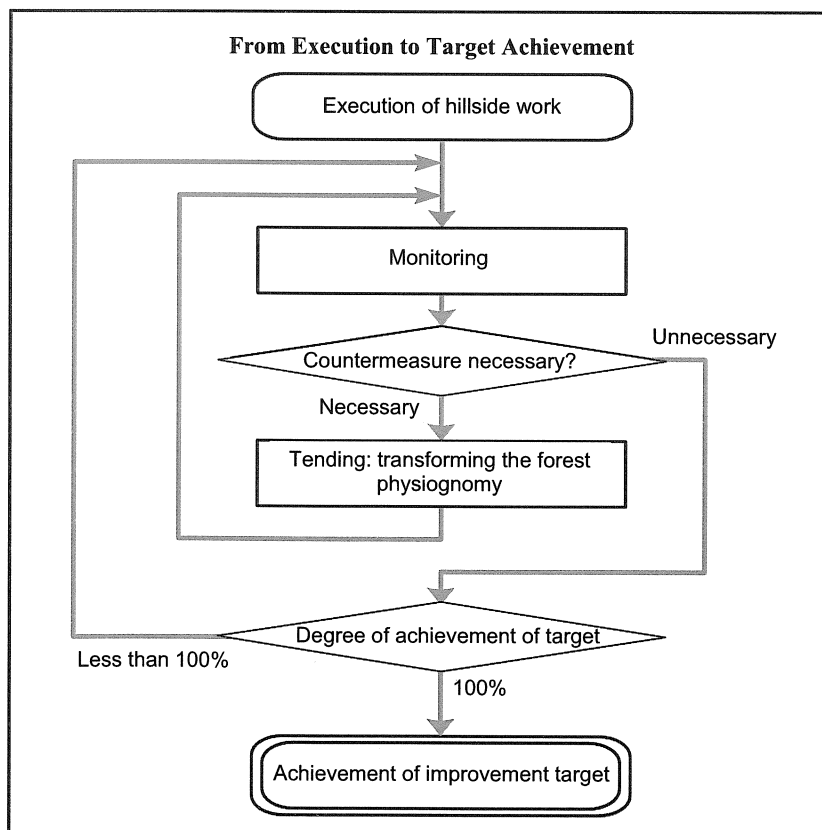
Tsuchiyabara hillside work: Various surveys shown on the left are performed after execution to verify the effectiveness of introduction and to study the effective application of the method according to local characteristics.

4.3 What is appropriate management?

(28) When the transition to the target forest has been obstructed, its cause must be discovered to perform suitable management to resolve the problem.

- When the results of an evaluation of the degree of achievement of the improvement target reveals any of the following signs of the obstruction of the transition to the target forest, it is necessary to perform appropriate management to encourage the transition to the target forest.
 - The vegetation is not established.
 - The vegetation has deteriorated (return of wasteland conditions)
 - Clear delay in the vegetation transition considering the elapsed time is revealed.
 - Sediment runoff control effects have not improved.
- The following appropriate management is performed according to the cause and urgency.
 - The situation is not serious and its cause is not specified → continued observation of the process
 - Light conditions are poor so that grasses and next generation vegetation do not grow (or do not invade) → thinning trees, forest physiognomy conversion etc.*
 - Confinement by grasses → mowing grass, mulching
 - Poor growth caused by soil conditions (soil particle diameter, dryness) → soil improvement by wood chips, mulching
 - Pest (insects/vermin etc.) → nets, installation of vegetation protection pipes

Forest physiognomy transformation* --- In order to qualitatively improve the existing forest, new vegetation is introduced and aggressively managed on land where existing trees have been removed by thinning or clear cutting to encourage the growth of a more stable forests.



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