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Investing in a Sustainable Tomorrow





Climate change exacerbates the effects of poverty, inequality, and overexploitation of natural resources, putting rural communities in a position of greater vulnerability. Rural households rely heavily on climate-sensitive activities such as farming, livestock rearing, and gathering of non-timber forest produce. All such activities are strongly linked to the availability of fresh water; temperature, humidity, and rainfall patterns; quality of soil and access to commons and pastures; and smart management of natural resources. Climate change impact can, therefore, have adverse implications on the livelihood and survival options of rural households. The impact manifests differently across different agro-climatic zones of the country, necessitating customised interventions to cope with specific risks in each area.

NABARD is seized of the enormity of the challenge and works actively in the space of climate change adaptation and impact mitigation by providing assistance to tribal families for raising wadis (orchards), supporting participatory watershed and soil management projects, and funding and implementing other sustainable solutions that can improve human lives without endangering the environment.

3.1 CLIMATE ACTION

NABARD is the national implementing entity for the Adaptation Fund under the United Nations Framework Convention on Climate Change (UNFCCC) and National Adaptation Fund for Climate Change, and the Direct Access Entity (DAE) for the Green Climate Fund (GCF) under the UNFCCC. In this role, NABARD has been channelling funds for a variety of interventions towards mitigating the effects of climate change.

3.1.1 Overview

As on 31 March 2024, there are 40 climate change projects at different stages of completion with a total financial assistance of ₹1,971.56 crore (Figure 3.1, Showcase 3.1).

3.1.2 Initiatives in FY2024 for better project implementation

A. Policy landscape

- The policy framework and operational guidelines for ‘green taxonomy’ were issued. This will help in the systematic classification of NABARD’s development and business portfolio as ‘green’ and lead to the prioritisation of investments and mobilisation of resources.
- NABARD has initiated the process for transitioning towards corporate net zero.

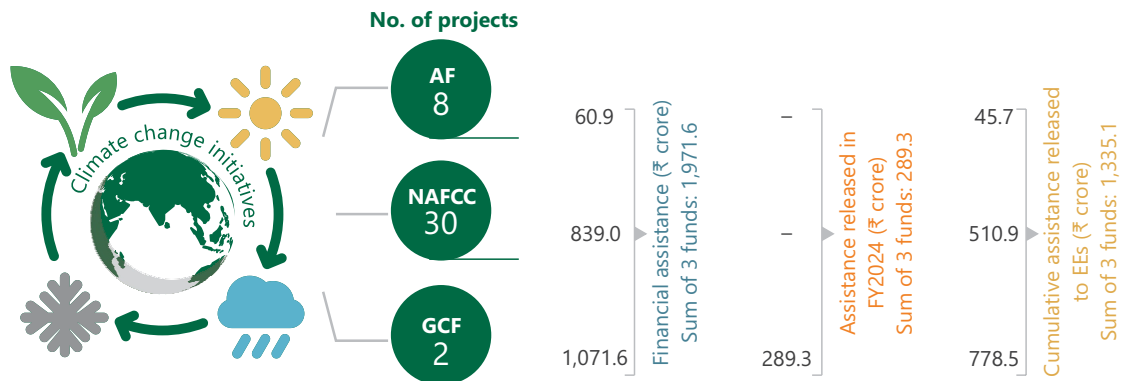
B. Climate finance

- Climate Change Fund–Interest Differential was created in FY2023 through allocation of the interest differential generated. This will enable NABARD to support innovative small and mid-sized adaptation projects and explore new financial tools and models.
- NABARD was re-accredited as DAE to the GCF, enabling access to funds.
- The development of new green products is underway—climate-resilient dairy, solar agri-pump sets, rural electric mobility, energy efficiency in value chain, rural home loans bundled with rooftop solar, etc.
- The process was initiated for identifying and financing state-level projects based on the respective State Action Plan on Climate Change.

NABARD supports sustainable climate change adaptation and mitigation solutions to improve human lives.



