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RESEARCH ARTICLE

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COMPARISON OF MIYAWAKI AFFORESTATION METHOD WITH ALTERNATE AFFORESTATION MODELS OF PEEPALBABA AND AUROVILLE

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ABSTRACT

As the Miyawaki afforestation method is gaining popularity all over the world, it is important to understand implications of using this method. The most attractive feature of this method is the speed of growth of the forest. Within three years, a fully-grown, self-sustaining forest is ready. It also has various layers of a natural forest - grass, shrubs, small trees and canopy trees – that enables it to mimic the natural forest. However, Miyawaki forest is an expensive proposition. It needs at least Rs. 30-40 lakhs (\$36000 – 48000) per hectare to grow the forest. This paper discusses other popular models in India for growing a forest. One model is of a widely revered tree grower, Peepalbaba, who advocates planting species like peepal, banyan and neem. Another model, cited often as a successful model for afforesting a barren land, is of Auroville. This paper compares these models to understand how each one works.

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INTRODUCTION

The world needs more vegetation, more forests. Nations have been trying to develop green cover over their soils. Japan has around two thirds of its land covered by forests but these are on the lands that are not habitable. The cities do not have much greenery in Japan. Germany has one third of its land under forest and about 70% of that land is in the mountainous region. More than half of Brazil is covered by forests but most of these are the primary forests of Amazon. More tree cover is needed in human habited areas too (data from Worldbank). Miyawaki afforestation method has been gaining popularity all across the world. Cardenas *et al.* (2022) study point out that 175 micro forests have been planted in the cities and towns of UK, using Miyawaki method. Similarly Japan and South America also have been using the method extensively, as reported by Poddar (2012). Kurian (2022) examines the issue of urban heat islands because of low vegetation in urban areas and concludes that Miyawaki forest method is a good method to address this problem because of its ability to grow in small spaces, protection from disasters, bio-diversity maintenance and carbon sequestration. In our paper, "Analysis of the Miyawaki Afforestation Technique" (2023), we have described how the technique can be used, the cost of planting a Miyawaki forest and some criticisms. Considering that the method is very expensive and can be used only if support is lent by a corporate entity, this paper looks at other popular models of afforestation that have met with a lot of success over years. Peepalbaba has been planting trees across India and has planted more than 2,00,00,000 trees by now.

Auroville took up a barren land close to Pondicherry around 1980s and has transformed it as a green patch with lush green forests all around. The Auroville team since then has been involved in helping other places in growing forests. The information gathered for this paper is based on the personal interviews conducted with Dr. R. K. Nair, who has grown 102 Miyawaki forests across India; Peepalbaba or Swami Prem Parivartan, and Mr. Arun Ambathy from Auroville. Points of contrasts and similarities between Miyawaki and other models

Site selection: Peepalbaba is very clear that we should intervene with tree growing only in those areas that have been affected by human activities and have degraded. We should not intervene where there are already forests standing. Peepalbaba also believes that we should not grow trees where there are supposed to be no trees. If it is a rocky land or a sandy desert where nothing ever grew, we should not try to grow trees there. Concentrate on the areas that are degraded. They need help in reviving. The Auroville model largely agrees with this. The Miyawaki method is used by a range of people across the world and hence no such strong philosophy exists for them. They grow forests wherever they are asked to. They put the layer of top soil by importing it from elsewhere, so theoretically, they can grow the forest in any type of urban land. All three models though believe that the area to be revived with forests should be free from any human interaction. Grazing also should not be allowed. Trees should be given complete freedom to grow without any attempt to uproot/harm them. Hence all models strongly advocate fencing the land before any activities are started.

