नाबार्ड

Success Stories

Watershed Development

Fostering Economic, Environmental & Social Empowerment

नाबार्ड

National Bank for Agriculture and Rural Development
Plot No. C-24, G Block, Bandra-Kurla Complex, Bandra (E), Mumbai - 400 051
www.nabard.org/nabardonline











Soil & Water Conservation

Voluntary Shramdaan - Exemplifying Peoples' Participation

Nagathihally Watershed

Location :

Ittigehally Village, Chitradurga District, Karnataka

Facilitating Agency/NGO :

Society for Public Education, Environment, Culture, and Health (SPEECH)

"The Nala is now full of water and it has become a major source of drinking water for the livestock population. The villagers are filled with immense joy.

Nagathihally Watershed, consisting of six villages in Chitradurga District of Karnataka State has an animal population of more than 2 lakh. Villagers were predominantly dependent on animal husbandry for their livelihood. Due to drought since last five years, there was huge scarcity of water for animals, resulting in high animal mortality rate.

During Net planning/PRA exercise, villagers and VWC members discussed this issue. It was observed that during the rainy season, water was flowing down with high velocity to 'Vanivilas Sagara Dam' from the ridge point in Ittigehally village. They requested PFA to plan for construction of water harvesting structure in Ittigehally village to conserve this water for their animal population.

PFA, Society for Public Education, Environment, Culture, and Health (SPEECH), and VWC, as a part of climate proofing measures, planned to construct Nalabund - 25 feet in height and 250 metres in length under NABARD KfW Soil project.

The estimated cost of the structure was about ₹ 13.68 lakh. NABARD sanctioned ₹ 7.50 lakh, another ₹ 4.98 lakh was planned through convergence support from MGNREGA, and further ₹ 1.2 lakh was proposed to be raised from peoples' contribution through Shramdaan (Voluntary Labour).

- NABARD released the amount as per the sanction but MGNREGA failed.
- Major challenge was to complete the work within the allocated funds of NABARD and through Shramdaan.

District Development Manager (DDM) of NABARD, Smt. M. S. Suvarna, has been actively involved in the project since net planning. Though the Nala bund activity was going to benefit the entire project area populace, the locals initially did not come forward for Shramdaan. DDM, along with the PFA, had to visit the project site on several occasions to counsel and motivate the locals, who then responded wholeheartedly. The locals came forward and completed the Nala bund work through Shramdaan. This important infrastructure has now stretched to 300 metres instead of 250 metres; originally planned.

Highlights:

- Ultimately, the structure was built through NABARD support and Shramdaan, within 6 months.
- The Rain gods blessed the villagers and the entire water structure was full of water due to adequate rain in September 2017.
- Fishery Department released 16,000 fish fingerlings in Nala bund.
- Nagathihally VWC Member R. Raghunath was felicitated by Shri Govindappa, MLA Hosadurga for his dedicated involvement in Nala bund construction and also for encouraging others to participate. Taluk MLA, elected members, officers from various departments and Panchayat Raj performed "Ganga Pooja" ceremony thanking the Rain gods for their abundant blessings.
- All the borewells in and around Nagathihally watershed in a radius of 50 Kms have been recharged.

2 lakh
animals and six villages
are self-sufficient in water

Plenty of Water, Plenty of Crops & Livelihoods

Tyma Watershed

Location :

Tyma Village, Ramgarh District, Jharkhand

Facilitating Agency/NGO :

Professional Assistance for Development Action (PRADAN)

> "The water did not dry up during the first year and was almost double than the previous year. This gave us more confidence, helped us in enhancing income and made us believe in settled cultivation and irrigated agriculture, says Bahadur Tanti, Member of the Watershed Committee.

Tyma Watershed project in Ramgarh district of Jharkhand was initiated and completed by NGO Professional Assistance for Development Action (PRADAN) under the WDF programme.

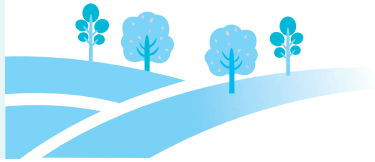
Agriculture is the main source of livelihood in the villages of the watershed. Earlier, farming was primarily rainfed and paddy and maize were the major crops. Low productivity resulted into net shortage of foodgrains in majority of the households.

As part of this project,

- 54 SHGs were promoted with net owned fund of ₹ 19.79 lakh.
- Of these, 44 SHGs were linked to the banks and loans worth ₹ 23.08 lakh were mobilised.
- 30x40 sq. ft. sized farm pond models were built in 24 hectares of land.
- Farm bunding was done in 133.16 hectare land to reduce soil erosion and increase groundwater recharge.
- 27 new ponds were constructed and 9 old structures were renovated for storage of 97,200 cum of runoff water.
- Water absorption trenches measuring 1,484 running metre were constructed.
- 33.71 hectares of agro forestry and 10.57 hectares of orchard were developed.

The watershed initiatives have resulted in increase in net sown area, going up from 428.50 hectares to 625.25 hectares. Furthermore, the area under double cropping has increased from 60 hectares to 309 hectares.

Average income from vegetable cultivation has increased from ₹ 50,000 to ₹ 60,000 along with an additional income of ₹ 12,000 by way of fish farming in the farm ponds. Cropping intensity has risen from 115% to 160%. Enrolment of students in schools has increased to 82% from earlier level of less than 50%. Water level has doubled in the renovated farm ponds, increasing farmers' confidence and belief in settled cultivation and irrigated agriculture.



625.25 hectares
Current net sown area vs 428.50 hectares pre-intervention

From **115% to 160%**
increase in Cropping Intensity

Positively Impacting the Land-Use Pattern

Khangela Watershed

Location :
Khangela, Dahod District, Gujarat

Facilitating Agency/NGO :
Foundation for Ecological Survey (FES)

> "Better cropping systems ensuring higher cash flows, bringing additional area under sustained irrigation, and reduced production risks - the impacts of watershed projects in Khangela are immense.

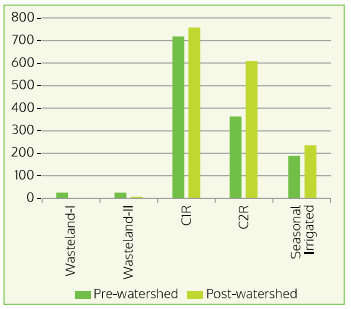
Located in the Kali river basin of Dahod District of Gujarat, the Khangela Watershed has a total catchment area of 1,249 hectares and an undulating topography. Situated close to the border of Madhya Pradesh, the watershed comprises 11 hamlets of more than a thousand total households.

Absence of irrigation facilities and inadequate and erratic rainfall exposed the villages to regular droughts. The tribal-dominated population failed to earn a steady income. Further, the production of foodgrains, even in a good rainfall year, met only the subsistence requirements for six to eight months of the year. In such vulnerable circumstances, migration became inevitable to make the ends meet.

NABARD initiated watershed interventions in the area using the concept of 'Catch the rain where it falls'. This was done to prevent runoff and consequent soil erosion and also to promote soil and water conservation.

Watershed treatment was undertaken after proper consideration of existing land use of the fields and their land capability classification. The measures were aimed at conversion of the single-cropped rainfed area into double-cropped rainfed area without compromising on land capability. With the interventions, there has been an increase in year-round cultivation. Earlier, crops were cultivated only in Kharif season, but now the area cultivated during Rabi has also increased considerably. Better cropping systems ensuring higher cash flows, bringing additional area under sustained irrigation, and reduced production risks - the impacts of watershed projects in Khangela are immense.

Change in Land-Use Pattern of Khangela Watershed



CIR: single-crop rainfed area; C2R: double-crop rainfed area

247 hectares
Converted to double-cropped area from single-cropped area

44 hectares
Increase in seasonally irrigated area

39.43 hectares
Converted into arable land

Participatory Watershed Management Mushrooms Income Opportunities

Mahijor Watershed

Location :

Kutenpadar Village, Kalahandi District, Odisha

Facilitating Agency/NGO :

AFC India Ltd.

> Bana Devi, a SHG member, expressed gratitude to AFC and NABARD for helping her with mushroom cultivation, which raised her family status and increased her bank savings to ₹ 60,000.

Mahijor Watershed in Kalahandi District of Odisha comprises 1,012.67 hectares spread over three villages, namely Kutenpadar, Sukunabhata and Mahijor. AFC India Ltd., under the funding support from NABARD, undertook the responsibility to implement the watershed interventions.

The watershed area falls in one of the most backward regions of the country. It receives meager rainfall in the monsoon months and is prone to droughts. Rain-fed agriculture and daily wage manual tasks are the primary occupations in this area. High incidence of poverty and migration during lean season are common problems. On the other hand, rich forests, availability of labour and close proximity to the district headquarters; thereby providing an all-weather market for agricultural produce are the positives of this area.

As part of the watershed interventions, community participation was encouraged to conserve and manage the natural resources. Runoff water was controlled to recharge the groundwater table. Further, to increase the moisture availability to the agricultural crops, in-situ moisture conservation techniques were adopted.

Due to the various soil and water conservation efforts, water table in the villages improved from 25ft to 18ft, in the wells. New livelihood activities such as mushroom farming, backyard poultry and vegetable cultivation were also created owing to the watershed interventions.

Training to SHG members and exposure visit to nearby villages, where mushroom was cultivated, were organised by PFA. Further, AFC India Ltd. provided ₹ 5,000 from VWDC livelihood fund to the SHGs. After getting good profit, all members took up the Income Generating Activity (IGA) of Mushroom cultivation in their backyard and started getting good seasonal income. Bana Devi, a SHG member, expressed gratitude to AFC and NABARD for helping her with mushroom cultivation, which raised her family status and increased her bank savings to ₹ 60,000.

₹ 60,000
Savings through Mushroom Cultivation

25 ft to 18 ft
Change in the water table*
*(*Level below the surface of the ground where water can be found) [CN4]*

Transforming Lives through Check Dam Construction

Chumbanala Watershed

Location :
Mandu Block, Ramgarh District, Jharkhand

Facilitating Agency/NGO :
Adarsh Kishan Club

> "In general, majority of the families residing in the project area have become self-dependent for food and the income level of the farmers has increased substantially by 2 times.

Agriculture was the only source of livelihood for people of Chumbanala Watershed of Ramgarh District, Jharkhand. Owing to lack of irrigation facilities, farmers relied on single crop cultivation during the Kharif season. Seasonal migration of adult male members was observed in the absence of assured source of income.

Under the watershed programme, 53.72 hectares of land was brought under field bunding, five new ponds were excavated, and two water harvesting structures were constructed to increase the water availability. Additionally, 20 loose boulder structures, 8 pucca check dams, 3 water tanks with water holding capacity of 3 lakh litres and 10 new check dams were created for water storage and community usage. Open grazing and tree felling were banned in the watershed area. Training on duckery, poultry, and fishery activities was given to the villagers.

Post the project implementation, 70% of the area has been saturated for irrigation. This has resulted in cultivation of three crops a year by farmers. Today, vegetables are being transported to Ramgarh town. The credit offtake among farmers has increased substantially since 2010. There has been an increase in enrolment of children in the schools situated in and around the watershed area. Besides, a steep rise in their income levels, farmers have started becoming self-dependent for their livelihoods.

70%
Area saturated for irrigation

25%
Increase in credit offtake

New Canal Brings Barren Lands to Life

Handipuhan Watershed

Location :

Handipuhan Village, Mayurbhanj District, Odisha

Facilitating Agency/NGO :

SAMBANDH

> "Construction of a new canal of 180 feet, provides water to villages; has assured paddy crop in Kharif season.

