



## **Integrated tree-based farming system for economic diversification & resilience building of small-holder farmers**

### ***1. Submitting organization:***

BAIF Development Research Foundation (1)

### ***2. Short description of the study:***

The case study will involve assessment and documentation of the socio-economic and environmental impacts of “Wadi” - a tree-based integrated farming system (Agri-Horticulture-Forestry system), an innovative approach evolved and upscaled by BAIF Development Research Foundation in India. The Wadi approach focuses on converting underutilized and degraded lands owned by small holder farmers into sustainable productive assets for the needy families. The impacts of the Wadi programme are clearly evident through various studies conducted. It is however essential to conduct a comprehensive multi-location study to assess the impact and derive learnings for wider dissemination to other programmes.

The Wadi programme involves integration of suitable fruit and forestry trees, intercropping, small plot cash crop cultivation, soil and water conservation and soil improvement activities. Fruit trees are planted at the center of the land, while forestry trees are planted along the periphery. The Wadi model provides sustainable livelihoods and builds resilience among the participating families through increased, regular farm income, diversity and productivity. It also improves the environment by improving natural resources, promoting various ecosystem services, carbon sequestration, promoting circularity and arresting land degradation.

The Wadi project involves planting fruit and forestry trees on farmers' lands. Emphasis is given on promoting indigenous and local tree species with multiple uses such as fruits, fodder, hardwood timber, non-timber forest products (NTFP), and fuelwood. Cover crops in the form of intercrops and small plot cash crops (e.g., vegetables, fruits, tubers) are encouraged in the spaces between the trees or adjacent to the plantations. Legumes are also be promoted as intercrops that help in soil improvement. The choice of crops depends on soil, land, and water availability, as well as the farmers' preferences. Site-specific measures for soil conservation and various organic practices such as green manuring, compost application, and in-situ composting are introduced to enhance soil health. Decentralized small and micro-water resources such as springs, group wells, ponds and small check dams are established to ensure water availability for drinking and protective irrigation purposes. To ensure that the farmers benefit from these initiatives, their capacities are built in establishing and maintaining the Wadis. This is done through seasonal trainings with field demonstrations for various seasonal and aftercare activities. In addition, to ensure that the farm produce receives appropriate value, farmers are organized into farmer producer organizations (FPOs). These organizations are facilitated to handle aggregation, processing, and marketing of the farm produce. The FPOs also are sensitized to help farmers access carbon markets, thereby benefiting from carbon finance. The Wadis are a source of



nutritious food such as vegetables, pulses, and fruits thereby contributing to health improvement. The key outcomes of the Wadi programme are summarized as under:

- Improved and diversified farming system.
- Significant increase in farm income for small holder farmers.
- Significant reduction in distress migration.

The Wadis also improve the biodiversity, improve the soil quality and carbon sequestration around 23 T C is sequestered per ha by a 10-year old Wadi.

The Wadi model therefore serves as a viable pathway for both human and eco-system well-being.

### ***3. Geographical Region:***

The case study aims at analyzing the impact of Wadi programme in creating improved and sustainable livelihoods for small holder families in 6 states of India, namely, Maharashtra, Gujarat, Rajasthan, Karnataka, Madhya Pradesh and Odisha. The marginal farmers in these regions struggle with limited access to resources and face a threat to their livelihoods. Majority of them practice subsistence-based rainfed agriculture. They suffer from low returns from agriculture due to small land holdings, land degradation, lack of awareness to advanced technologies, untimely, unpredictable and extreme weather events, low farm diversity and cropping intensity. These challenges often force them to resort to seasonal distress migration, which exacerbates poverty and leads to poor quality of life.

BAIF's Wadi programme is a sustainable solution to the variety of challenges as evidenced by past experiences. BAIF's Wadi programme has been implemented in many regions across India and impacted more than 0.22 million needy families with the Wadi-based agri-horti-forestry systems established on more than 89,000 ha. in twelve states of India. However, a comprehensive case study evaluating its social, economic and environmental impacts in detail has not yet been conducted involving multiple locations and different stages of the programme. With the support of KCI, BAIF is confident of developing a case study that will elucidate the positive impacts of the initiative and demonstrate its potential for replication on a larger scale, both nationally and globally.

### ***4. Area of climate policy:***

The Wadi programme involves an agroforestry based approach with focus on agriculture, horticulture and forestry, contributing to both adaptation and mitigation efforts. ;

### ***5. Short description of the policy(ies):***

The Wadi programme is in alignment with the Agroforestry policy and the National Horticulture Mission of India. The Wadi programme impacts various Sustainable development goals as well as has a significant contribution to the Nationally Determined Contribution (NDC) of India. Some of the direct contributions are in the terms of reducing land degradation/ achieving land degradation neutrality (89000 ha), carbon Sequestration (7.5 million tCO<sub>2</sub>), reducing poverty and promoting sustainable livelihoods (0.2 million families) and afforestation/ trees outside forests (40 million trees outside forests).



**6. *Work programme Area to be covered by the Study:***

Economic diversification and transformation; Assessment and analysis of the impacts of the implementation of response measures (with a view to understanding the positive and negative impacts);

**7. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the impacts to be studied:***

Social; Economic; Environmental;

**8. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the type of assessment (Qualitative/Quantitative/Both):***

Both

**9. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the methodology or tool used for impact assessment:***

The methodology adopted for the case study will involve a combination of qualitative and quantitative research methods. For developing the case study with KCI, BAIF will identify specific clusters of villages/blocks in the States of Karnataka, Rajasthan, Maharashtra, Madhya Pradesh, Odisha and Gujarat that has implemented the Wadi programme. To develop comprehensive insights from the case study, stratified random sampling will be employed to select the participant families for the impact study. Structured questionnaires will be designed to collect qualitative and quantitative data from the study area. FGDs and individual household surveys will be conducted to understand the outputs, outcomes and impacts of the Wadi programme from economic, social, and environmental perspectives. Modern tools will be used for data collection and analysis of the data. Further, the findings from the regions of study will be compiled into a comprehensive report. The impact assessment will help in identifying the positive impacts, opportunities generated due to the Wadi programme implementation as well as finding out the gaps, challenges and scope of improving the programme.

**10. *Status of proposed case study:***

Case study has not been undertaken and will be developed in collaboration with the KCI

**11. *If the case study is completed and published, link to the case study:***

Not applicable.

**12. *Elaboration on how the submitter would contribute to the development of the case study:***

BAIF will extend its support for undertaking the study through providing / developing the list of participants in the list of villages identified for the study. BAIF will also deploy its human resources for the study against the financial support it receives for the study. Human



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resources will be deployed by BAIF for data collection, conducting focus group discussions, data analysis and for developing the case study.