Figure 3.1: Overview of climate change initiatives by fund type



Project types



AF funded

- Projects completed:** 6
- Sectors**
 - Water
 - Coastal management
 - Agriculture and food security
 - Forestry
- Aggregate assistance**
\$9.9 million



NAFCC funded

- Projects completed:** 18
- Project distribution across sectors**
 - Climate resilient agriculture (45%)
 - Water management (26%)
 - Forest and ecosystems (13%)
 - Livestock management (9%)
 - Coastal ecosystem management (7%)
- Geography**
 - 26 states, 2 UTs
 - 130 districts



GCF funded

- Mitigation project**
 - \$250 million TFO (including \$100 million loan component)
 - Sanctioned to TCCL, now merged into Tata Capital Ltd.
- Adaptation with mitigation co-benefits project**
 - \$166.30 million TFO (including \$34.4 million grant component)
 - Implemented in tribal areas of Odisha

AF = Adaptation Fund, EE = Executing Entity, GCF = Green Climate Fund, NAFCC = National Adaption Fund for Climate Change, TCCL = Tata Clean Tech Capital, TFO = Total Financial Outlay, UT = Union Territory.

Notes:

- Adaptation Fund includes two readiness grant projects, namely, South-South Co-operation Grant for supporting national implementing entity accreditation in Afghanistan and Readiness Grant for development of environmental, social, and governance framework.
- Figures in parentheses under NAFCC-funded projects by sector represent share of the sector in total number of NAFCC projects.

Showcase 3.1: Building resilience through water harvesting

Project: Mukhyamantri Jal Swavlamban Abhiyaan (MJSA) for Climate Change Adaptation and Water Harvesting

Implementing agency: Department of Watershed Development and Soil Conservation, Government of Rajasthan

Area covered: Arthuna, Anandpuri, and Sajjangarh blocks of Banswara district in Rajasthan

Total financial outlay: ₹25 crore

Name of the fund: National Adaptation Fund for Climate Change

Challenges

- Groundwater level in over 8% blocks in Rajasthan is in 'overexploited or critical' zone.



1,840 water harvesting structures were created, storing about 2,644 thousand cubic metre of water.

- As water table is continuously going down, a significant part of the agricultural land is being forced to revert to rainfed farming.
- Much of the rainwater is wasted as run-off instead of replenishing the water table.
- According to the vulnerability assessment report of the Central Research Institute for Dryland Agriculture, Banswara is classified as a ‘very highly vulnerable district’.^a



Drone image of Bijalpur Haliya village showing various percolation tanks

Intervention: A total of 1,840 water harvesting structures, including anicuts, earthen check dams, mini percolation tanks, pucca check dams, percolation tanks, etc., were created under the project, which are storing about 2,644 thousand cubic metre of water. The water stored in these structures is being used for life-saving irrigation, normal irrigation in the kharif season, and pre-sowing irrigation in the rabi season.

Output>>Outcomes>>Impact

- **Beneficiaries:** All residents of the three blocks of Banswara covered under MJSA-II & III and Rajiv Gandhi Jal Sanchay Yojana-I.
- **Generation of non-recurring employment:** 53,015 person days (including 21,200 woman days) over the project duration.
- **Livelihood from horticulture:** 7,200 recurring person days (50% woman days), wherein the farmers were engaged in vegetable cultivation for 90 days in a year.
- **Increase in arable land:** Area under cultivation increased by 15%.
- **Availability of water:** Water in harvesting structures is available for irrigation, drinking, and domestic purposes. Groundwater table has risen by 1.5–2 metre in the project area. Before the project, water was available for 3–4 months after monsoons; it is now available for 4–5 months after rains.



Project: Anicut Bhamri, Padla Mokha village

^a Rama Rao, C.A., Raju, B.M.K., Islam, A., Subba Rao, A.V.M., Rao, K.V., Ravindra Chary, G., Nagarjuna Kumar, R., Prabhakar, M., Sammi Reddy, K., Bhaskar, S. and Chaudhari, S.K. (2019). Risk and Vulnerability Assessment of Indian Agriculture to Climate Change, ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, Page 80. <http://www.nicra-icar.in/nicrarevised/images/publications/Risk%20&%20vulnerability%20assessment%20of%20Indian%20agriculture%20to%20climate%20change.pdf>.