At the foothills of Similipal Biosphere and upper catchment of Bhandan River at Handipuhan, a watershed is situated in Odisha state. The total area of this watershed is 698.89 hectares, out of this, 285.96 hectares is net cropped area. The entire agricultural land is fully rainfed. There is a seasonal stream called, "*Kudminala*", which runs through the village and drains to Bhandan River. In 2007, Government Line department had constructed a diversion structure in *Kudminala* with the objective to irrigate the agricultural fallow land. But, there was no channel system for irrigation, so, it remained defunct for years. In due course of time, the excess water would wash out the wing wall and the apron of the structure.

With support from NABARD under the KfW Soil project and SAMBANDH, the villagers planned to repair the diversion structure. The community contributed ₹ 6,604 as voluntary labour and the project support was ₹ 42,490. With this, a new canal of 180 running feet, was built and 22.3 hectares of area belonging to 76 farmers has started receiving assured Kharif season irrigation. The construction of this structure proved to be a great boon to the farmers for their Kharif paddy crop. The farmers now use this water on rotational basis. This canal has converted 2.5 hectares of barren land into cropped area.

The village community is ever so grateful to SAMBANDH and NABARD for their timely support, guidance and intervention providing them valuable water for irrigating their land.

22.3 hectares
Area belonging to 76 farmers came under assured irrigation

Soil Conservation - Making a Difference to Agriculture

Battuvanipalli Watershed

Location :

Battuvanipalli Village, Prakasam District, Andhra Pradesh

Facilitating Agency/NGO :

Accion Fraterna Ecology Centre (AFEC)

> "With the construction of farm bunds, stone outlets, stone gully plugs and stone bunding, soil erosion is drastically reduced and top soil is conserved.

The watershed committee of Battuvanipalli Village in District Prakasam, Andhra Pradesh has been playing an important role in conservation of valuable soil and water resources under the watershed programme rolled out by NABARD.

Under Soil Conservation activity, New Farm Bunds, Stone Outlets, and Stone Gully Plugs were constructed by adopting ridge-to-valley approach on 122 acres of land. Out of the total 42 small and marginal farmers, 24 farmers belonged to scheduled caste and 12 were from backward communities.

Prior to the construction of conservation structures, only 25 to 42 acres of the area was under Groundnut cultivation based on the rainfall, rest was wasteland. The normal rainfall in the district is 544 mm, but for the past 10 years it got further reduced to 350 to 400 mm, and that too was rather sporadic and erratic. With so little rainfall, perhaps Groundnut was the only major crop that could be cultivated in Battuvanipalli village.

With the construction of farm bunds, stone outlets, stone gully plugs and stone bunding, soil erosion was drastically reduced and the top soil conserved. The NGO Accion Fraterna Ecology Centre (AFEC) motivated the farmers to adopt Sustainable Agricultural practices by avoiding chemical fertilisers and patronise bio-fertilisers to improve the fertility of the soil. After about four years, these efforts proved fruitful. This area turned more fertile with increased organic soil and decrease in top soil erosion.

During the year 2017, about 118 acres were brought under cultivation with crops like Castor, Sorghum, Cow pea, Redgram and similar varieties. Farmers revealed that the village landscape was transformed. The countryside now looked beautiful with crops and structures from ridge to valley. They also felt that the land had become fertile with the use of bio-fertilisers and reduction in top soil erosion. Farmers and the members of the watershed committee expressed their immense joy that due to the watershed activities, wasteland could be brought under cultivation. They thanked NABARD and AFEC for their huge support, which had changed their lives and provided them with adequate nutritious food and a decent living.

118 acres

Land brought under cultivation, as against 42 acres earlier

Building Climate Resilience through Watershed Treatments

Shelvihire Watershed

Location :

Shelvihire Village, Akole Block, Ahmednagar District, Maharashtra

Facilitating Agency/NGO :

Watershed Organisation Trust (WOTR)

> "Watershed interventions have resulted in increased water availability. Resultantly, the area under Rabi cultivation has increased.

Realising the growing challenges arising out of climate change to small-scale farmers, NABARD in collaboration with KfW, initiated a project for integration of watershed development strategies with Climate Change Adaptation (CCA) for rehabilitation of soil degradation in the Shelvihire Village of Akole Block, Ahmednagar District, Maharashtra. This was done to improve soil health and reduce exposure to climate change in watersheds through sustainable use of soil and water resources. The village is among the 16 villages covered under the said project.

While implementing different measures in the project, special attention was placed on social mobilisation through capacity-building. Through meetings conducted by Gram Sabha, Self-Help Groups (SHGs) of women and arranging an exposure visit for women to Mhaswandi Village, WOTR tried to inculcate a sense of ownership of the project through active participation of the community. The community members were encouraged to do shramdaan (voluntary work) for the benefit of the village.

7,500 cubic metres of farm bunds and 20 loose boulder structures were built to control soil erosion and reduce velocity of water. Emphasis was given on soil testing to ensure the application of optimum fertilisers according to the crop need. Farmer Field Schools (FFS) were conducted for wheat and gram cultivation in Rabi season. 150 farmers were taught to prepare organic formulations for disease control. Seed treatment, agriculture demonstration and promotion of kitchen garden activities were also implemented. Agricultural advisories were disseminated to farmers through Automated Weather Station (AWS) installed in the project villages to improve agricultural productivity. Additionally, water budgeting was introduced to calculate the water availability for deciding their optimal utilisation.

Watershed interventions have resulted in increased water availability. This, in turn, has increased the area under Rabi cultivation. Farmers have started growing Sorghum as a fodder for their cattle. Weather-based and crop-specific agronomic advisories, sent through SMS, have enhanced the crop yields. Overall, the project has proved to be successful in positively impacting the lives of farmers and enhancing their capabilities.

150
Farmers benefited from demonstration on composting

7,500 cum
Farm bunding

Channelising Irrigation for Prosperity

Baryali Fugwana Watershed

Location :
Thera, Himachal Pradesh

Facilitating Agency/NGO :
Ambuja Cement Foundation

> "After construction of the irrigation channel, I can now produce yield worth ₹ 2-2.5 lakh as compared to ₹ 1.5 lakh earlier, earning additional annual profit of around ₹ 50,000-₹ 1 lakh.

Baryali Fugwana Watershed in Himachal Pradesh is in Full Implementation Phase, being jointly implemented by NABARD and Ambuja Cement Foundation. This watershed covers a treatment area of 1,185 hectares in 21 villages having 884 households with a total population of 4,446. Full implementation phase started in March 2017 and will be completed in March 2021.

In Thera, one of the watershed villages, about 30-35 families reside, whose main occupation was rainfed agriculture. Farmers were mainly growing maize and wheat on rainfed agricultural land of 60 bigha (9.6 hectares). During a village meeting under the project, farmers were informed of the benefits of cash crop cultivation. Seeds and other inputs were provided through the FPO at Darlaghat to encourage cash crop cultivation. However, irrigation facility was absent as the old irrigation channel had been abandoned completely.

Area surveillance undertaken by the Project Engineer revealed that the channel could be repaired and converted into an RCC channel. Channel repair was approved, and a 350 RM channel was constructed, linking the channel with a check dam constructed by Ambuja Cement Foundation. Irrigation water fed the fields and an area of about 40 bigha was converted into irrigated land. Cropping intensity and off-season vegetable cultivation such as tomato, cucumber, beans increased, enhancing the farmers' income by 30-40%.

The happiness of the Thera villagers is evident from the words of native Ravi Kumar, "I have been planting about 15,000 tomato plants for last three years. Earlier, I used to face water shortage in the peak growing months of May-June, resulting in lower yields. After construction of this irrigation channel, I can now produce yield worth ₹ 2-2.5 lakh as compared to ₹ 1.5 lakh earlier, earning additional annual profit of around ₹ 50,000 - ₹ 1 lakh from the vegetable cultivation."

6.4 Ha (40 Bigha)
Converted into irrigated land out of total agricultural land of 9.6 Hectares (60 Bigha)

30-40%
Increase in farmers' income post watershed intervention

Protection of Livelihoods with Drainage Line Treatments

Maniyargad Watershed

Location :

Maniyargad Village, Tehri Garhwal District, Uttarakhand

Facilitating Agency/NGO :

Samarpit Seva Sansthan (SSS)

> "Cutting and slumping off has been checked through the construction of gabion structures along the drainage line. The lives of the community and individual landholders have been saved from the menace of erosion.

The stream bank erosion in the drainage network of Maniyargad watershed was quite noticeable. The widening and deepening of the network was causing havoc to the adjacent community. Beneficiaries of the project area villages viz. Kot, Pursol, Pali and Gajna reported damaging effects of gully expansion in their productive lands, which was their main source of livelihood. It was a matter of serious concern as the land once degraded cannot be restored.

To combat the situation, a team of experts explained that heavy water flowing in the gullies need to be channelised. The remedial measures being expensive, the participants came forward to willingly contribute to put control measures in place. With the cooperation of the community members through Shramdaan, 598.34 m^3 of gabion check dams across the gullies of the streams network were constructed under the project. Also, they placed large-sized stone crates networked with GI wire across the drainage lines of major streams such as Lalsi Naame Tok, Majiyar Cheda, Agodi Khal, and others.

The saying 'Seeing is believing' has worked wonders for the community. Cutting and slumping off has been checked through the construction of gabion structures along the drainage line. The lives of the community and individual landholders have been saved from the menace of erosion. Realising the importance of the expensive structures, the participants acknowledged that they would take all necessary steps to protect drainage line treatments from any damage, as these worked as an insurance cover to sustain their livelihoods.

598.34 m^3

Gabion check dams constructed through Shramdaan (Voluntary Labour)

Erosion Control through Contour Trenching

Maniyargad Watershed

Location :

Maniyargad Village, Tehri Garhwal District, Uttarakhand

Facilitating Agency/NGO :

Samarpit Seva Sansthan (SSS)

> "The benefits of contour trenching have been massive. Napier grass has arrested eroded soil and led to its deposition into the contour trenches.

The upper reaches of the Maniyargad Watershed are characterised by steep, rugged and undulating topography. Insufficient vegetative cover is unable to protect the land against severe erosion during heavy rainfall. Consequently, the eroded material moves to the middle and lower reaches, where it overlays terraced crop land.

The beneficiaries expressed their concern over the menace of soil erosion in the upper reaches and the damage caused to their crops grown on the downstream terraces. The problem was encountered by them in every monsoon season. To control the growing soil erosion, 3,236 cubic metres of contour trenches were excavated in the upper reaches. Besides, Napier slips and lemon saplings were planted on the margins of the trenches.

The benefits of contour trenching have been massive. Napier grass has arrested eroded material and led to its deposition into the contour trenches. Following its good growth, Napier (3.5-4.0 Kgs of biomass per trench) has also been useful as fodder for the livestock. At the bed of the trenches, lemon saplings have established themselves very well and are expected to yield a good produce in the years to come. Post the implementation of contour trenching technique, 258 tonnes of eroded material have been estimated to be arrested mid-way, which otherwise would have traversed to lower reaches and destroyed the crops.

3,236 cubic metres
Contour trenches excavated

258 tonnes
Eroded material arrested due to contour trenching

Opportunities for Harnessing of Natural Resources

Kerabar Watershed

Location :
Chainpur Block, Gumla District, Jharkhand

Facilitating Agency/NGO :
Gramin Vikas Trust

> "Post increased water availability, there has been a spurt in average days of farming from 56 to 110 in a year, as well as rise in daily wage of labourers.

Kerabar Watershed area of Gumla District, Jharkhand was beset with physical barriers such as steep slopes, waste lands, slide-prone soils, along with heavy rainfall, excessive run-off and torrential flows. This was aggravated by socio-economic problems, land tenure issues, poverty, illiteracy, labour shortage, and large scale migration.

With continuous interaction among the villagers and social re-engineering, PFA, Gramin Vikas Trust, motivated the watershed villages to adopt new approaches and methodology. The watershed project implemented across the villages focussed on soil and water conservation and enhancing agricultural productivity.

