



WADI SYSTEM

A TREE-BASED FARMING SYSTEM FOR SUSTAINABLE LAND AND ECOSYSTEM MANAGEMENT

A SLEM BEST PRACTICE

Indian Council of Forestry Research and Education has documented Wadi System – A tree based Farming System as one of the best practices for sustainable land and ecosystem management (SLEM) under the World Bank funded SLEM Project.

Wadi is a kind of tree-based farming system to promote agroforestry and has been practiced traditionally in India. The concept of Wadi includes an integrated approach of agriculture, horticulture and forestry systems and aims at promoting socio-economic empowerment of the communities as well as conservation of soil and water resources.

Wadi system promotes comprehensive economic development through enhancing agricultural productivity, efficient management of natural resources and developing social awareness. It also enhances financial security of the small and marginal farmers through integrated concepts of agriculture, horticulture, silviculture and animal husbandry at the local/ micro level.



Principles for implementation of Wadi System

- ▶▶ A 'Wadi plot' is a piece of family-owned land that is developed for agro-horti-forestry system along with soil and water conservation measures
- ▶▶ Private lands as well as common property lands/ community lands can be profitably utilized for establishment of Wadi plot
- ▶▶ Fruit trees are efficient enough in providing higher economic return even in growing under stress conditions prevailing under upland situation. Besides, inter cropping with agriculture crops, the Wadi plot can provide income from the very 1st year to the participating farm families
- ▶▶ Promotion of horticultural crops can create opportunities for post-harvest processing, marketing and employment generation, thereby reducing the occurrence of frequent migration
- ▶▶ Planting suitable multi-purpose forest trees encircling the fruit trees
- ▶▶ Developing live fence through planting of forest tree species
- ▶▶ Fruit trees and the crops grown as inter crops being the main sources of income

Factors for successful Wadi System

- ▶▶ Beneficiary should have minimum 1 acre of private land/common land having irrigation facility (individual wadi system). In case there is no irrigation facility, irrigation infrastructure can be developed in the form of check dams/water harvesting structures/well with pipe line connection. Land selected for Wadi should not have steep slope and undulating in nature.
- ▶▶ Ideally, Wadi system should be undertaken in cluster approach (collective approach). There should be 1000 Wadis confined to 10-15 villages per cluster.
- ▶▶ Handholding support through Community Based Organizations (CBOs) by providing technical inputs to each cluster.
- ▶▶ Capacity building and exposure visit of Wadi farmers to successful Wadi areas, and the maintenance and operations of Wadi must be undertaken for the capacity building programme of the farmers.
- ▶▶ At least one farmer's cooperative should be developed in each cluster and an apex cooperative as federation can be constituted at block/district level.
- ▶▶ Value addition should be promoted through installation of crop-specific village level efficient value chain.
- ▶▶ Other technical support interventions such as backyard poultry, dairy, vermi-composting, grafting, income generation activities and collective marketing should be encouraged in Wadi clusters.

Important points to be kept in mind while developing a plot of Wadi System

- ▶▶ Species wise distance between the plants (most popular being 5 x 5 metres)
- ▶▶ Adequate space should be there for inter-cultivation of remunerative crops like vegetables
- ▶▶ Maintaining suitable distance between the fence and the plants
- ▶▶ Region specific selection of manure and soil layers
- ▶▶ Suitable arrangement for protection of planted material

Main crops that can be planted under Wadi System

For laying out the wadi system on private land/ community land, suitable crop combination can be decided based on the climate, soil suitability and socio-economic preferences. Boundary plantation in orchard will be made by multipurpose forest species. Other livelihood interventions such as dairy, poultry and fishery can be practiced in the Wadi so as to substantiate the farm income.

- ▶▶ **Forest Species:** Bel (*Aegle marmelos*), Palash (*Butea monosperma*), Neem (*Azadirachta indica*), Jamun (*Syzygium cumini*), Mahua (*Madhuca longifolia*), etc
- ▶▶ **Fruit Species:** Improved varieties (Grafts to reduce gestation period) of fruits like Mango, Litchi, Sapota, Guava, Orange, Cashew Nut, Custard Apple, Aonla, Jack fruit, etc.

- ▶▶ **Agricultural, Grass and Vegetable Crops:** Intercropping with floriculture crops like jasmine and marigold, different offseason vegetables and suitable varieties of different field crops like pigeon pea, black gram, ground nut, cowpea, french bean, okra, up-land paddy, satavar, tomato, chilli, cucurbits and oilseeds etc. can be made in the orchard in the initial three years. Once the orchard becomes 4-5 years old, shade tolerant crops like ginger, turmeric, jimikand (elephant foot yam) can be intercropped with horticultural crops

- ▶▶ **Species for bio-fencing:** Sisal, Agave, Babul (*Acacia nilotica*), Mulberry (*Morus alba*), Dhak (*Anogeissus latifolia*), jatropha etc.

