Climate Smart Village Project

Case Study on Miyawaki Plantation

Background

Ananthapur is the southernmost district of the Rayalaseema region of Andhra Pradesh. While agriculture remains the most important economic activity of the district, it is characterised by high levels of instability, uncertainty and the area is drought prone.

Due to the changes in climatic conditions in this area, it is observed that there is missing of seasons, delay of rains, unpredictable rainfall, rising temperatures, depletion of natural resources, and severe drop of temperatures during winters. This is adversely affecting the food chains, plant, and animal habitats where is agriculture facing fluctuating yields and low incomes to farmers.

The degradation of forests that were carried out in the past led to deterioration of natural resources. All these circumstances are due to the human interactions with the nature and the environmental restoration is the only solution. To address the climate variations, restoring common lands, forest ecosystems and recreating them is the only solution. As recreation of forest is a time taking process, innovative techniques can be adopted to create green cover in shorter span of time.

Climate Smart Village Project

To achieve restoration of the environment, reforestation is the only possible solution for the above mentioned issue. APMAS with its funding partner AEIN, Luxemburg in collaboration with two FPOs of two mandals Nallamada and Gudibanda has implemented ***"Climate Smart Village"*** (CSV) project for 3 years from 2019 to 2022.

Under the project "***CSV",*** an innovative model of rejuvenate the forests, it is planned and has established this innovative forest in 2 schools of Gudibanda mandal. That is called **"Akira Miyawaki Plantation".** The concept was designed and developed by Mr. Akira Miyawaki, a botanical scientist from Japan to regenerate greenery in the area and reduce emissions. The forest was established by planting of fruit and forest saplings in a very small area to develop for a dense and thick forest. This forest have multi facet advantages such as temperature balance is maintained, improves air quality, sequestration of CO_2, enhances carbon sink and improves biodiversity.

This systematic approach of forest management is necessary to sustain the ecological balance and stability of the forest in Ananthapur. Miyawaki Plantation, a revolutionary intervention towards increasing the greenery, climate amelioration and waste land development. By applying this technique the planted saplings grows 10 times faster and the forests grow 30 times denser in a given area. The method involves planting more number of varied tree species close together in a selected area.

Miyawaki Plantation

Akira Miyawaki plantation, plants having six months to one year is chosen to plant in the backyard of houses or open farm lands. With an objective to recreate biodiversity, a variety of plant species were planted in the selected area.

Miyawaki

- The native trees of the region are identified and divided into four layers — shrub, sub-tree, tree, and canopy.
- The quality of soil is analysed and biomass which would help enhance the perforation capacity, water retention capacity, and nutrients in it, is mixed with it.
- A mound is built with the soil and the seeds are planted at a very high density — three to five sapling per square meter.
- The ground is covered with a thick layer of mulch.

The Miyawaki Method is ideal for growing forests in a shorter period of about 20-30 years, including smaller green patches that grow in two years, unlike naturally-grown forests that may take more than 100 years to grow. These forests are known to be 30 times more dense, grow 10 times faster, have very little maintenance after two to three years of planting them, and don't require too much space.

The principle followed is that saplings when planted, various species and individual trees undergo their own natural process of natural selection through competition that results in the creation of a diverse forest. However, it is more care intensive at stages of plant selection and growth. The establishment cost of this model is Rs. 3 lakhs.

Gudibanda mandal – Miyawaki plantation at schools

Under CSV project, the staff has identified two areas, open spaces of government schools of P.C. Giri village (0.5 acre area) and Konkallu village (1 acre area) of Gudibanda Mandal by interacting with the local villagers, in charge of the schools and students. With the support of villagers, GP staff, VO staff, students and school headmaster, project staff was able to plant 8,800 plants in these two schools.

Firstly, the land was excavated with the hydraulic excavator with a 30 metre length, 2 metres width and half metre of depth. To plant, about 10 trenches were dug in each school. Organic material, a mixer of pulled out soil along with the rice husk and farm yard manure is applied to all trenches. The marking are done using white chalk powder to place the plants in their respective spaces with given spacing half feet distance between each plant. This forest consists of plants such as Seethaphal (Custard apple), Neem, Maredu (indigenous forest trees), Neredu (Jamun), Juvvi (indigenous forest trees), Maddi (indigenous forest trees), Narepa (indigenous forest trees), Mango, Amla, Teak, Pomegranate and more.

With a unique factor, plants have the ability to compete for its own food and nutrients from soil for its survival. Plants grow its roots deeper, stronger in search of nutrients and water making them well-built inside soil and outside above the ground.

Also the plantation is done in such a way that plants having different height and morphology is selected accordingly for planting (short, medium and tall growing plants). For instance, lemon plant is planted first,

which is short when compared to guava and jamun. The advantage of this method of plantation is the plants will grow three fold faster rates than usual period. For instance, the plantation after 10 years will look like a forest which is 30 years old. The greatness of this procedure is that every plant grows up to its Maximum length, by not affecting the growth of other plants.

Advantages of Akira Miyawaki plantation:

1. Increase of biodiversity
2. Improve soil fertility through beneficial microbial count in the soil
3. Elevates ground water table by harvesting rain water
4. Creates pleasant environment naturally
5. Improves air circulation and provides fresh air, reduces pollution
6. Increase the oxygen levels in the atmosphere
7. Develop a sustainable environment
8. A source of medicinal plants
9. Regenerates new plants through dispersal of seeds from the grown plantation
10. Supplies fodder to the livestock

Students from PC Giri Government School (Zilla Parishad Prathamika Unnatha Patashala) , "It's been 1 year 4 months we have established the plantation with 13 various plant species including native varieties belonging to fruits, flowers, creepers, and medicinal plants. This type of plantation helps the biodiversity grow and create a healthy atmosphere in and around our school premises. It is observed that around 30 per cent of plants (teak, timber, amla, tecoma stans, silver oak, almond, henna tree) have grown to more than 20 height feet, which is calculated as one foot per month. We have not used any chemical fertilizers instead we applied natural well decomposed farm yard manure for better growth of plants and protect our soils. So here we planted 2400 plants in just half acre of land. We are happy to observe a Mini forest growing in our school. We have adopted the plants and are taking care of it by weeding, providing timely irrigations and cleaning the area in the leisure timings. We as future generation have understood the importance of generating green cover, and will maintain the forest in the long run."

Students from Konkallu Government School (Mandala Prathamika Unnatha Patashala), "the forest was established 1 year 6 months ago. An 8 member subcommittee is formed at gram panchayat level, including village organization staff, school students and school staff to maintain the forest.

Around 24 varieties of forest and fruit saplings (4,600 plants) were planted in one acre of land. It is observed that the height of the plant is 25 feet.

Fruit plants such as lemon, guava, custard apple and ber have started fruiting. We are now able to have fresh fruits from the forest. We are also observing cool environment with fresh air, different bird species, honey bees and various kinds of butterflies in our school premises because of the forest. Sometimes few sessions are being taken by our teachers under the trees as the environment is cool and refreshing.

Though impressive results were obtained by Miyawaki technique of forest creation, the biotic factors including the soil fertility and native tree species were played a major role in biological growth."