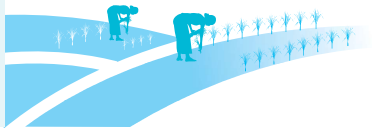
Major interventions of the programme were construction of 17,595 cum of farm bunds covering fields of over 400 farmers, loose boulder bunds, and earthen check dams to prevent water runoff and soil erosion. To increase the water availability in the villages, Water Absorption Trenches (WAT) were dug along the foothills and 15 farm ponds were constructed. Further, creation of water harvesting structures raised the surface water storage capacity to 95.598 thousand cubic metres (TCM).

Post increased water availability, there has been a spurt in average days of farming from 56 to 110 in a year, as well as rise in daily wage of labourers. Reduction in fallow land, increase in irrigated land and vegetation cover, and reduced dependence on forest, were among the other benefits of the watershed project.

Moreover, women of the watershed project village have gained a respectable position through the SHGs and are engaged in poultry farming, fisheries & leaf plate making for income generation. Project interventions have resulted in income enhancement of the farmers and socio-economic upliftment of the local community.

196
Farmers benefited with increased production & better livelihoods

₹ 15,000 – 25,000
Average additional income through various income generation activities



Watershed Management - Boon to Agriculture

Ganganapalli Watershed

Location :

Ganganapalli Village, Kadapa District, Andhra Pradesh

Facilitating Agency/NGO :

Community Development Society (CDS)

> "Watershed created huge benefit to farmers - cultivation of variety of crops made possible, even in summer.

Ganganapalli Village, Thondur Mandal is one of the drought-prone villages in YSR Kadapa District of Andhra Pradesh state. Located 75 kms away from the District Headquarters, the population comprises 277 families with 885 persons (Male - 443 and Female - 442). Geographically, Ganganapalli Watershed falls under the rain shadow area; with an average annual rainfall of 620 mm. The major challenge in this village is crop cultivation dependent on rainfall only and soil erosion resulting in low farm productivity. To tide over backwardness and unfavourable agro-climatic conditions, NABARD has implemented Ganganapalli Watershed Development Project through Community Development Society (CDS) as a Project Facilitating Agency (PFA). The total watershed area is 861 hectares, out of which 791 hectares has been identified for augmenting land and water resources.

Continuous Contour Trenches (CCT), Water Absorption Trenches (WAT), afforestation, check dams, percolation tanks, farm ponds, dug out ponds, horticulture, farm bunding with revetment and gully control work was implemented through ridge-to-valley approach. This well-planned implementation strategy coupled with full cooperation and participation of the farmers under the supervision of Village Watershed Development Committee (VWDC), Ganganapalli Watershed achieved phenomenal results in technical and social components, where CDS played the role of a facilitator.

Under the project, the existing pond, which had got silted, was de-silted, and was full of water during the rainy season, due to which borewells started yielding water. As a result of various treatment initiatives, about 200 acres of uncultivated land was transformed into cultivable land.

Farmers were benefited in a big way. They soon began cultivating vegetables like Onion, Cotton, Red Gram, Green Gram, Jowar and Sunflower and obtained encouraging yields. In 2017, KfW Soil project was implemented in the same village to minimise the risks of climate change and to increase the income of communities living in the watershed. 100 farmers were benefited from Summer Ploughing and 158 farmers from Deep Ploughing and silt application. 116 farmers switched over to alternate crops like Onion and adopted kitchen gardens. 6 Farm Ponds were renovated.

200 acres
of uncultivated land was transformed to cultivable

6
Ponds renovated

Farm Bunding for Bountiful Harvests

Gala Shivpur Watershed

Location :

Gala Shivpur Village, Pathalgaon Block, District Jashpur, Chhattisgarh

Facilitating Agency/NGO :

Raigarh Sahyog Samiti (RSS)

> Farm bunding under watershed development project helped in improving yield of wheat crop.

Bhog Singh, a resident of Village Gala Shivpur, Block Pathalgaon, in Jashpur District of Chhattisgarh state was a poor marginal farmer. Two years ago, when NABARD's watershed project was rolled out in this area, he did not have sufficient knowledge of improved techniques to boost agricultural production. He has a family of five members and all of them were dependent on farm income, which was meagre.

Bhog felt confident when NABARD initiated the Watershed project in his village, Gala Shivpur. In 2015-16, under this project, farm bunding was done on his field. Since then, Bhog Singh has been planting wheat crop in 3 acres of his farm as a Rabi crop. Experts from Raigarh Sahyog Samiti (RSS) provided professional guidance from time to time to enable him to get a good yield of wheat crop. Thus, in just three months, about 45-46 quintals of wheat crop was produced. Bhog Singh earned a hefty income of ₹ 92,000.

He has also built a house under the Prime Minister's Housing scheme. Today, Bhog Singh is extremely happy and financially secure with a roof over his head too. He is thankful to NABARD for initiating the Watershed Project in his village and giving him plenty of support and to Raigarh Sahyog Samiti for their expert guidance, which has given him a superior life.

45-46 quintals
Wheat produced on 3 acres

₹ 92,000
Income in 3 months

Enhanced Irrigation, Sustainable Livelihood

Karanghati Watershed

Location :

Karanghati Village, Pakur District, Jharkhand

Facilitating Agency/NGO :

Rural Tribal Environmental Research and Conservation Team (REACT)

> Before intervention of the project, the average annual income per household was ₹ 40,662 only, whereas in 2018, the average annual income rose to ₹ 76,352.

Located in Pakur District of Jharkhand, Karanghati Watershed faced the problem of soil erosion, water scarcity and over exploitation of ground water. Lands in the micro watershed were unable to conserve the natural resources. Besides, lack of knowledge and poor awareness among the community members on government schemes & programmes, and inadequate access to alternate sources of fuel wood, resulted in poor vegetation cover in the area. High level of deforestation was observed towards the north of watershed.

The watershed area was in dire need of in-situ soil and moisture conservation measures, along with construction of farm ponds, dug out ponds, and bunds. Following the watershed programme, water availability and consequentially cropped area in the project area increased. Afforestation and perennial fodders increased the green cover in the forest fringe areas and wastelands. Among other significant benefits were 130% increase in irrigated area, 166% increase in moisture index, 22.9% reduction in wastelands, and others.

Soil and water conservation measures have enhanced farm and non-farm income of households. Farmers have been cultivating pasture and green fodder for their livestock. Besides, the cropping pattern has changed from paddy and maize to red gram, wheat, Bengal gram, green gram, lentil, and others. The project interventions have facilitated the growth in income of farmers, and agricultural labourers. Average annual income per household increased from ₹ 40,662 to ₹ 76,352. Self-employment of small landholders increased the livelihood and income opportunities of 106 households.

87.7%
Increase in average annual income

130%
Increase in irrigated area











Sustainable Farming Practices

Sericulture - Solution to Sustainable Enhanced Income

Thummachenupalli Watershed

Location :

Chinnagottigallu Mandal, Chittoor District, Andhra Pradesh

Facilitating Agency/NGO :

Rashtriya Seva Samithi (RASS)

> "According to M. Narayana Reddy, Sericulture is more remunerative than agriculture and horticulture; as mulberry plantations can survive even under severe drought conditions and earn higher returns than any other crop.

Tomato is the major crop in Thummachenupalli Watershed located in Chinnagottigallu Mandal of Chittoor District of Andhra Pradesh. Tomato farmers were getting more yield and better prices due to availability of water and improved method of cultivation. Staking of tomato plants had led to increase in plant population per unit area.

However, the demand-supply gap in the market resulted in falling of prices to an all-time low and in most of the cases, the cost of harvesting and transportation could not be realised. The use of fertilisers and chemicals was also very high in cultivation of tomatoes, which also led to deterioration in soil conditions. At this juncture, the PFA Rashtriya Seva Samithi (RASS) suggested sericulture to the farmers and sensitised them for diversification/change of cropping pattern.

As an incentive, RASS, under the KfW Soil Project, provided mulberry seedlings for plantation on 6 hectares under this watershed area. Concerned farmers also got subsidy from Dept. of Sericulture, Government of Andhra Pradesh for construction of shed and for purchase of inputs with the facilitation of RASS. The agency organised training programmes under KfW Soil project (NABARD) at RASS office, Chinnagottigallu mandal, where KVK Scientist, Ms. Padmaja spoke on Sericulture and explained the process of mulberry cultivation and Silkworm rearing to the new farmers with video films. She also interacted with farmers, regularly visiting the farms and suggested improvement in the sheds.

M. Narayana Reddy, a 42-year-old farmer, residing in this Watershed area, with a family of three members was actively engaged in agriculture. Earlier, he was growing paddy in 0.5 hectare, tomato in one hectare and practising Floriculture in 0.25 hectare. In 2017, his gross annual income from 1.75 hectares of land was ₹ 2.5 lakh with cost of cultivation of ₹ 1.9 lakh, leaving him a profit margin of just ₹ 60,000. In 2018, he established a sericulture unit. The size of the rearing shed was 50'x22'x15' and mulberry cultivation was taken up in one hectare of land with drought-tolerant variety V-1. Under KfW Soil project, 1,000 mulberry seedlings per 0.25 acre were supplied to the farmer and the remaining seedlings were bought with his own contribution. RASS helped the farmer and his wife M. Chengamma in developing linkage with Department of Sericulture, Govt. of Andhra Pradesh and assisted them to obtain a subsidy of ₹ 2.5 lakh too. Timely guidance by RASS, KVK Scientist (Sericulture) led to the success of this venture.

According to M. Narayana Reddy, Sericulture is more remunerative than agriculture and horticulture; as mulberry plantations can survive even under severe drought conditions and earn higher returns than any other crop. He is more satisfied with Sericulture than Tomato farming too, as output from Sericulture has better shelf-life, is stable and more lucrative. It can survive even in difficult climatic conditions.

In 2018, M. Narayana Reddy's net earnings were around ₹ 94,200. Observing his success, three other farmers in the vicinity were encouraged to take up sericulture. With increased voluntary participation and enthusiasm from the farmers, RASS is facilitating and replicating sericulture across several farms with technical support services from the KVK.

₹ 94,200

Net earnings in a year up from ₹ 60,000 earlier

System of Crop Intensification - Growing More With Less Seeds

Veernamala Watershed

Location :

Podichenu Village, Veernamala Watershed, Chittoor District, Andhra Pradesh

Facilitating Agency/NGO :

Mitra Association of Social Sciences (MASS)

> "Adoption of System of Rice Intensification (SRI) technique for Ragi cultivation led to two successful crops of Ragi per year.

P. Sankar, a poor farmer of Podichenu Village, Veernamala Watershed area of Ramakuppam Mandal, Chittoor District, owned a plot of land, about 1.50 acres. He cultivated Ragi once a year in traditional way before the implementation of the KfW Soil project. Although he and his family worked as farm labourers, their combined incomes were not sufficient to fulfil the family needs. Recurring droughts increased his problems, which not only decreased his yields but also burdened his alternate employment opportunities. In 2017, the NGO Mitra Association of Social Sciences (MASS) started KfW Soil project work in the village. When the System of Rice Intensification (SRI) technique and its principles were introduced in Ragi cultivation, in the project, Sankar felt interested to practise it under the guidance of the project staff. The new method of Ragi cultivation brought a sea-change in his life.

Before the implementation of this project, Sankar used to get 3.5 to 4 quintals of Ragi per acre with water from a farm pond and borewell. The orientation meeting and exposure visit on SRI cultivation by organic method at Madanapalli Watershed implemented by Andhra Pradesh Mahila Abhivruddhi Society (APMAS) benefited him and several others. He learnt new agricultural techniques. Now he is able to take two crops per annum in the same field by using SRI method, thus obtaining 7 quintals per acre during both the Kharif and Rabi seasons. In 2018, he obtained 10 quintals yield with an income of ₹ 25,000 by selling the Ragi at ₹ 25 per kg. He and his family members also supplemented their income through labour work, which enabled them to save enough money to buy one calf. Today, he can educate his children; his son is studying in class 7 and daughter in class 5 in the Government High school in Veernama. Sankar's life has dramatically changed. He is more confident today with an identity of his own and has plans to buy more land for growing crops and send his children for higher education.