C. Other initiatives

- A technical support unit was set up at NABARD, with support from Asian Development Bank (ADB), Bill & Melinda Gates Foundation, and Intelicap Advisory Services to assist NABARD in its climate finance efforts.
- NABARD signed memoranda of understanding (MoUs) with the Ministry of Agriculture and Farmers Welfare and the International Institute for Environment and Development for the implementation of the voluntary carbon market framework for the agriculture sector in India.
- An MoU was signed with the Government of Goa and the World Bank for supporting the blended finance facility being set up by the Government of Goa.
- Collaboration with NABARD Consultancy Services was initiated on the carbon credit framework to support smallholder farmers in NABARD's natural resource management projects.
- The Green Literacy Programme designing process was initiated.
- International partnerships during the year were as follows:
 - ◇ NABARD took over the hosting of the Data in Climate Resilient Agriculture, a digital public good for digital innovations in agriculture and food systems, from the United Nations Development Programme.
 - ◇ Post the Conference of the Parties of the UNFCCC (COP28), dialogue was initiated with multilateral development banks and international agencies—ADB, Agence Française de Développement, European Investment Bank, Food and Agriculture Organization of the United Nations (FAO), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Japan International Cooperation Agency, Western Sydney University (WSU), and the World Bank—for collaborative action.
 - ◇ Actions included:
 - ♦ exploring green finance facility for India with support from ADB and GCF;
 - ♦ working on draft preliminary project report for support from the World Bank;
 - ♦ collaboration with FAO for joint project development for GCF funding;
 - ♦ collaboration with WSU for piloting village groundwater cooperatives for groundwater governance;
 - ♦ securing GIZ support under Climate Adaptation and Finance in Rural India-II project involving €1.5 million technical collaboration.

MoUs on voluntary carbon market framework with Ministry of Agriculture and the International Institute for Environment and Development.

3.2 WATERSHED DEVELOPMENT PROGRAMME

NABARD has been at the forefront of the participatory approach of watershed development since 1992. The Watershed Development Fund (WDF) was set up in NABARD during 1999–2000 with corpus of ₹200 crore contributed equally by Government of India and NABARD.

Till date, NABARD has sanctioned 3,747 watershed development projects with a cumulative disbursement of ₹2,245.3 crore, covering an area of 27.1 lakh hectare (ha). During FY2024, 74 new watershed and related projects were sanctioned covering an area of about 64,200 ha and an amount of ₹116.6 crore disbursed.



Box 3.1: Credit flow in watershed development projects

The Watershed Development Programme has benefitted communities through soil and moisture conservation, higher productivity, climate proofing, and by providing alternative livelihoods, besides ensuring the security and sustainability of existing livelihoods. To evaluate the impact of programme interventions on credit flow, a quick study was conducted across 19 states covering 34 watershed projects spanning 198 villages and 35,236 hectare. The study indicates:

- increase in credit flow across 19 states, with significant increase observed in Tamil Nadu, Andhra Pradesh, Karnataka, Telangana, Maharashtra, Chhattisgarh, and Bihar;
- nearly threefold increase in credit flow, from ₹81.9 crore (pre-project) to ₹220.8 crore (post-project);
- increase in credit flow per watershed by 170%, from ₹2.4 crore (pre-project) to ₹6.5 crore (post-project);
- fivefold increase in agriculture term loans from ₹4 crore to ₹20 crore;
- doubling of crop loan accounts from 7,468 to 14,665; and
- increase in credit flow to self-help groups from ₹19 crore to ₹30 crore.

3.2.1 Restoration and rehabilitation of degraded soils for food security

The NABARD–KfW soil project ongoing since 2017, with support from SEWOH,¹ incorporates issues of climate change adaptation in watersheds threatened by degradation, by improving soil health through climate sensitive investments (Box 3.2, Figure 3.2, Showcase 3.2).

