

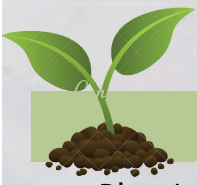
ALLOW NATURE TO RESTORE DEGRADED ECOSYSTEMS: A PLEA FOR ASSISTED NATURAL REGENERATION

Forests play a vital role in many ecological processes. In addition to harboring diverse flora and fauna, forests provide numerous ecosystem services, and the benefits of the forests to man are well known. However, due to various factors, the global forest cover has been declining significantly in recent times. According to Global Forest Watch [GFW], Sri Lanka lost 10,500 ha of humid primary forests from 2002 to 2021 period. Therefore, the forest cover in our country must be increased.

We have many ways to address the problem of deforestation. The most common method used to increase forest cover is to plant trees in selected areas. However, this method has some drawbacks. First, the sites selected for planting trees may not be suitable for the purpose. Secondly, the trees selected for planting are not suitable for the ecological conditions of the selected site. The most commonly used plants for these planting projects are those that are commonly available at the time in the nursery. It has been observed that trees suitable for lowland areas, such as Mee [*Madhuca langifolia*] and Kumbuk [*Terminalia arjuna*], have been planted in mountainous areas. It is advisable to select native, early, or mid-successional tree species for afforestation.

It is observed that when selecting native trees for afforestation, the tendency is to use late-successional or climax tree species which are not adapted to the sites. When they fail, the whole exercise is abandoned claiming that our native species are not suitable for afforestation. Consequently, in many instances, non-native plants are used for this purpose.

The Department of Forest Conservation has been cultivating exotic plants for the plantation industry since 1870. These plantations at present cover nearly 93,000 ha and consist mainly of teak [*Tectona grandis*], *Eucalyptus* species, *Pinus* species, and mahogany [*Swietenia macrophylla*]. Such monocultures do not have the biodiversity or functional diversity found in normal, natural forests. However, it should not be forgotten that such plantations also provide numerous environmental services. It was also observed that some tree planting programs are conducted in grasslands. Some people think of grasslands as degraded ecosystems; therefore, they plant forest trees to 'rehabilitate' those sites. Sadly, they are not aware that these grasslands are also unique ecosystems.



Planting trees in the gaps in degraded forests to restore them is another common practice. These enrichment plantings are often extremely useful, but even their success depends on choosing the right plants. Nature knows exactly what trees are suitable for the site. The plants we choose may not be suitable for the location. Restoring the degraded lands to their natural conditions with primary forest species is a challenge and a difficult task. One other way is to allow the forest to restore naturally. This system also has various obstacles. The soil seed bank is generally rich in native seeds but light-demanding and fast-growing early pioneer species and alien invasive plants suppress the regeneration of native, late-successional tree species. Therefore, the restoration of degraded forests using established common methods, including natural regeneration, is very challenging.

Promoting the growth of natural tree species, in sites regenerated naturally, can be done by selectively removing the aggressive weedy species that compete with the natural tree seedlings. The seedlings that appear in the naturally regenerating sites are those that come mostly from the soil seed bank.

In other words, those seedlings are selected by nature and not by man. If the survival of those seedlings is assured by removing the competitive species it will be possible to get a collection of trees ideally suited for the site

Assisting the natural regeneration of forest trees in that way is called Assisted Natural Regeneration [ANR]. ANR is a successful method to re-establish forest cover in deforested lands. This method allows natural seedlings to establish and mature. It overcomes obstacles that are generated by natural regeneration and artificial regeneration.

The NIFS- Popham Arboretum in Dambulla is one such woodland developed by ANR. This Arboretum is situated about two and a half kilometers away from Dambulla by the Kandalama Road. It was owned by an Englishman, Mr. F. H. [Sam] Popham, who gifted it to NIFS [then IFS] in 1989 to carry out research and educational activities. When Popham bought this land in 1963, it was a seven and half acre-scrub jungle. Popham allowed the indigenous tree saplings in the site to emerge and establish themselves by removing the 'weedy' shrubs around them. Consequently, the original scrub jungle was turned into a tall woodland with a closed canopy. After taking over the land in 1989, IFS bought and added another 27 acres of adjoining scrubland and expanded the arboretum. Popham's "Assisted Natural Regeneration [ANR]" method was practiced.



About 36 acres of degraded land now have been converted into dense woodland over a period of about 20 years. Interestingly this land is now occupied by over 350 plant species belonging to 89 families, and this forest is now a habitat for many species of mammals, birds [with migrants], and butterfly species. This Arboretum is now a refuge for unique animals such as the slender Loris and pangolin. It is interesting to note that when ANR is practiced, the wildlife in the restored site is improved gradually.

The presence of wildlife implies that the conditions are suitable for the sustenance of those indigenous species on the site. Forest is a complex system with many biotic components having numerous functional diversities. A site restored by ANR is very similar to natural vegetation with high biodiversity providing many ecosystem services. NIFS Popham Arboretum is a very good example of such a site.



After a long period of restoration

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