₹ 25,000

Earnings from 10 quintals of Ragi produced on 1.5 acre of land in one season

Fighting Drought with RainGun

Billekal Watershed

Location :

Billekal Village, Kurnool District, Andhra Pradesh

Facilitating Agency/NGO :

Sri Parameswari Educational Society (SPES)

> "If NABARD had not stepped in and arranged for rainguns, pipes and oil engines on rental basis along with labour charges of ₹ 32,400, the entire crop would have failed.

In some regions of India, to boost agricultural production, a variety of initiatives are taken. Under the KfW Soil project, the Raingun initiative implemented in Billekal Village, Kurnool District, Andhra Pradesh was a significant one. As part of this project, NABARD provided three units of rainguns, to the farmers for implementing protective irrigation, whenever they faced drought conditions.

Under the project, a lady farmer G. Hanumanthamma, wife of G. Peddi Reddy, took up cultivation of groundnut and red gram crops. During the Kharif (2018-19) season, unfortunately due to inadequate rainfall and long dry spells, the crops in her field faced drought conditions.

A Dug Out Pond (DOP) of 15 X 15 sq. ft. size was constructed in her field during 2013-14 under the NABARD supported Watershed Development Project. The DOP was filled with the rainwater during the monsoon season. During August 2018, when the crop faced water stress, KfW Soil Project arranged raingun in her field on a rent of ₹ 1,200 to protect the crops from being withered away. Soon a demo was held in the presence of Shri Parthava, DDM, NABARD. Subsequently, Hanumanthamma practised raingun technique in her field and saved the crop from drought conditions. She was overjoyed and thanked KfW, VWDC, NABARD officials and NGO Sri Parameswari Educational Society (SPES) staff for providing her rainguns on rental basis to save her Kharif crops. Farmers in the vicinity of her field saw the use of rainguns and its advantages, and they too felt confident to take up this new irrigation technique.

If NABARD had not stepped in and arranged for supply of rainguns, pipes and oil engines on rental basis along with an expenditure of ₹ 33,060 incurred on crop cultivation, the entire crop would have failed due to drought conditions. With the adoption of raingun technology, there was net income of ₹ 39,740 from groundnut and red gram against last year's net income of ₹ 18,000 per acre.

Thus, through new techniques of farming, such as, raingun sprinklers, NABARD helped to improvise the irrigation systems in Billekal village, thus giving new hope and joy to the farmers, whose lives are completely dependent on agriculture.

Benefits of Raingun:

- Saving the crop during drought condition
- Promotes irrigation with less water
- Saving of valuable water almost 30 percent
- Covering larger areas of the field at a time
- Uniform distribution of water in the fields
- Portable system of water supply
- Electrical conductivity of soil remains almost the same
- Reduces the problem of water-logging and salinity in the fields
- Increased crop yield
- Reduces chances of pest and insect attacks

₹ 1,200
Small expenditure on rental of raingun

₹ 21,740
Increase in Net Income from Crop

Crop Diversification - Stable and Resilient Farming

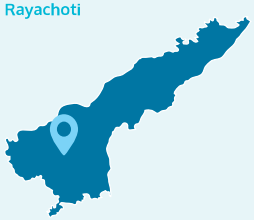
Adavikampalli Watershed

Location :

Adavikampalli Watershed Project, Kadapa District, Andhra Pradesh

Facilitating Agency/NGO :

Rayalseema Harijana Girijana Backward and Minorities Seva Sanstha (RHGBMSS), Rayachoti



> "Farmers noticed that while climate and soil conditions were limiting farming activities previously, crop diversification provided year-round employment to them.

Most of the farmers in the villages in and around the Adavikampalli Watershed Project, Kadapa District, Andhra Pradesh, were supported by NABARD under KfW Soil Project to cultivate crops like Groundnut, Redgram, Jonna, Castor and similar crops.

Looking at the peculiar problems of cultivation in this district, NGO Rayalseema Harijana Girijana Backward and Minorities Seva Sanstha (RHGBMSS), Rayachoti, which is the Project Facilitating Agency, recommended crop diversification with Watermelon. They felt that a strategic shift from food crops to vegetables would benefit the villagers.

An enterprising farmer, Sahadeva Reddy cultivated Watermelon crop with an expenditure of ₹ 36,000 per acre and earned an income of ₹ 1,23,000; with net profit of ₹ 87,000 per acre. Sahadeva and other farmers observed that, as diversity of crops increased, the risks of pest and disease infestation in their farms reduced and they were able to achieve good crop yields.

Farmers noticed that while climate and soil conditions were limiting farming activities previously, crop diversification provided year-round employment to them. Further, they realised that crop diversification can break pest and disease cycles, and weed infestations, thereby reducing the risk of crop failure. Sahadeva also added that water retention capacity and fertility of the soil had remarkably increased over the course of time.

Crop Diversification has multiple economic and social benefits:

1. Diversified cropping tend to be more stable and resilient
2. Reduced risk of crop failures, leading to assured incomes
3. Less incidences of diseases and pests
4. Employment over a longer period of time
5. Increased farm productivity and year-round incomes
6. Provides a better standard of living for farmers and their families

₹ 87,000
Net Profit per acre

Multiple Cropping, Multiple Benefits

D. Kotakonda Watershed

Location :
Kurnool District, Andhra Pradesh

Facilitating Agency/NGO :
Sri Parameswari Educational Society

> Sustained income for farmers through Multiple-cropping systems.

A few farmers in the KfW Soil project in D. Kotakonda Watershed, Kurnool District of Andhra Pradesh showed interest in learning new and ground-breaking methods of farming. The KfW Soil Project conducted awareness programmes on inter and multiple cropping patterns in this region with the support of resource persons and provided good quality seeds and fruit saplings to the farming community.

Under the project, U. Yerri Swami, one of the farmers was provided seeds of high yielding variety (K6) of Groundnut, vegetable mini kits (seeds of tomato, cucumber, ridge gourd, green peas/batani, etc.), Gypsum and Neem cake. After meetings with the Horticulture Department of Government of Andhra Pradesh, saplings of high yielding Custard Apple (Sitafal) and floriculture were taken up for multi cropping pattern in his farm of two acres.

By cultivating these crops, during the last season, he earned ₹ 40,000 from floriculture, ₹ 55,000 from Vegetable cultivation & ₹ 58,000 from Groundnut & Redgram apart from a good output of Sitafal. Thus, with multi-cropping, he was able to receive higher yields and better income. To manage water efficiently, he installed drip irrigation on his borewell, which resulted in significant savings of water as well.

Multiple cropping systems are a boon, not just for the soil, but also to the farmer and the nation:

- Better utilisation of land
- Improved yields per unit of land
- Different types of farm produce grown simultaneously
- Costs on inputs decrease per unit area
- A balance diet for the family
- Helps to maintain soil fertility
- Controls weeds and pests

₹ 1,53,000

Earnings from just two acres of land in a season

Plasticulture brings Agricultural Prosperity

Manchali Watershed

Location :

Savakanahalli Palya Village, Gundlupete Block, Chamarajanagar District, Karnataka

Facilitating Agency/NGO :

Tribal and Rural Development Organization (TARDO)

> "Somanna was overjoyed as he could now harvest 15 tonnes of watermelon. He earned a total income of about ₹ 1,00,000 with net profit of ₹ 70,000.

Somanna, a farmer from the village of Savakanahalli Palya, Gundlupete Block, Chamarajanagar District of Karnataka state had completed primary education and his main occupation was agriculture. He had been cultivating tomatoes and beans for the past few years on his land of one acre. The gross income from these crops was about ₹ 22,000. Due to low market prices and higher input costs, he found tomato cultivation was not profitable. Hence, he discontinued tomato farming.

During the implementation of KfW Soil project, the farmer was advised to cultivate watermelon with drip irrigation systems in convergence with Horticulture Department. Under this project, mulching sheets were given with hybrid watermelon seedlings to suppress weeds and conserve water for crop raising. Mulching is a process of covering the soil surface around the plants to create congenial conditions for the growth of the crop. Liquid nitrogenous fertiliser and Calcium Nitrate were also applied with the fertigation unit of drip irrigation system for the optimal healthy growth of the plants. Pheromone traps and yellow sticky traps, cheaper than pesticide spray, were used to manage pest population in these farms.

Somanna was overjoyed as he could now harvest 15 tonnes of watermelon from one acre. He earned a total income of about ₹ 1,00,000 with net profit of ₹ 70,000. He made a large donation to the village Watermelon festival to encourage other farmers to grow this vegetable, which was cost-effective and profitable.

₹ 1,00,000

Gross income from one acre against pre-project level of ₹ 22,000

Tank Silt Application for Soil Health Security

Billekallu Watershed

Location :

Billekallu Watershed Project in Kurnool District, Andhra Pradesh

Facilitating Agency/NGO :

Sri Parameswari Educational Society (SPES)

> "Application of Tank silt improved fertility of the soil resulting in rich cotton and redgram yields.

G. C. Venkat Reddy of Billekallu Watershed Project in Kurnool District of Andhra Pradesh state was advised to apply tank silt of 10 to 12 tractor loads to the soil in his farm for improving soil fertility and productivity. This is mainly applied to improve moisture conservation and water holding capacity of the soil, as well as to enhance the nutrient status of the soil to yield a good growth of crop. Venkat Reddy was provided with ₹ 4,200 per acre from the project funds in 2017 in the Kharif season.

As guided, Venkat Reddy, applied tank silt in his farm. He sowed Bt Cotton crop with Redgram as an intercrop. Seed treatment was undertaken to control the rotting of seeds with bio control agent Trichoderma viridie @ 4 gm/kg of seed. He used Neem cakes in the last round of ploughing to reduce the damage through termites.

Unpredictable weather conditions, especially insufficient rainfall and its uneven distribution during the crop period had its own impact on agriculture. However, due to the application of tank silt, the moisture status of the soil improved and protected his crops during the dry spell.

It was observed that Tank silt also improved the physical structure and fertility of the soil. The farmer received a good harvest of 10 Quintals of Bt Cotton lint and 2 quintals of Redgram per acre after the harvesting period is over.

Venkat Reddy earned about ₹ 40,000 from the sale of Bt Cotton at the rate of ₹ 4,000 per quintal; ₹ 10,000 from sale of Redgram @ ₹ 5,000 per quintal; and ₹ 2,000 from Cow Pea (Pesulu). After deducting expenditure of ₹ 23,000 incurred on cultivating these crops, his net profit was about ₹ 29,000.

₹ 29,000

Net Profit from one harvest in one acre land

Bringing Happiness with Organic Farming

Kadavakurichi Watershed

Location :

Mutharaiyarnagar Village, Dindigul District, Tamil Nadu

Facilitating Agency/NGO :

Centre for Improved Health and Environment Protection (CIRHEP)

> "With the extra income, Ms. Arokyammal has bought 5 goats, 20 local poultry birds and a cow. She has started sending her children to better schools and is happy to provide them with standard education.

Mutharaiyarnagar Village in Kadavakurichi Watershed, situated at Nilakottai Taluk of Dindigul District of Tamil Nadu state faced severe drought and irregular monsoon. This adversely affected the crop production and yields of farmers. Depleted ground water resources and decrease in net sown area further added to the distress of the communities.

Ms. M. Arokyammal lives in the village with her husband, son and daughter. She owns about 3 acres of cultivable land having a well and a borewell. The area of her land under cultivation was limited due to recurrent droughts.

Inspired by the watershed initiatives using the concept of 'catch the rain where it falls', she joined the watershed development programme. As part of the project, Arokyammal was imparted training on soil and water conservation practices and making the switch to organic farming. With the Sustainable Development Programme (SDP) support, she initiated summer ploughing in her land for improved cultivation.