Box 3.2: Impact evaluation study—KfW Soil Phase II

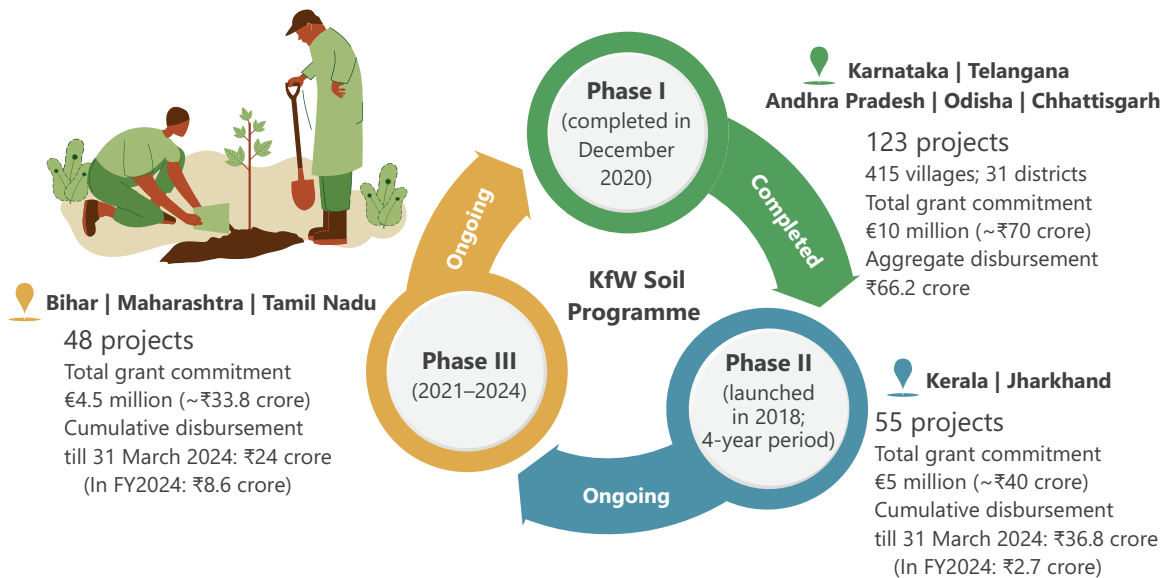
ICAR-Central Research Institute of Dryland Agriculture conducted an impact evaluation study in 15 watershed projects covered under the KfW Soil Phase II Programme. The highlights from the study are given below:

- Over 80% of respondents reported improvements in groundwater recharge.
- Most watersheds reported a satisfactory financial rate of return of over 20%.
- Post-project *normalised difference vegetation index* values (as evaluated from satellite images) in watersheds of Kerala consistently exceeded 0.4, indicating green cover and good resilience to climate change.
- Over 90% of farmers gained access to drinking water post-project, and sanitation coverage in Jharkhand increased to over 95%.
- 50%–82% of farmers benefitted from convergence with other developmental schemes/agencies.
- Over 80% of farmers were trained in precision farming, organic farming, water management, financial inclusion, integrated farming systems, pest and nutrient management.
- Significant improvement in soil organic carbon was observed.
- Additional soil and water conservation measures led to improved water resources, expanding area under irrigation.

The Watershed Development Programme has benefitted communities through soil and moisture conservation, higher productivity, climate proofing, and by providing alternative livelihoods, besides ensuring the security and sustainability of existing livelihoods.



Figure 3.2: Soil restoration and rehabilitation initiative under KfW Soil Programme



IMPACT OF KFW SOIL PROJECT

59,275 farmers

- undertook soil testing
- received soil health cards
- applied micro and major nutrients, organic manure, fertilisers, gypsum, etc., accordingly

1,14,515 farmers trained across 5,687 programmes on

- climate change adaptation
- organic farming
- sustainable agriculture
- soil sample collection
- soil health cards
- integrated farming
- crop diversification

49,570 ha under additional soil and water conservation measures

48,122 ha under soil improvement and productivity enhancement measures

23.5% increase in average annual income of farmers

62,612 beneficiaries receive weather-based agro-advisories 26 days a month

ha = hectare.

Notes:

- Phase II programme was extended till December 2023 due to the COVID-19 pandemic.
- The exchange rates for the three phases were not the same.

