

2. Improvement targets

2.1 What degree of improvement is considered as a *sabo* project

(8) First, considering early revegetation as a transitional point in the improvement.

(9) Simultaneously improving with the formation of the target forest as the first target.

- It is assumed that control of the constant sediment runoff can be almost achieved when, following the execution of the hillside foundation work, the pioneer vegetation has been established either by natural invasion or by hillside revegetation work, or by covering the slope surface. In the past, improvement was done from this perspective by considering early revegetation to be the first step.
- On the other hand, because trees that are primarily pioneer vegetation lack diversity and are unstable, according to circumstances, it is possible for this vegetation to deteriorate, allowing the restoration of wasteland conditions. There is also a demand for efforts to conduct projects to achieve genuine natural restoration as a consequence of the recent growing concern with the natural environment. Consequently, as a *sabo* project, its object must be the creation of a sound forest consisting of stabilized vegetation, and the improvement must be undertaken with the creation of the target forest that is the bridge to formation of the climax forest as the goal.

Target forest and secondary forest

The working group previously used the term “secondary forest” as the forest that is the target of hillside work, in the sense that the goal is a vegetation colony of the constituent species that are identical to those in a secondary forest.

Because the original meaning of “secondary forest” is a forest that naturally recovered after the virgin vegetation had been destroyed by a forest fire, intensive rainfall, or insect pests etc., in this case, it means a forest growing on preexisting forest soil. Because the term “secondary forest” may cause misunderstandings, “secondary forest” has been replaced by “target forest” as the word to define the target of hillside works.

2.2 To the formation of the target forest

(10) The constituent species of the target forest differ according to whether it is a warm or cool area, even under an identical temperate climate.

- Japan is classified as a temperate climate zone, but depending on whether it is a warm area or a cool area, the colonies established later vary. The transition of the large trees is generally the creation of the climax forest by the process—pioneer vegetation → deciduous broad leaf trees → coniferous

broad leaf trees in a warm zone. But in a cool zone this process is the transition: pioneer vegetation → deciduous broad leaf trees followed by the replacement of these species to create the climax forest. As pioneer vegetation, the coniferous broad leaf medium and low trees (*Eurya japonica* Thunberg, longstock holly (*Ilex pedunculosa*)) the large trees (camphor tree (*Cinnamomum camphora*), *arakashi* (*Quercus glauca* Thunb), *shirakashi* (*Quercus myrsinaefolia*)) are established but these represent a transitional phase in the process.

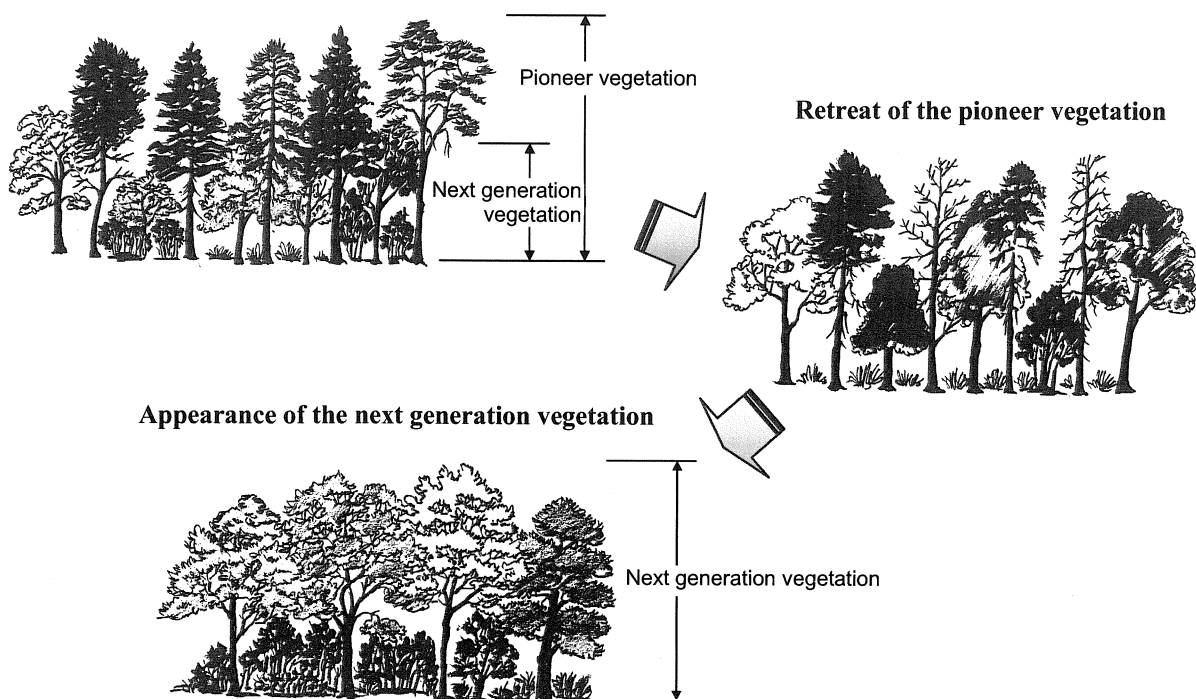
- The large trees of the target forest are, in warm areas, mainly *konara* (*Quercus serrata* Thunb. ex. Murray) but including sawtooth oak (*Quercus acutissima* Carruthers) and *abemaki* (*Quercus variabilis* blume), and in warm areas, the target forest consists generally of *mizunara* (*Quercus crispula* Blume), hornbeam (*Carpinus laxiflora*), or *itayakaede* (*Acer pictum*).

(11) Supplementing the formation of soil with pioneer vegetation to support the invasion by the next generation species.

- After execution of the hillside work, the soil conditions are not completely provided, so the formation of soil is supplemented by the pioneer species to support the invasion of the next generation species. In order that this be done effectively, it is necessary to select species suited to local conditions.

(12) Forming a diverse forest physiognomy

- In order to prevent a reversion to wasteland, it is necessary to form a diverse forest physiognomy so that when the pioneer vegetation has retreated, the next generation vegetation can appear.



(13) Forming a stand with a developed stratified structure.

- In order for the sediment runoff control function, water retention function and other functions of a forest to be effective, it is necessary to form a stand with a developed stratified structure.