Earlier, Arokyammal used to cultivate flowers through chemical farming, as a result of which she suffered from breathing and skin problems and earned a minimal income. Post SDP training programmes, she started practising organic farming and learnt the procedure of preparation of organic inputs for better cultivation.

Summer ploughing has proved to be useful in harvesting the rainwater, as well as crop management in rainfed areas. Now, Arokyammal provides life-saving irrigation to the standing crops during the critical stages. Moreover, the practice of organic farming has been fetching Arokyammal a good income, higher than ever before. She earned a monthly profit of ₹ 33,000 from sale of Jasmine, Kakatan and Pichi flowers. With this additional income, Arokyammal has bought 5 goats, 20 country chickens and a cow. She has started sending her children to better schools to provide them with standard education.

₹ 33,000
Monthly profit from floriculture

Green Fields, with Wonder Fern

Jhabla Watershed

Location :
Girwa, Chhota Udaipur District, Gujarat

Facilitating Agency/NGO :
Seva Mandir

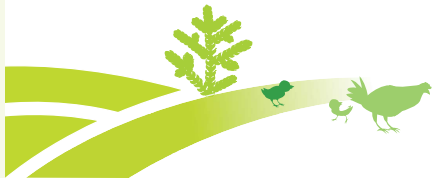
> Hoorji obtained a rich crop of 14 kgs of Azolla, which he could feed to his cattle and poultry. Balance quantity was also sold in nearby villages.

Azolla was popular among the farming community as a rice bio-fertiliser more than a thousand years ago. It is very useful in reducing greenhouse gases too. Sometime in June 2018, NABARD team and PFA-Seva Mandir introduced this wonder fern to the farmers at Jhabla Watershed in Girwa Block of Chhota Udaipur District in Gujarat.

Initially, the farmers were trained onsite and Azolla was first planted in the field of one of the farmers viz. Hoorji. With necessary guidance from the PFA-Seva Mandir and NABARD-PMU, Hoorji's family could successfully nurture the Azolla plantation and within a short span of just 20 days, his fields were blossoming with Azolla.

During his training, Hoorji had learnt that Azolla could be fed to cattle and poultry. Hence, he started feeding his cow, buffalo and poultry birds. The success of Hoorji was replicated by five more enterprising farmers. A rich crop of 14 kgs of Azolla was sold to the other village watershed projects, leading to the transformation of more green fields.

Appropriate guidance, persistent and close follow-up from PFA-Seva Mandir and NABARD-PMU transformed these fields into rich grasslands. Hoorji was extremely happy and proudly expressed his joy: **"Azolla khilane se meri gay va bhains ke hare chare ki jarurat poori ho rahi hai" (Azolla feed is providing the required green fodder for my cow and buffalo).**



14 Kgs
Azolla was produced in just 20 days

Ploughing Deep for Higher Yields Through Healthier Soils

Somarajukunta Watershed

Location :
Somarajukunta, Anantapuram District, Andhra Pradesh

Facilitating Agency/NGO :
Foundation for Ecological Security

> "Farmers have now undertaken deep ploughing in their remaining cultivable lands at their own expense. Other farmers in the vicinity are also following suit.

S. Nagarjuna Naidu, a 35-year-old farmer belongs to Somarajukunta, Dhaniyani Cheruvu Gram Panchayat in NP Kuntamandal, Anantapuram District, Andhra Pradesh.

From a very young age of 20, he has been involved in farming. He has 4 acres of land, out of which 2.5 acres is rainfed and 1.5 acre is under borewell irrigation. In the given climatic conditions, Groundnut was the only crop, whichcould be grown. The highest yield achieved during the past 8 years was only 11 bags of 44 kg each.

Out of 2.5 acres of his rainfed land, Nagarjuna, with handholding support from the NGO Foundation for Ecological Security (FES), was benefited with deep ploughing activity. As the soil in this district was very hard, deep ploughing was possible only in 0.80 acre at a given time to test its benefits. He had taken up Groundnut crop in two patches of 0.4 acre each; one crop was in 0.4 acre deep ploughed area and another in 0.4 acre normally prepared land.

By investing ₹ 8,100 for Groundnut cultivation in 0.40 acre of conventionally prepared plot, Naidu obtained 2.2 quintals of main crop viz. Groundnut, and 1.25 Bullock cart load of crop residue worth ₹ 6,250. On the other hand, he produced 4.4 quintals of main crop. Groundnut and 2 bullock cart load of crop residue worth ₹ 10,000 from the same area of land where 'deep ploughing' technique was used. It was therefore worth taking up this activity.

Farmers witnessed very encouraging results of deep ploughing not only in terms of increased crop growth and yield but also in terms of other production parameters like number of pods per plant, growth and weight of pod and size of the seeds in the pod. Also, there was considerable reduction in weed infestation in the crop, with small increase in the cost of cultivation on deep ploughing as compared to conventional ploughing.

Deep ploughing activity had brought about a remarkable change in the mindset of the farming community. Farmers quickly realised that though the initial land preparation is a little costlier than the conventionally prepared land for crop production, the resultant final benefits are far superior in terms of crop productivity and soil health. Farmers have now covered their remaining cultivable lands with deep ploughing at their own expense. Other farmers in the vicinity are also following suit.

4.4 quintals
Yield of Groundnut + 2 bullock cart loads of crop residue worth ₹ 10,000 obtained from 0.4 acre

Restoring Livelihoods through Crop Diversification

Chaidiya Watershed

Location :

Vislanga Village, Limkheda Block, Dahod District, Gujarat

Facilitating Agency/NGO :

N. M. Sadguru Foundation

> "Vegetable cultivation made it possible to provide nutritious food for family members, especially for the children and women.

An industrious and innovative farmer, Parmar Bhurjbhai Varsinghbhai of Vislanga Village of Limkheda Block, Dahod District of Gujarat state has a large family of 10 members. In spite of having 50 Bigha (25 acres) of land, he was forced to migrate to other parts of Gujarat in search of labour work to support his family. This was due to the fact that there was acute scarcity of water for irrigating crops in his field. He had to cultivate crops only in the rainy season and somehow, he barely managed to feed his family.

After successful implementation of Chaidiya Watershed project in his village, Parmar Bhurjibhai decided to pursue farming. Under the guidance of the project implementing agency, N.M. Sadguru Foundation, he undertook a host of activities and cultivated different types of crops. Now, he could grow crops throughout the year: in Kharif season, he cultivated Maize, Pigeon pea and Paddy and in Rabi season, he grew Wheat and Gram. In between, he also cultivated vegetables like Bitter-gourd, Brinjal, Tomato, Spinach, Coriander, Fenugreek, Bottle-gourd, Okra and similar vegetables. He was enthusiastic and took a step further by planting a hundred Teak trees on his field, which ensured a secured income for him. Vegetable cultivation made it possible to provide nutritious food for his family members, especially for the children and women. He could now confidently support his family and himself.

100
Teak trees planted

Boosting Income by Adopting Drip Irrigation

Ratanpur Watershed

Location :
Changod Village, Khedbramha Block, Sabarkantha District, Gujarat

Facilitating Agency/NGO :
Vikram Sarabhai Centre for Development Interaction (VIKSAT)

> Drip irrigation system boosted Babubhai's earnings by a spectacular 10-fold.

Farmers in Sabarkantha District of Gujarat state were facing challenges relating to agricultural production. NABARD was quick to initiate and support the watershed development programme, implemented by VIKSAT under IGWDP-KfW in this region.

Babubhai, a marginal farmer from Changod Village of Khedbramha Block took keen interest in improving his fields. Under the development activities, he installed the drip irrigation system in one hectare of land through the MISSAL programme supported by John Deere Foundation. The involvement in MISSAL programme and adoption of drip irrigation system equipped him with the opportunity to change his cropping pattern and cultivate crops even in the Rabi season in 2015. Babubhai received yields of 19.87 quintal, 10 quintal and 5.10 quintal from crops like tomato, onions and wheat, respectively. Within seven months, he earned an income of ₹ 45,381 through sale of his produce. The drip irrigation system boosted his earnings by a spectacular 10-fold.

In 2016, during summer, he cultivated Cluster beans and Lady's Finger in 0.07 hectare of land with a yield of 626 kg. Within three months, he earned an income of ₹ 18,780 by selling his produce in the village market. Cumulatively, Babubhai earned ₹ 64,161 in the cropping year 2015-16 from field crops and vegetables, through his keen desire to learn new ways to promote agriculture.

Before the programme, Babubhai was growing cereals, cotton and pulses in his field during Kharif and Rabi seasons. If the rainfall was good, he was able to cultivate in summer. In Rabi 2014, Babubhai cultivated wheat in 0.23 hectare, which fetched him a net income of ₹ 4,237.

₹ 64,161
Earned in cropping year 2015-16

Water flows, Income grows

Maa Andhari Watershed

Location :

Naik Karla, Jharsuguda District, Odisha

Facilitating Agency/NGO :

Social Education for Women's Awareness (SEWA)

> "I extend my heartfelt gratitude to SEWA and Maa Andhari Watershed Project supported by NABARD. It is because of them that I am earning sufficient income for my family and myself.

Naik Karla Village under Jammal Panchayat of Jharsuguda District of Odisha state had insufficient water resources and was heavily dependent on rainfall. Village farmers were involved largely in paddy crop cultivation.

Kumarmani Rohidas, a village resident, living with his wife and two sons, owned about 5 acres of cultivable land scattered around the village. He traditionally cultivated paddy crop to support his family. As part of the Maa Andhari Micro Watershed Project supported by NABARD, Rohidas was supported with construction of dug-well of dimensions 20x30 feet. Adequate water in the well ensured year-round irrigation on his five acres of land. Furthermore, the land was equipped with drip irrigation system to save water.

With improved water availability & efficiency and as encouraged by the NGO Social Education for Women's Awareness (SEWA), Rohidas turned to cultivation of cash crops such as lady's finger, chilly, brinjal along with a Mango orchard. These profitable ventures have made him a model farmer in the village and other farmers have started taking technical advice from him.

Today, Rohidas's annual income ranges from ₹1.50 lakh to 2 lakh, a substantial improvement from the earlier years. The satisfaction from his remuneration is amply visible when he says, "I extend my heartfelt gratitude to SEWA and Maa Andhari Watershed Project supported by NABARD. It is because of them that I am earning sufficient income for my family and myself."

₹1.5-2 lakh per year
Earnings from crops after construction of the dug-well

Increasing Net Returns through Intercropping

Ponnakal Watershed

Location :

Ponnakal Village, Kurnool District, Andhra Pradesh

Facilitating Agency/NGO :

The Andhra Pradesh Academy of Rural Development (APARD)

> "These learnings and technical training enlightened B. Ramudu to acquire better skills in cultivation and identifying quality of good seeds. In addition, he understood the importance and benefits of inter cropping.

The Andhra Pradesh Academy of Rural Development (APARD), Kurnool, the facilitating agency for KfW Soil Project and Ponnakal Watershed Project in Kurnool District of Andhra Pradesh, encouraged farmers, who were growing cotton, to increase its productivity and net returns through several measures like inter cropping and IPM measures taken up during the Kharif season 2017.

B. Ramudu from Ponnakal Village owns 2.4 acres of land and has a family of four members. Due to vagaries of the monsoon, which is unpredictable, his cotton crop had failed previously and fetched him a yield of only 5 quintals per acre. It was observed that Ramudu was practising mono-cropping especially for cotton and he had no access to good quality seeds. APARD helped him in concluding that cotton seed production is critical among the farmers in this region. APARD distributed good quality breeder Cotton seeds and Red gram to farmers for seed production. They advised farmers not to practise mono-cropping and encouraged them to sow cotton seeds with Red gram as inter crop for better returns.

In the improved scenario, the farmer fetched 12 quintals of cotton per acre and total 4 quintals of Redgram from the inter crop. After harvest, the improved seed was stored in the FPO Seed Bank in the KfW Soil project village for wider distribution. Before these interventions, the farmers were dependent only on dealers and middlemen for obtaining seeds with no guarantee about its quality.