Showcase 3.2: Crop production using low-cost poly house

Project: Support for horticulture farming in low-cost poly house under the KfW Soil Project

Location: Bara Sarsa village in Karanghati Watershed, Pakur district, Jharkhand

Challenge addressed: Low yields and unpredictable monsoons leading to poor farmer income

Interventions

- Provision of training and support to the beneficiary for setting up the low-cost poly house
- Provision of drip irrigation facilities, mulch, fertilisers, and need-based plant protection inputs
- Guidance to the beneficiary on marketing of poly house produce
- Support for the adoption of agronomical practices



Farm produce



Low-cost poly house

Output>>Outcomes>>Impact

- Risks of pest and disease infestation reduced and good crop yields achieved
- Around 25 kg of capsicum and 15 kg of strawberry harvested after an expenditure of ₹5,000 on poly house construction
- Income of ₹21,000 earned resulting in a net profit of ₹16,000 in 70 days
- Compost tank constructed enabling composting of post-harvest biomass rather than burning of crop residue

3.2.2 Springshed development programme

Springshed-based watershed development to rejuvenate drying springs primarily in the Himalayan and North East Region (NER) has led to augmentation of drinking water supply and promoted off-season farming for the rural communities in these fragile ecologies. As on 31 March 2024, 157 springshed development projects have been sanctioned with a cumulative disbursement of ₹24.9 crore in the NER and other hilly areas of Sikkim, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, and Uttarakhand. During FY2024, 14 new springshed projects were sanctioned and an amount of ₹6.8 crore disbursed.

3.2.3 Geospatial technology-based monitoring

NABARD Bhuvan Portal

To promote digitalisation of watershed and related projects, NABARD Bhuvan Portal, a geospatial platform, has been developed in association with National Remote Sensing Centre, Indian Space Research Organisation.

Hosting a large database of geotagged assets, the NABARD Bhuvan portal enables easy mapping, end-use monitoring, progress tracking, carbon credit accessing, and evidence-based impact evaluation of watershed projects.

Cumulatively, as on 31 March 2024, 1,125 projects have been onboarded to the portal and 1.7 lakh assets geotagged. The Bhuvan portal has been migrated to the server hosted by NABARD.

The NABARD Bhuvan portal hosts a large database of geotagged assets that enables easy mapping, end-use monitoring, progress tracking, carbon credit accessing, and evidence-based impact evaluation of watershed projects.

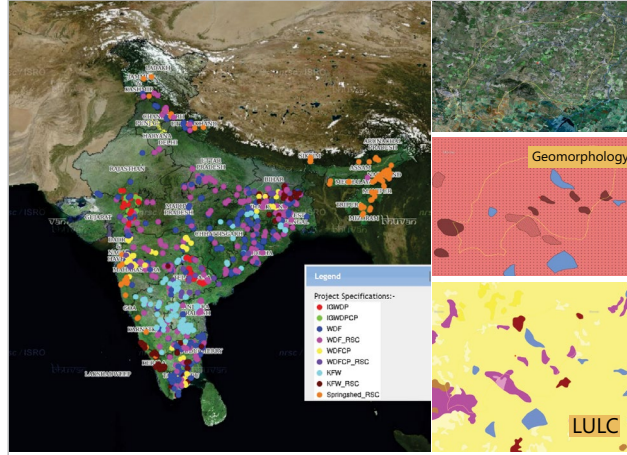


Geospatial technology-based detailed project reports for watershed projects

Geospatial technology is also being used to make watershed planning more streamlined, efficient, effective, and transparent. Open source data and tools such as QGIS, Google Earth, Bhuvan, WRIS, etc., are being used for groundwater potential mapping and land capability classification.

In FY2023, three detailed project reports were prepared on pilot basis using geospatial techniques in Maharashtra, Odisha, and Telangana. In FY2024, with capacity building support from GIZ, the approach was seamlessly upscaled across Andhra Pradesh, Karnataka, Tamil Nadu, Telangana, and Madhya Pradesh, as also in Maharashtra and Odisha, with 14 implementing agencies.