Preparation of the site: There is a vast difference between the approach here between Miyawaki and the other two models. Under the Miyawaki method, the top soil cover is dug up for 3-4 feet, rejuvenated with cocopeat, cereal husk, vermicompost, etc. While this method is effective, it is expensive too. You need large quantities of cocopeat, vermicompost, etc. You also need to get good soil from elsewhere to put it on top of the existing soil, if the soil is not hospitable to plant growth. Dr R K Nair, a proponent of the Miyawaki method, understands the environmental concerns. For one project, he got the fertile soil to put on the top of a dead soil by deepening ponds close to the area. The soil coming out of the ponds was rich and provided a good base for afforestation. He grew a forest on chemically polluted land by digging a canal for outflow of the chemical effluents and using the soil of the canal as top soil for the contaminated ground. He thus tries to use the locally available good soil to use as the top layer. But digging the ponds, getting large quantities of cocopeat and vermicompost, and other materials makes the project very expensive. We are not sure whether the other growers of Miyawaki forest take care to not import fertile soil from elsewhere (thus impoverishing the exporting region of its soil). Thus there is a possibility that environmental damage was done to some other area. Both the Auroville and Peepalbaba models rely on pioneer species (local species that grow in the barren land) to green a barren land. These species could be grass, shrubs or small trees. Peepalbaba says that even *VilayatiKeekar* (*prosopisjuliflora*) can be useful in this. Once this vegetation grows and takes roots, it breaks the land and also catches water with their roots. Now the soil is ready to get more trees. Other species are introduced then. If needed, the pioneer species can be removed. Peepalbaba says that start planting ficus trees like peepal and banyan where the keekar has taken roots. Once these trees grow, the sunrays will be blocked by them and the keekar will slowly become much less dominant. Fertilizers are applied but these are usually mulch from the surrounding regions, kitchen waste, etc. The quantity used is not as much as the Miyawaki method. Because of these differences in the methodology and philosophy, a major difference arises: While the Miyawaki forest takes just three years to grow 20-30 feet tall, these models take time before the entire forest comes up. The former is resource intensive, the latter depends more on the natural way of growth. Some people say that because of this, the Miyawaki method is not as environment friendly as the other method.

Providing for irrigation: Saplings used for growing the trees are usually too tender and weak to survive without water. El Nino also has started creating more and more droughts. All methods, hence, emphasize on creating a reliable water source. A well, a tubewell, a pond, whatever. This would come handy in initial years when the trees are growing. Once the vegetation reaches its adult form, the dependence on these water sources will be minimal. After three years, these water sources can become precious water sources for the surrounding areas. The water levels in them also will be higher because the forest soil would hold more water, thus enabling more recharge of the ground water.

Species selection: All of these afforestation methods, Miyawaki, Auroville or Peepalbaba's, believe in planting multiple species. None of them believe in monoculture. All of them say that local species should be planted. While the alternate models rely mainly on the local species, Miyawaki method uses some foreign species too, to introduce some more variety. All methods help in preserving the local biodiversity. All models require some kind of support for buying the healthy saplings. All models recommend using grass, shrubs, small and large trees for afforestation. None advocate only large trees. In this respect, they are very different from the conventional model used by the Forest Department.

At least 80-90 species are planted in the Miyawaki method. Interestingly, neither of the other two models insist on planting a certain number of species. It is not mandatory for them to have 80-90 species. They grow as many as local species they could find; and will keep adding to that with the help of the local community.

Enhancing the biodiversity: All models use many varieties of trees for growing a forest. Thus each forest grown by any of these methods has been able to attract a variety of birds and animals. Birds come first - maybe they get an overview from above and decide to descend on the forest. Animals come slowly but they do come. Since these small forests are dense, usually they do not attract large animals. The vegetation growth is too close and thick to enable the movement of large animals.

FUNDING

As pointed out earlier, the Miyawaki method is much more resource intensive and hence it usually requires corporate funding. Most proponents of Miyawaki, including Miyawaki himself, used the corporate funding for growing trees. Auroville used government funding, in addition to the donations by various funding agencies. Peepalbaba uses whatever funding comes to him. The main source is the corporates, but funding in various forms (in terms of labor, equipment, and such) are encouraged by him. It should be noted that the money needed by Auroville and Peepalbaba is lesser compared to the Miyawaki method.

CONCLUSION

Given the points discussed in the article, it is natural to ask, which method should be advocated for growing forests? It depends. If you get a lease of the land only for 3-4 years, you need a method that grows trees quickly. Miyawaki should be the choice, if you also have the access to corporate sector funds. If you are working in an urban area and are dealing with soil that can be easily molded for vegetation growth by adding fertilizers, Miyawaki would be a good method to employ because the trees will grow quickly and it won't be very expensive because the top soil cover does not need to be imported. If there is no hurry, then it is best to let the nature work through the less intensive Peepalbaba or Auroville model.

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