These learnings and technical training enlightened B. Ramudu to acquire better skills in cultivation and identifying quality of good seeds. In addition, he understood the importance and benefits of inter cropping. His earnings improved with an income of ₹ 96,000 from Cotton and ₹ 22,000 from Red gram cultivated on 2.4 acres of land, yielding 28 quintals of Cotton and 4 quintals of Red gram.

₹ 1,18,000
Earnings in one season from just 2.4 acres of land

Determination is the Power to a Better Life

Biratpat Watershed

Location :

Patsanipur Village, Patsanipur Block, Udala, District Mayurbhanj, Odisha

Facilitating Agency/NGO :

Social Organization on Various Aspects (SOOVA)

> "Narendra Singh's hard work, zeal and perseverance helped him not only to increase his family income and make his family self-sufficient but also created his own individual identity.

Narendra Singh is an underprivileged farmer residing in Patsanipur Village, Patsanipur, Block Udala, District Mayurbhanj, Odisha. He has a family of 7 members. Their main and single source of income has been cultivating paddy.

Before the intervention of the NABARD project, he was practising traditional farming on one acre of land. Due to lack of awareness and knowledge, he was cultivating paddy just once a year. But after the intervention of NABARD and KfW Soil project in cooperation with Social Organization on Various Aspects (SOOVA), in 2017, he got involved in both line-sowing of paddy in Kharif season and Climate Resilient Vegetable Cultivation in Rabi season.

Once, SOOVA's team interacted with his family members and provided them required technical and monetary support, Narendra Singh started practising it in a very organised way and in that year, he made phenomenal profit. Since then, his family practised agriculture as a primary source of income. Through agriculture, his family earnings increased by ₹ 25,000 per year. His three children are now studying, one in Anganwadi, and two are in school in Standard 2 and 4.

Before this project, he was an ordinary farmer; but right now, he ranks as an advanced and progressive farmer. He has become a member of the Kotharaja Producer Company. He attended various training programmes and meetings on agriculture and Agri-allied activities conducted by SOOVA under the NABARD-KfW Soil project, Government Departments and other agencies so as to gain more knowledge to increase crop productivity. His enhanced income enabled his younger brother Gourahari Singh to purse B.Ed. The success of Narendra Singh prompted two more farmers, namely Basudev Singh and Mochiram Singh, of the same village, to undertake Climate Resilient Vegetable cultivation during Rabi season.

Narendra Singh's hard work, zeal and perseverance helped him not only to increase his family income, and make his family self-sufficient but also created his own individual identity. In the recent season, his total income from cultivation of vegetables alone is about ₹ 13,000.

₹ 25,000 per year
Increase in Earnings making the family self-sufficient.

Green Manuring & FYM Application to Reap Rich Yields

Kolimitta Bidiki Watershed

Location :

Matamma H/W Village, Madithadu GP of Tsundupalli Mandal, Kadapa District, Andhra Pradesh

Facilitating Agency/NGO :

Rayalseema Harijana Girijana Backward and Minorities Seva Sanstha (RHGBMSS)

> "Introduction of new technique of seedling transplantation - a viable alternative to traditional seeding.

In April 2017, Kolimitta Bidiki Climate Proofing Project, approved by NABARD, was launched in Madithadu GP of Tsundupalli Mandal, Kadapa District, Andhra Pradesh.

M. Sreenivasulu is a resident of Matamma H/W Village and his family members own 5 acres of land. Sreenivasulu was an educated young boy and evinced keen interest in agricultural activities. He used to attend VWDC meetings conducted by agricultural department on crop rotation and accordingly modified practices.

Normally, in this region, Redgram crop is grown as a rainfed crop in the Kharif season by sowing seeds and the yields are about 4-5 quintals per acre due to low soil fertility. This new technique resulted in increase in crop yields up to 13-14 quintals per acre. Recently, the farmers were trained on new techniques of seedling transplantation for Redgram and these were practised by some farmers of Chinnamandem and Veeraballi Mandals. VWDC and RHGBMSS staff introduced a new method of cultivating Redgram in Tsundupalli Mandal. This caught the interest of M. Sreenivasulu. He raised Daincha (Jeeluga) in one acre land and ploughed the standing Dhaincha crop into the soil. After one month, he applied two tonnes of FYM and kept the field ready for Redgram transplantation. This method was practised by farmers of Chinnamandem and Veeraballi Mandal too. This process of transplantation is economically favoured and a viable alternative to traditional seeding. It achieves increased yields and enhanced quality with low costs.

Sreenivasulu purchased around 2,500 nos. of 35 days old seedlings of TRG-59 Redgram from the nursery of Smt. Chennakrishnamma at Matli Yellampalli in Veeraballi Mandal and planted these seedlings in July 2017. He provided irrigation to the crop through drip irrigation system. Looking at the growth of the crop, his field was visited by farmers from his own village and nearby villages. After five months, the crop was harvested in December 2017. The farmer reaped a yield of around 8.5 quintals per acre against the normal yield of 4-5 quintals, per acre. He kept 50 Kgs of seed for use by his family and sold the remaining 8 quintals in the market at ₹ 4,500 per quintal, thus earning ₹ 36,000.

NABARD is working towards making this area self-sufficient in agriculture with improved technologies and thus ensuring food security in the region.

₹ 36,000
Earnings per acre

4 quintals per acre
Increase in Red gram yield

Enterprising with Crop Diversification

Boda-Jarhadih Watershed

Location :

Boda Manapara Village, Surguja District, Chhattisgarh

Facilitating Agency/NGO :

Manav Sansadhan Sanskriti Vikas Parishad (MSSVP)

> "Adoption of crop diversification for climate change and good farming practices led to greater crop yields & financial stability of the farmer.

Rajeshwar Ram is one of the beneficiaries of the KfW Soil project implemented in Boda Manapara Village, of Boda-Jarhadih Watershed, Surguja District, Chhattisgarh. He and his familly of six members own six acres of land, but he could cultivate crops only on two acres of land - the rest was wasteland.

Through the KfW Soil Project, this year Rajeshwar Ram has been able to grow cucumber along with paddy crop in his field by using vermicompost and seed treatment. Vermicompost is an organic manure, which returns valuable nutrients back into the soil, promoting the growth of healthy plants. Rajeshwar learnt crop diversification for climate change adaptation and this was the first time, he cultivated cucumber in his field. Cucumber requires a moderate to warm temperature ranging from 20 to 24°C. He was guided on using manure and keeping the farm clean. He prepared the field thoroughly by ploughing the land around four times. Before sowing, he treated the seeds with Trichoderma, which increases seedling vigour and ameliorates abiotic stress thereby enhancing seed survival and healthier plant growth and yield.

Rajeshwar Ram had no knowledge of Azolla farming or how Vermicompost could be used in cultivation of crops. Earlier, he used chemical fertilisers for cultivation of crops due to which the soil had become hard.

The facilitating agency organised exposure visits to nearby fertile farms. This gave him first-hand knowledge and helped him to understand the techniques of good farming practices. To begin with, on an experimental basis, Rajeshwar applied Vermicompost on a small piece of his land. After obtaining a good crop, he is now using Vermicompost on his entire land and has discontinued the use of chemical fertilisers. He was very appreciative that this project educated him in new techniques of farming unknown to him. This learning has made him self-sufficient and improved his standard of living.

Earlier, he was cultivating paddy and earning around ₹ 10,000 to ₹ 20,000 a year. But this year, he earned nearly ₹ 45,000 to ₹ 50,000 through sale of one more crop i.e. cucumber. He expresses: "The benefits I received from going organic and cultivating cucumber have resulted in improved soil fertility and increased yields, thereby enhancing my income. My farm looks green even in summer." Now he feels financially much more stable and can take good care of his family.

₹ 50,000

Earnings from first cultivation of cucumber in 2 acres

Vegetable farming - Source for Stable Income

Barpani Watershed

Location :

Barpani Village, Sarangarh Block, Chhattisgarh

Facilitating Agency/NGO :

Raigarh Sahyog Samiti (RSS)

> "Adequate water for farming. Villagers stopped migrating to other regions. Good earnings made savings possible.

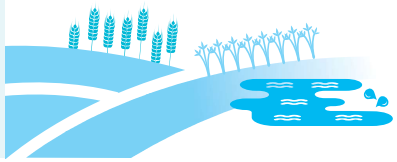
Fifty-five tribal families live in Barpani Village, which is situated on a plateau, about 28 kilometres away from Sarangarh block in Chhattisgarh. There were huge natural water resources in this village, but villagers were unable to tap these efficiently. Most of the cultivated fields had broken bunds and there was no bunding on the barren land. The unfortunate financial condition of the villagers prevented them from improving their farms. They were migrating to nearby towns such as Timarlaga, Gudeli, Bilaspur, Dahli, as well as Jammu and Bihar in search of livelihood. NGO Raigarh Sahyog Samiti (RSS) stepped in to help them through the Watershed Development Programme of NABARD.

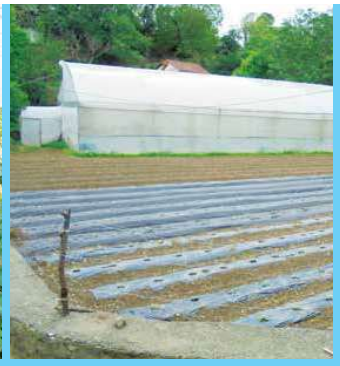
Farm Bunds were constructed in the village on barren land, a popular technique used in agriculture to check surface run-off, increase water infiltration and prevent soil erosion. To reduce the rapid flow of water, Stone Gully Plug, Gabion structures and check dams were constructed. Farm ponds were also built. The watershed programme also provided employment to the people.

Villagers could now earn enough money to support themselves and stopped migrating to other states. Anjor Bariha, a farmer too had enough water to cultivate his field. He started growing vegetables like potato, chilli, tomato and brinjal in the first year and earned ₹ 7,000 profit on selling these vegetables. Soon he could save money and open a bank account. Vegetable farming is now one of most successful income generation activities in this district.

The efforts of NABARD in implementing the watershed project and timely support and guidance extended by the NGO RSS made the villagers financially independent. Vegetable farming provided an avenue for stable earnings.

₹7,000
Profit to the marginal farmer on sale of just one crop of vegetables





Socio-economic Empowerment

Unleashing Opportunities with Integrated Farming

Chithalai Watershed

Location :

Urappanur Village, Madurai District, Tamil Nadu

Facilitating Agency/NGO :

Association for Sarva Seva Farms (ASSEFA)

"With facilitation from ASSEFA under NABARD project, I have availed a bank loan from Canara Bank and took on lease a land to produce fodder. My daily milk production is around 50 litres and I sell it at a farm gate price of ₹ 24 per litre," Parthiban said.

Parthiban, a 44-year-old farmer from Urappanur Village of Madurai District, Tamil Nadu, holds a diploma in mechanical engineering and a BBA degree. He lives in a farm house with his mother and owns a 2 acre plot of ancestral property. Earlier, he worked as a labour contractor in a big spinning-cum-weaving mill in Madurai and earned a commission by mobilising women workers to the mill. Later on, improved road connectivity, newer opportunities for women, and slackened labour requirement, made his work less remunerative.

Motivated by the PFA ASSEFA and NABARD Watershed Project staff, he planted numerous horticultural crops in his land utilising the water of the dug well. With the land being little alkaline and prone to erosion, Parthiban constructed field bunds and trenches on the land for water storage.

On finding that the shade given by the growing horticultural plants and a vast fenced-off ranching area is ideal for the poultry birds, Parthiban established a poultry shed and started with a batch of 200 desi chicken stocks. Following the growth in his income, he enlarged the batch size and earned steady profit.