Figure 3.3: A snapshot of NABARD Bhuvan Portal and Thematic Layers

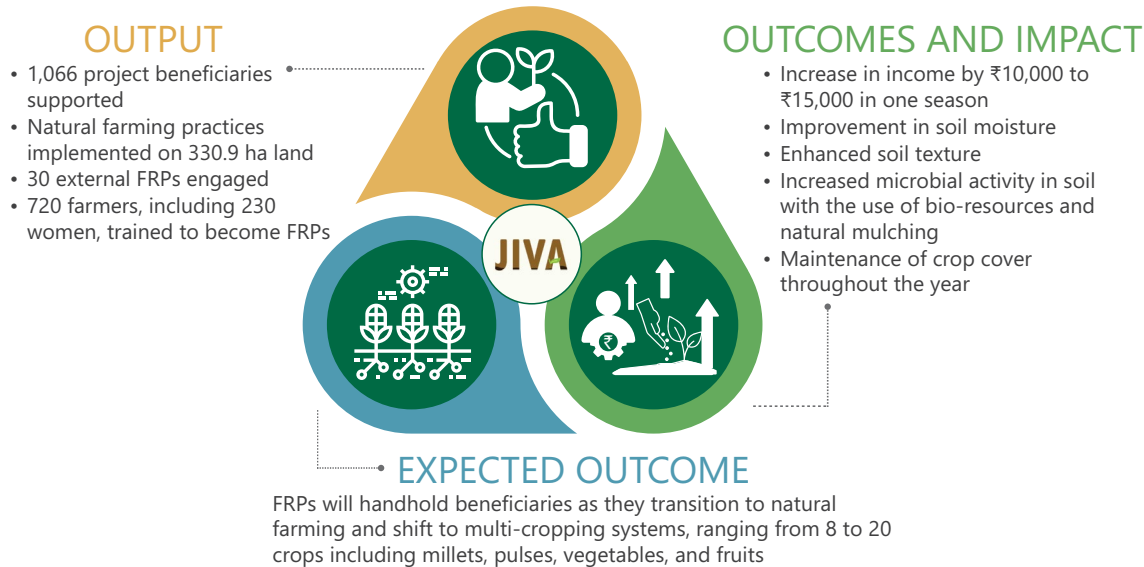


CP = Climate Proofing, IGWDP = Indo-German Watershed Development Programme, WDF = Watershed Development Fund, RSC = Remote Sensing Cell.

3.2.4 JIVA—Agroecology Programme

Currently, 24 JIVA projects are being implemented across 11 states, including watershed and tribal (wadi) areas, covering five agroecological zones in vulnerable rainfed areas (Figure 3.4, Showcase 3.3).²

Figure 3.4: JIVA, Output>>Outcomes>>Impact (as on 31 March 2024)



JIVA, an agroecological transformation programme, was launched to pioneer and scale up agroecology as a strategic and transformational approach in watershed and wadi projects, leveraging the pre-existing natural and social capital.

FRP = Farmer Resource Person.

Note: External FRPs engaged through Rythu Sadhikara Samstha, Andhra Pradesh Community Managed Natural Farming with support from GIZ.



Showcase 3.3: Sowing success through an integrated farming system

Project: Mallaigudem JIVA project

Implementing agency: Watershed Support Services and Activities Network

Location: Bhadradri Kothagudem district, Telangana

Challenges: High input costs, high dependence on chemical pesticides and fertilisers, low production, lack of knowledge about inter-cropping systems, unhygienic shelter for livestock, and open grazing of animals.

Intervention: The project promoted the adoption of principles of natural farming, multi-layer farming, eco-farm pond, and livestock integration. It entailed a spectrum of practices, from bio-stimulant preparation to botanical extractions, fostering healthy crops, and enhancing soil fertility.

Impact

- Financial stability and all-year crop cultivation
- Production of a variety of crops, including vegetables, fruits, and fish farming
- Increase in milk production with the availability of perennial green fodder
- Construction of a desi poultry breed farm and cattle shed underway
- Knowledge sharing among fellow farmers representation of the project at prestigious events

3.3 TRIBAL DEVELOPMENT FUND

Since 2004, NABARD has been supporting tribal households to raise wadis towards sustainable livelihoods and environment under its Tribal Development Fund (TDF). Since 2019, for greater inclusivity, empowerment, and upliftment of tribal communities, TDF has expanded its scope beyond orchard farming to support other activities like sericulture, apiculture, animal husbandry, lac cultivation, eco-tourism, pisciculture, micro-enterprise development, etc.

TDF has supported 1,026 projects since inception, benefiting 6.3 lakh tribal families living across 5.9 lakh acre in 29 states and Union Territories.

3.3.1 Performance of the fund

The fund has supported 1,026 projects since inception, benefiting 6.3 lakh tribal families living across 5.9 lakh acre in 29 states and Union Territories. Of the cumulative financial commitment of ₹2,839 crore, ₹2,054 crore has been disbursed as on 31 March 2024. During FY2024, 59 new projects were sanctioned. Cumulatively, approximately 2.9 crore trees have been planted across India through the tribal development programmes.