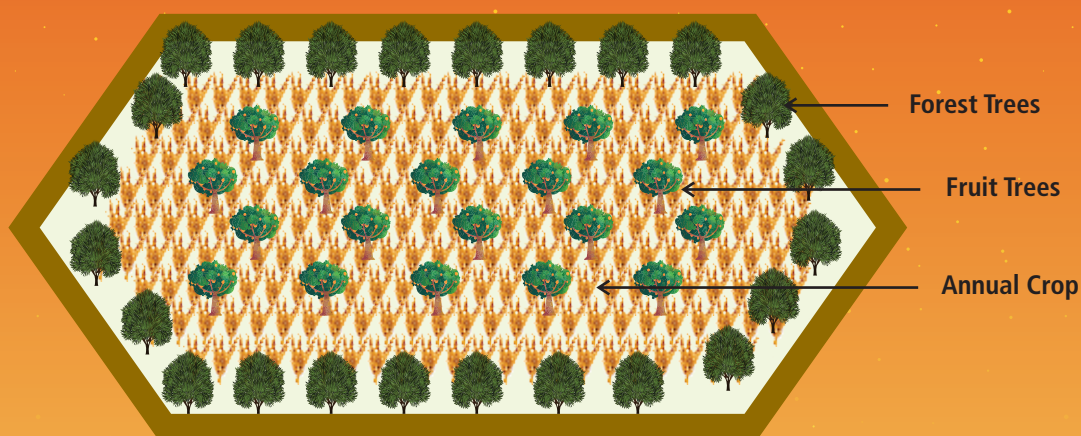


Benefits from Wadi System

- ▶▶ Very suitable for low productive lands and drought prone areas
- ▶▶ Ancillary and supporting soil and water conservation through the drains and low areas formed by bund building
- ▶▶ Improving soil productivity & enhancement of farmers' incomes through intercropping with pulses and vegetables
- ▶▶ A small pond can be constructed in every 2-3 hectares of Wadi area through cooperation and understanding between 2-3 farmers. These ponds where on one hand promotes the storage of rainwater besides groundwater recharge and on the other it also promotes the spirit of community participation through mutual cooperation
- ▶▶ There is considerable reduction in drudgery of women. Multiple agricultural products are available to them at their farm land which gives them more time and energy to live a healthy lifestyle and can devote more time towards education of their children
- ▶▶ Wadi system can also help in creating a platform for community action through village level people's forum. Empowerment of existing community-based institutions like Gram Panchayat, Self Help Groups, Joint Forest Management Committees through capacity building and awareness programs can also be achieved

A proper training of stakeholders (beneficiaries / farmers/ labours) for proper adoption of this practice is required.

Indian Council of Forestry Research and Education (ICFRE), Dehradun as Ecosystem Services Improvement Project Implementing Unit (ESIP-PIU) is building the capacity of the local communities of ESIP project areas of Chhattisgarh and Madhya Pradesh for upscaling of Wadi System – A tree based farming system: A SLEM Best Practice.



Different Components of 'Wadi System'

Brief About ESIP

The World Bank funded Ecosystem Services Improvement Project (ESIP) supports the goals of the Green India Mission by demonstrating models for adaptation-based mitigation through sustainable land and ecosystem management and livelihood benefits. ESIP will introduce new tools and technologies for better management of natural resources, including biodiversity and carbon stocks. Main components of the project are: strengthening capacity of government institutions in forestry and land management programs, improving forest quality, and scaling up of sustainable land and ecosystem management (SLEM) best practices. ESIP is being implemented in the states of Madhya Pradesh and Chhattisgarh by Indian Council of Forestry Research and Education, Chhattisgarh State Forest Department and Madhya Pradesh State Forest Department under the overall direction of Ministry of Environment, Forest and Climate Change, Government of India.

Brief About ICFRE

Indian Council of Forestry Research and Education (ICFRE) is an autonomous body of the Ministry of Environment, Forest and Climate Change, Government of India. It is an apex body in the national forestry research system that promotes and undertakes need based research, education and extension in the forestry sector. It has a pan India presence with its 9 research institutes (Arid Forest Research Institute, Jodhpur; Forest Research Institute, Dehradun; Himalayan Forest Research Institute, Shimla; Institute of Forest Biodiversity, Hyderabad; Institute of Forest Productivity, Ranchi; Institute of Forest Genetics and Tree Breeding, Coimbatore; Institute of Wood Science and Technology, Bengaluru; Rain Forest Research Institute, Jorhat and Tropical Forest Research Institute, Jabalpur) and 5 centers located at Agartala, Aizawl, Prayagraj, Chhindwara and Visakhapatnam. Each institute are directs and manages research, extension and education in forestry sector in the states under their jurisdiction.

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