Horticultural crops have started yielding fruits, which are sold at the farm gate, along with poultry birds. Parthiban's endeavour in providing farm fresh produce to consumers daily has enabled him to establish healthy relationship with his customers. Income from poultry has encouraged Parthiban to venture into dairy farming. Facilitated by ASSEFA, Parthiban has availed a bank loan from Canara Bank and leased in a land to produce fodder. He has been earning a handsome income from milk production and happily says, "Once again I came back to agriculture in my village".

₹ 1.50 lakh
Net profit earned per batch from poultry farming

50 litres
Daily milk production

Unearthing Prosperity with Farm Ponds

Gala-Shivpur Watershed

Location :
Shivpur, Jashpur District, Chhattisgarh

Facilitating Agency/NGO :
Raigarh Sahyog Samiti (RSS)

> The improvement in Shani Ram's economic condition enabled him to free his mortgaged land and buy his own bullock cart. Shani Ram's success is contagious. Seeing him prosper, more farmers in the village have been inspired to take up fishery.

Farmers across India are recognising the imperative to diversify their income for a better life. Shani Ram Paikra is among the many farmers who have successfully enhanced non-farm income with the help of NABARD's WDF project interventions.

A marginal farmer with agriculture and manual work as his only livelihood source, Shani Ram was struggling to make both ends meet. In 2016-17, NABARD constructed a farm pond in his field as part of their efforts to boost farmers' income and store and manage water better. Raigarh Sahyog Samiti (RSS) facilitated the entire project and also advised Shani Ram to start raising fish in the farm pond. For this, Shani Ram was provided with 4 Kgs of fish seed by the Fishery Department.

The simple solution of digging a farm pond has worked wonders for Shani Ram. During the period July 2017 to February 2018, the farm pond produced 185 Kgs of fish, enhancing his income by ₹ 24,000. The improvement in Shani Ram's economic condition enabled him to free his mortgaged land and buy his own bullock cart. He has also deposited ₹ 7,000 in Chhattisgarh Gramin Bank for his son's higher education.

Shani Ram's success is contagious. Seeing him prosper, more farmers in the village have been inspired to take up fishery. The farm pond has also contributed towards increasing the groundwater level, thus helping him keep his farm activity ticking even during a dry spell. Shani Ram remains grateful to NABARD and Raigarh Sahyog Samiti for their contributions in improving his quality of life.

185 Kgs
Fish produced in the farm pond in ~ 8 months

Bee-keeping -A Lucrative Livelihood

Kendapani Watershed

Location :

Kendapani-Jampani Village, Raipur District, Chhattisgarh

Facilitating Agency/NGO :

Raigarh Sahyog Samiti (RSS)

> "Bee-keeping proved to be lucrative and a gainful occupation for villagers. Watershed project transformed an under-developed village.

In order to achieve the objectives of NABARD's WDF programme to conserve soil and water, Raigarh Sahyog Samiti (RSS) initiated the Watershed project in Kendapani-Jampani Village in Jashpur District of Chhattisgarh State. An unemployed youth Ajay Ram lived here with his five siblings in difficult conditions.

This village was under-developed and inaccessible. The Watershed project of NABARD took the village and its inhabitants on the road to development and progress. As part of employment generation and creation of livelihood activity under the programme, bee-keeping training was organised for the villagers. Honey bee farming is gaining importance due to demand for honey and other products in the national and international markets. Bee-keeping is useful to farmers as it increases agricultural production too through better pollination.

This training proved to be useful in changing the life of Ajay Ram. While learning, Ajay Ram received a 3x3 Bee-keeping kit, which helped him to produce 12 Kgs of honey. He sold it at ₹ 400 per kg and earned ₹ 4,800. Ajay Ram felt encouraged to take up Bee-keeping as a gainful occupation and sell larger quantities of the honey through the FPO and get proper value for this product.

He was extremely grateful to NABARD for implementing this watershed project in his village and to the RSS for providing him suitable training on Bee-keeping, which has helped him to become resourceful and financially secure. It has equipped him with a gainful occupation, which will give him and his family a better life free from the shackles of poverty.

₹ 4,800

1st Income as a start from the kit received under the project

Pisciculture - A Gainful Livelihood Opportunity

Bhandan Watershed, Tulasibani

Location :
**Tulasibani Village, Podagada GP,
Jasipur Block, Mayurbhanj District, Odisha**

Facilitating Agency/NGO :
SAMBANDH

> "Bucharam has now become a role model in his village and guides his fellow farmers. His family can also enjoy the benefits of eating fresh vegetables daily. All these initiatives have improved his standard of living and made his family comfortable too. Bucharam is an epitome of success for other farmers to emulate.

Bucharam Singh, aged 48, is a small but progressive farmer with 3 acres of agricultural land. He resides in Tulasibani Village, of Jasipur Block in Mayurbhanj District, Odisha. He used to cultivate only paddy in Kharif season in his land, out of which 2 acres were non-irrigated and totally dependent on the mercy of the monsoon. At times, he was able to cultivate summer paddy in one acre only with irrigation. He could hardly save maximum 5 quintals of paddy per year for sale after his household consumption. He just managed to meet his household requirements, with a family of six members. Therefore, to make both ends meet, in the lean season, he worked as a wage labourer.

Under NABARD's Tulasibani Watershed Project, a farm pond of 50' x 60' size was dug in his field. Through this project, a Vermicompost pit was also constructed. With motivation and technical support of the project team, Bucharam got actively involved not just in agriculture but also in Pisciculture - a process of breeding and rearing fish commercially by artificial means - in his farm pond.

In the first year, he reared Rohu and Katla varieties of freshwater fishes. His zest led to his learning of best practices in Pisciculture and he carefully observed the same. With locally available materials, he prepared fish-feed from cow dung, ground nut extracts etc. and applied the same in the pond for the better growth of fish together with some fish feed purchased from the market. Since he observed the guidelines of Pisciculture carefully, through sincere efforts, he obtained significant results. He got a yield of 3 quintals of fish which he sold for ₹ 36,000. Thus, he made a net profit of ₹ 30,000 on an investment of ₹ 6,000 for purchasing fingerlings and feeds.

He managed to clear his loan, which he had taken from Large Area Multipurpose Cooperative Societies (LAMPS) for cultivating paddy in Kharif and also purchased one electric pump set.

He invested a part of his profit in growing fish in his farm pond for the second time. This time, he got 5 quintals of fish. Encouraged with fishery, he has started growing paddy and vegetables in summer in 2 acres of his land near the farm pond with satisfying crop yields in his field. The Agriculture department of Mayurbhanj District was impressed with his initiatives and awarded him for his enterprising spirit.

₹ 30,000
Net profit on an investment of just ₹ 6,000 on fingerlings and feeds

Ploughing Success with Power Tiller

Saryanj Sarma Watershed

Location :

Damlana Village, Solan District, Himachal Pradesh

Facilitating Agency/NGO :

Ambuja Cement Foundation

> "Paras Ram is now able to plough his land on time. He also provides tilling services at more reasonable rates (₹ 400/day as against ₹ 550/hr earlier) in his village as well as in the adjoining areas.

Saryanj Sarma Watershed in Solan District of Himachal Pradesh covers an area of 1,132 hectares and 1,150 households in 17 villages with population of 5,205. Paras Ram, a 65-year-old resident of Village Damlana, was one of the first members to become part of the Saryanj Sarma Watershed Development Project in the year 2014. He was elected as a member to the Village Watershed Committee (VWC) Previously, he had worked as a house-keeping supervisor at the Oberoi Hotels Group, Shimla.

Innovative and progressive by temperament, Paras Ram was always in search of alternative livelihood opportunities. During a VWC meeting, he expressed his dissatisfaction that farmers in Damlana paid thousands of rupees as power tiller hiring charges. Despite paying steep charges of ₹ 550/hour, tillers were unavailable on time. He proposed to purchase a power tiller and asked for support from the committee. The idea was appreciated but since there was no such provision in the project, it was decided to take up this issue with the Department of Agriculture/Horticulture.

When discussed with the officials of Department of Horticulture, it was found that there was a provision of 60% subsidy on the purchase. List of approved models was collected, following which Paras Ram purchased a new 6 HP power tiller of Angad Brand worth ₹ 1 lakh from a dealer in Kunihar.

Paras Ram is now able to plough his land on time. He also provides tilling services at more reasonable rates (₹ 400/day as against ₹ 550/hr earlier) in his village as well as in the adjoining areas. By growing cash crops like tomato, ginger and calocasia, etc., Paras Ram is today earning a steady agricultural income of ₹ 40,000-50,000 per season.

₹ 40,000 – ₹ 50,000
Per season - steady agricultural income

₹ 20,000 – ₹ 25,000
Supplementary income earned through tilling services

Women Empowerment through Organic Farming

Narukot Watershed

Location :
Mankodi Village, Kawant Block, Chhota Udaipur, Gujarat

Facilitating Agency/NGO :
Deepak Foundation

> "The training by Deepak Foundation team through IGWDP watershed project has given a learning environment to me as well as to all women of the village. It has really empowered us to choose our own path of development and progress.

Geetaben Ashwinbhai Rathwa, a young woman aged 34, lives in Mankodi Village, of Kawant Block, Chhota Udaipur District of Gujarat state. She had school education and was an active member of women training programmes and similar activities supported by NABARD for vegetable cultivation under IGWDP. She and her husband are farmers with a family of 6 members. Her enthusiasm and learnings out of IGWDP training received through NGO Deepak Foundation, transformed her into a Community Resource Person (CRP) in a Government programme, where she is working for the last three years.

Geetaben worked as 'demonstration farmer' under this programme to provide evidence that sustainable agriculture practices are ideal for the less privileged as there is cost saving, maximum output and sustainable future. She has been a role model to the Women Farmers' Groups and provides them hands-on experience in a demo plot of 36 square feet to motivate them to shift towards organic farming techniques and reduce the cost of inputs in agriculture drastically. Women receive training on chemical-free pest management, soil fertility management and integrated farming systems.

With this valuable knowledge and by adopting organic farming, women in Village Mankodi, are now able to generate average income of ₹ 18,000 to ₹ 33,000 per annum. Geetaben's leadership quality has helped to transform them by learning new techniques of farming. Geetaben is overwhelmed and expresses her sentiments: "The training by Deepak Foundation team through IGWDP watershed project has given a learning environment to me as well as to all women of the village. It has really empowered us to choose our own path of development and progress".

₹ 18,000 to **₹ 33,000**
Average income of Women in Mankodi Village per annum

Goatery Empowers Women

Motihandi Watershed

Location :
Motihandi Watershed Project, Dahod District, Gujarat

Facilitating Agency/NGO :
N. M. Sadguru Foundation

> "Glorious achievement! Nandaben became a proud owner of a house, 11 goats & bucks, besides educating her children.

Nandaben is a member of Shree Motihandi Nanihandi Mahila Vikas Mahila Sangh, a Self-Help Group (SHG) promoted by the NGO N. M. Sadguru Foundation in Dahod District. Though her husband was earning ₹ 50,000 annually, he had to borrow money from the money lenders for meeting their household requirements. In 2011, under the IGWDP programme, she became a part of the Self-Help Group and began saving regularly from her income.

Nandaben learnt about the goatery intervention under the IGWDP programme. Under this initiative, 16 goats and 4 bucks in total were provided to 20 beneficiaries by taking an amount of ₹ 2,000 as cash contribution for each goat or buck from the beneficiary. Since she could not get a second loan from money lenders, Nandaben sold her ornaments and bought a healthy goat of the Sirohi breed. She observed that the Sirohi breed gives one or two babies every six months and more than a litre of milk every day. She earned a profit of ₹ 35,000 and became a proud owner of 11 goats and bucks.

Her cumulative income from goat rearing touched more than ₹ 1,00,000 per annum. This gave her financial freedom to undertake gainful work like deepening of wells, buying agricultural inputs, necessary household items, and also increased her capacity to repay her loans. She educated her children and constructed a house for her family. Since she was regular in repaying loans, she easily managed to get additional loans from the SHG Federation for about five times in a row. She can now use this extra money for developing agriculture and livestock, which would further enhance her earnings.