Showcase 3.4: From hardship to hope: Crop diversification and irrigation solutions

Project: Integrated Tribal Development Project

Location: Zaheerabad Mandal of Sangareddy district, Telangana

Implementing agency: SCOPE

Project outlay: ₹218.8 lakh

NABARD grant: ₹198.8 lakh

Challenge

- Rainfall dependency and mono-cropping leading to high risk and low income agriculture

Interventions

- Promotion of horticultural crops, primarily mango and intercropping with pulses and vegetables
- Installation of ring tanks, bore wells, and submersible pump sets

Output>>Outcomes>>Impact

- 500 acres placed under horticulture farming
- 115 additional acres under irrigation
- ₹50,000–₹70,000 rise in annual income from mango cultivation per farming household by the fourth year
- Surge in crop productivity
- Rise in average income per beneficiary from ₹0.3–₹0.4 lakh per annum to ₹1.01–₹1.68 lakh post-project
- Reduction in migration rates from 30% to 20%
- Opening of savings accounts by all beneficiaries
- Proliferation of community-based organisations, including self-help groups and farmers' clubs, fostering local empowerment
- Convergence with government schemes, enabling access to agricultural inputs, drip irrigation facilities, and increased employment opportunities under Mahatma Gandhi National Rural Employment Guarantee Act



Enhanced production



Mango orchard, aerial view

Convergence with government schemes, enabling access to agricultural inputs, drip irrigation facilities, and increased employment opportunities under MGNREGA

Box 3.3: Impact evaluation of TDF project in Wayanad, Kerala

Major highlights from an impact evaluation study conducted by the Centre of Agroecology and Public Health, University of Kerala, of a Tribal Development Fund (TDF) project located in Poothadi block of Wayanad district implemented by M.S. Swaminathan Research Foundation are as follows:

- **Agriculture income:** Annual income from agriculture per household increased from ₹19,435 to ₹60,249.
- **Allied sector income:** Revenue from dairy, goatery, and poultry among landless families increased from ₹35,000 to ₹60,000 annually.
- **Adoption of organic farming:** Organic coconut, cashew, cocoa, pepper, ginger, and turmeric produced is being marketed through the agency called Organic Wayanad, locally known as Vanamoolika.
- **Market linkage:** Participating farmers formed the Wayanad Agri Marketing Producer Company Limited which sold their produce in nearby towns, improving both market linkage and returns.
- **Standards of living:** Standards of living have improved with safe roofing of houses, better access to electricity, and safe drinking water and sanitation facilities.

3.3.2 Major changes in TDF in FY2024

- Per family grant has been increased to ₹75,000 for general areas and ₹81,000 for NER, hilly, and difficult areas.
- An amount of ₹25 lakh per project can be sanctioned over and above the TDF grant for implementing a sustainability plan to ensure perpetuity of benefits.
- While identifying and implementing new projects, Particularly Vulnerable Tribal Groups, aspirational districts/blocks (as per NITI Aayog), and credit-starved districts (as defined by the Reserve Bank of India) will be prioritised.
- Additional support is being provided to establish nutri-gardens in the backyards of project beneficiaries to supplement both family nutrition as well as income through the sale of surpluses.

3.4 TOWARDS ACHIEVING HARMONY WITH NATURE

Taking cognizance of the trade-off between development and the environment, NABARD has been championing diverse strategies to address the impacts of climate change while promoting sustainable livelihoods and development. In line with global and national priorities and India's commitment to net zero emission by 2070, NABARD continues to devise, support, finance, and promote a wide range of initiatives aimed at mitigating the effects of climate change, adaptation to climate change impact, awareness generation, and knowledge sharing.

NOTES

1. KfW Soil Project = Integration of Watershed Development Strategies for Rehabilitation of Degraded Soils with Climate Change Adaptation; SEWOH = The 'One World, No Hunger' initiative of the German Federal Ministry for Economic Cooperation and Development (BMZ).
2. <https://www.nabard.org/about-departments.aspx?id=5&cid=470#:~:text=JIVA%2C%20an%20agro%2Decological%20transformation,existing%20natural%20and%20social%20capital.>

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