More than
₹ 1,00,000 per annum
Cumulative earnings from goat rearing

Tackling Erratic Rains and Precarious Livelihood

Adavikammapalli Watershed

Location :

Gandlapalli Village, Adavikammapalli Watershed Project, Kadapa District, Andhra Pradesh

Facilitating Agency/NGO :

Rayalseema Harijana Girijana Backward and Minorities Seva Sanstha (RHGBMSS)

> Prior to KfW Soil project, borewells were drilled to a depth of 800-1000 feet to strike water, but now water is visible at a depth of 100 feet from the ground surface. Even though, the surrounding villages are facing the challenges of a drought, villagers in Adavikammapalli in the KfW Soil project have sufficient water.

M. VenuGopal is a determined farmer of Gandlapalli Village, Adavikammapalli Watershed, Kadapa District, Andhra Pradesh. He was unable to cultivate crops in his 4-acre field due to insufficient, erratic rains and continuous droughts. Because of low rainfall and excessive drought, the groundwater table fell below the normal level.

The PFA Rayalseema Harijana Girijana Backward and Minorities Seva Sanstha (RHGBMSS) suggested changes to him under the KfW Soil Project. Later, he approached the VWDC of Adavikammapalli KfW Soil project for a revolving fund assistance of ₹ 40,000 under the livelihood programme. With this money, he purchased a Jersey cow and maintained it in good health. Daily, he obtained 30 litres of milk and earned ₹ 600. His monthly income from the cow was ₹ 18,000. He maintained the cow for 2 years and received ₹ 4,32,000 as income from milk and ₹ 10,000 from disposing of the cow dung. He made a net profit of ₹ 3 lakh after meeting all the expenses and became a role model in the village.

Meanwhile, to solve the problem of acute water shortage, rainwater harvesting bodies were constructed under the KfW Soil Project programme. This led to the increase in the groundwater levels in the watershed project. Prior to this, bores were drilled to a depth of 800-1000 feet to strike water, but now water is visible at a depth of 100 feet from the ground surface. Even though, the surrounding villages are facing the challenges of a drought, villagers in Adavikammapalli in the KfW Soil project have sufficient water. The whole situation has reversed only due to the implementation of water harvesting structures.

The practice of rainwater harvesting is an important and integral part of developing a sustainable water resource for any community. As local water resources are stretched, new water supply strategies and paradigms are necessary to meet this demand and promote economic development. Rainwater harvesting is an untapped resource, which will need to be quickly developed within communities with tremendous impact. Rainwater harvesting is a sustainable water supply strategy for the local communities.

₹3 lakh

Net profit from one cow in 2 years

Shade Net Nursery - Nurturing Seedlings for Prosperity

Mittapalle Watershed

Location :

Thoppannagaripalle Village, Mittapalle Watershed, Chittoor District, Andhra Pradesh

Facilitating Agency/NGO :

Gram Vikas Sanstha

"1,00,000 quality seedlings of different crops supplied to farmers at nominal cost - thanks to Shade Net Nursery.

Ramesh is a young farmer residing in Thoppannagaripalle Village in Mittapalle Watershed, facilitated by the NGO Gram Vikas Sanstha, in Chittoor District of Andhra Pradesh. He owns 3 acres of agricultural land with one borewell, and produces Groundnut, Tomato, and vegetables in his field. He is an innovative farmer and a member of Mittapalle Watershed Committee.

Ramesh is a good facilitator too, coordinating with local institutions and departments to meet the needs of his fellow farmers. When the farmers expressed their concerns regarding shortage of quality planting material, especially of tomato during peak season, he came up with an idea of studying its causes and quickly assessed the requirement of tomato nursery seedlings in the watershed area. During the study, he found that farmers are travelling to far off places to procure seedlings and sometimes transplanting was delayed due to non-availability of seedlings. This issue was discussed with the fellow farmers in a meeting and he came up with an idea of starting a local nursery of different crop varieties as per the requirement of farmers.

A viability study was conducted and it was found feasible to start a nursery at an estimated cost of ₹ 90,000, as per the requirements of the watershed area. He requested the watershed committee to provide support to the Shade Net Nursery. Members agreed to this project as part of NABARD-KFW-Soil project. They decided that Ramesh could establish Shade Net Nursery with a contribution of ₹ 29,000 from project funds and suggested that the remaining amount be mobilised from other sources. He agreed to the proposal and raised the amount of ₹ 61,000 from his own sources.

On 15th January, 2018, Ramesh established the Shade Net Nursery in his land, which is easily accessible to the villagers. He raised one lakh seedlings of vegetables like Tomato, Brinjal, Chilli and other vegetables and supplied these to the farmers of the watershed area at a cost of ₹ 0.30 per seedling. In an interval of every 45 days, he has been raising one lakh seedlings and supplying it to the farmers. The expenditure to raise seedlings every 45 days was approximately ₹ 15,000 to 18,000 with an income of around ₹ 30,000 to 35,000. On an average, he earned ₹ 15,000 in a cycle of 45 days.

Agriculture Department officials visited his nursery and were very much impressed with the way in which it was maintained. Ramesh underwent training in Zero Budget Natural Farming (ZBNF) organised by Agriculture department. Local farmers expressed that the seedlings supplied by Ramesh from his nursery were of good quality, reasonably priced and easily accessible to the watershed farmers. Ramesh and his family members are totally involved in the management of this nursery. They are providing local farmers with quality seedlings and earning a reasonable income.

Ramesh is happy that he was able to establish this unit as a source of stable income and regular employment. He is thankful to KfW Soil project for their initial support to help him start this enterprise, where his entire family works together. Moreover, it has proved to be a sustainable livelihood opportunity.

₹15,000

Earnings in a cycle of 45 days

Vermicompost - Nutrient Rich Organic Manure

Damgarh Watershed

Location :

Damgarh Village, Kabirdham District, Chhattisgarh

Facilitating Agency/NGO :

Community Advancement and Rural Development Society (CARDS)

> Vermicompost - a nutrient rich organic manure and soil conditioner, which improves the biological, chemical, and physical properties of the soil.

Fatteram, a resident of Damgarh, Kawardha District, Chhattisgarh, shares his gainful experiences under the Damgarh KfW soil project. He has benefited immensely by learning to cope with adverse situations of climate change in his village. He is grateful to the NABARD and the implementing agency, Community Advancement and Rural Development Society (CARDS), for giving him a chance to enhance his livelihood as also development opportunities for himself and other farmers around him.

NABARD is implementing a range of useful activities in Damgarh Village: creating soil and water conservation structures, soil improvement techniques, conducting training on alternate livelihood practices, developing group-based efforts on livelihood enhancement programmes, modern agricultural practices, safeguarding the environment, soil protection, and water management.

Vermicompost is an organic manure, which improves the biological, chemical, and physical properties of the soil. Fatteram came to know that with adoption of vermicompost, crop yield increased substantially due to increase in soil fertility. After training, he started making Vermicompost and even sold it to other farmers during the last season. He sold 8 quintals of Vermicompost and earned approximately ₹ 9,000, which is an additional income for him. He feels confident and plans to expand this business in future along with increased application of Vermicompost in his own farm to improve the production of crops.

He is most grateful to CARDS and NABARD for imparting training and supporting him in this lucrative venture of setting up the Vermicompost production unit which has increased his earnings and made him self-sufficient and self-reliant.

₹ 9,000

Additional earnings from sale of 8 quintals of Vermicompost besides increased crop yield in his own farm

Backyard Duckery - Where there is a will, there is a way

Handipuhan Watershed

Location :
Handipuhan Watershed, Odisha

Facilitating Agency/NGO :
SAMBANDH

> "Sunaram, a daily wage labourer, can now afford luxurious items like a television and bike. He is very contented and gives all due credit to NABARD and the KfW project for giving a new meaning and direction to his life.

This popular slogan "Where there is a will, there is a way" is proved true by Sunaram Murmu of Handipuhan KfW project area in Mayurbhanj District, Odisha. He was hardly known in the village two years ago, but now he has become a familiar name in his village. Though he had half an acre of agricultural land, the crop produce was not sufficient enough to provide food throughout the year for his family of 4 members (including his wife and two children). Hence, Sunaram undertook labour work on daily wage basis. The implementation of the KfW Soil project by SAMBANDH in his village gave a new dignity to his life. This was not merely due to his good luck, but sheer hard work enabled him to capitalise on such an opportunity. Under the project, he was supported with 20 ducks as part of the Livelihood Support (Backyard Duckery) of the KfW Soil project.

He took adequate care of these ducks and after six months, Sunaram sold 5 male ducks in the nearby market for ₹ 2,000 that is, ₹ 400 for each duck. With this amount, he took a shop on rental space in the village market for running a small shop. He stocked a few stationery items along with food and beverage in his shop and began selling these items together with the duck eggs. This initiative gave Sunaram an income of ₹ 4,500 to 5,000 on a monthly basis and he no longer has to work as a labourer. Both his children are now studying in school. His wife started cultivating a variety of vegetables in their backyard for daily consumption. Sunaram is a member of Village Climate Risk Management Committee (VCRMC) too. He plays an important role in mobilising the community people and supervises the workforce efficiently. Sunaram can now afford even luxurious items like television in his house and a bike. He is very contented and gives all due credit to NABARD and the KfW project for giving a new meaning and direction to his life.

₹ 4,500 to 5,000
Monthly income after implementation of the KfW project

Integrated Fish Farming - Catalysing Farm Income

Makarchuan Watershed

Location :

Banki Village, Jharsuguda District, Odisha

Facilitating Agency/NGO :

Social Education for Women's Awareness (SEWA)

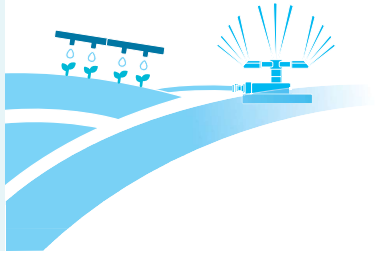
> "I express my immense gratitude to SEWA and Watershed supported by NABARD for such innovative support and facilitation that substantially increased my income.

Nabin Ekka is a permanent resident of Banki Village, one of the watershed villages in Makarchuan Watershed under Jharsuguda District of Odisha State. His primary occupation was paddy cultivation, which earned him a meagre income. Further, cultivation was very challenging for Nabin due to high dependency on rainfall. Meanwhile, SEWA started intervention to enhance livelihood under watershed project supported by NABARD. A special training programme was introduced by SEWA in this regard.

With the facilitation of SEWA and support from OLIC (Odisha Lift Irrigation Corporation), a deep borewell was installed in Nabin's field. Later, a small farm pond was dug out on his request, with the support of Makarchuan Village Watershed Committee. Advanced drip irrigation system, installed by Agriculture Department through the facilitation of SEWA, has further bolstered his efforts in growing intercrops such as brinjal, ladyfinger and chilli.

Moreover, Nabin received about 40 seedlings each of mango and lemon through Makarchuan Village Watershed Committee. The mango and lemon seedlings were cultivated around the farm pond. Fish farming was also initiated in the farm pond. The farm produce are directly taken to the market by Nabin and he receives a fair price for his produce.

Multiple crop cultivation and fish farming have catalysed the growth of Nabin's income from ₹ 25,000 to ₹ 75,000. "I express my immense gratitude to SEWA and Watershed supported by NABARD for such innovative support and facilitation that substantially increased my income." He is encouraged to invest more in agriculture.



₹ 50,000

Increase in Nabin's annual income

Vision

Development Bank of the Nation for
Fostering Rural Prosperity.

Mission

Promote sustainable & equitable agriculture &
rural development through participative financial and
non-financial interventions, innovations, technology and
institutional development for securing prosperity.