

wadi

enabling small farmers to secure their livelihoods...





In Uttar Pradesh, large tribal populations inhabit the Bundelkhand region as well as the lower hills of the Terai Himalayas. These communities are largely dependent on agriculture, forestry and livestock management for their sustenance but the incessant exploitation of natural resources and rapid loss of forest area are posing a grave threat to their lives and livelihoods.

NABARD, under its Tribal Development Programme/Fund has been supporting activities to promote integrated development of these communities.

Since 2009, NABARD has been implementing the wadi development programme in three districts of Jhansi, Sonbhadra and Lalitpur. The efforts invested by the farmers in establishing their wadis of mango and guava trees: thereby ensuring food and nutrition security for their families is worthy of appreciation. In a few years, under the guidance of the programme implementation agencies, more than 8,000 wadis in three district of Uttar Pradesh.

This compendium/photobook of case studies describes the journey through the wadi establishment process and is a humble tribute to their fortitude and earnest efforts.

I congratulate my Regional Office, programme implementation agency Development Alternatives and various development stakeholders at the district level for their contributions made at different levels. I trust that the unrelenting efforts made by you and most importantly the wadi farmers will yield fruit and script new stories of success under the aegis of the wadi development programme.

*- Mr. A K Panda
CGM, NABARD, Uttar Pradesh*



The tribal populations of our country have for long found space only in the margins of the collective consciousness of mainstream culture. As the "development" juggernaut continues to march into hitherto untouched territories, these tribal populations stand to lose their rights not only over their land but also their livelihoods and cultural heritage.

As the nation grapples with issues of sustainable development and challenges such as achieving food and livelihood security of its citizens in a milieu of depleting land and water resources, we cannot afford to ignore the lessons from tribal cultures that have for millennia lived a life that is in harmony with nature and intrinsically sustainable. But ironically, today, these tribal communities are themselves migrating in search of work and food as the natural ecosystems they inhabit face degradation and destruction from unsustainable models of development.

The tribal development programme aims to address this scourge of displacement that is much more than a physical dislocation – it places the tribal household in a cultural milieu that is so different from their traditional way of life that it leaves them disoriented and hugely vulnerable to the aggressive economic forces that govern modern societies.

The wadi model is based on scientific principles of agro-ecology that enables the optimal and sustainable utilisation of the productive potential of land while offering significant ecological co-benefits that help the degraded land itself to regenerate.

*- Dr. Ashok Khosla
Chairman, Development Alternatives*



CONTEXT

Small and marginal farmers with land-holdings of less than two hectares comprise nearly 85% of all farming households in India. With the added impact of climate change, agriculture on small farms has been rendered unviable and also vulnerable to crop failure. Large numbers of farmers are forced to abandon their farms and migrate to cities in search of work, ultimately getting trapped in a vicious cycle of poverty and debt. This means that a significant percentage of small farms are left fallow and not put to productive use, and which over time and continued neglect get degraded into unproductive wasteland threatening overall food security.

This situation is particularly daunting for poor tribal farming communities that have traditionally depended on forest resources for fuel, fodder and complementing the meagre production from their small farms but are today dealing with dwindling forests and water resources.





THE *wadi* PROGRAMME

The Tribal Development Fund of the National Bank for Agriculture and Rural Development (NABARD) has promoted the development of *wadis* for economic upliftment and social empowerment of marginalised tribal communities. The programme encompasses solutions that promote natural resource management, livelihood development and women's empowerment through people's participation.

The wadi model is an agri-horti based sustainable livelihood model that makes farming profitable even on small farms. Its multi-tiered and inter-cropping approach helps ensure the nutritional security of the household by the provisioning of cereals, pulses, vegetables and fruits. The land and water management practices integral to the model lead to regeneration of the land and its productive potential. It reduces climate risks, improves farm productivity and ensures that farmers enjoy a regular flow of income due to diversification of production. The *wadi* model demonstrates tremendous potential as a pathway out of poverty for small and marginal farmers.

Development Alternatives has facilitated the development of over 1,700 *wadis* for tribal families in Uttar Pradesh and Madhya Pradesh under the aegis of the Tribal Development Fund of NABARD.



THE *wadi*

A *wadi* is developed as a 1 acre mini orchard with around 100 fruit trees of guava, mango, gooseberry (amla) or other varieties suited to the region. The space between the fruit trees is used for growing seasonal crops and the periphery is bio-fenced with forestry, fuel or timber species. A combination of cattle protection trenches and farm bunds around the periphery help conserve soil and water and keep grazing animals at bay.

Key Components of the *wadi* Programme

- Soil and Water Management
- Orchard Development
- Sustainable Agriculture
- Fencing and Border plantation
- Human Resource Development/Farmers Collective
- Women Empowerment
- Health and Nutrition Sensitisation



The key features of the *wadi*

Approach - Sound Application of Agriculture Science

The *wadi* model employs scientific methods to optimize production. The selection of appropriate orchard species is based on the analysis of agro-climatic conditions, soil type, slope and drainage. High yielding and early fruiting varieties are adopted along with improved techniques such as integrated and organic farming systems. The seasonal crops for inter-cropping are selected so as to ensure crop rotation with one leguminous crop a year to enrich soil nitrogen levels. As the fruit trees grow, the growing canopy also influences the micro-climate making it possible to grow shade loving high value crops.

A Better Economic Deal for Farmers

The economic viability of the *wadi* model is proven. A typical *wadi* of 1 acre requires an investment of around Rs. 50,000, including initial establishment cost and subsequent maintenance cost over 5-7 years. The financial returns in the first three years are only from the seasonal crops and range between INR 12-15,000 each year. The fruit trees take 4-5 years to mature and start yielding harvests adding an extra revenue stream. By the 7th year, the annual farm incomes go up exponentially to at least INR 60,000 each year.

Rejuvenates the Local Ecology

The land and water management practices that form an integral component of the *wadi* model leads to a host of ecological co-benefits such as enhanced ground water recharge and reduced soil erosion losses. The plantation of trees leads to significant carbon sequestration. Established as clusters, *wadis* also impact the micro-climate leading to improved local biodiversity. The use of organic fertilizers and pesticides and practices leads to gradual improvement in soil organic content and water holding capacity. The *wadi* model is climate resilient and can be adopted on partially degraded lands on which conventional agriculture is not possible and is therefore a suitable solution for reclaiming degraded lands into productive use.





Soil and Water Management

Ensuring water security and reducing soil erosion through development of farm ponds, wells, farm bunds and using organic manure



Investing in water harvesting structures such as farm ponds, wells and jal-kunds help ensure water security which is a prerequisite for ensuring the survival of the wadi through the harsh summers.

For implementing partner Development Alternatives, Bhunna Sahariya was a tough nut to crack. He was resistant to the concept of *wadi* since it did not give him immediate returns. Struggling with poverty, no crop yield, and unavailability of water, Bhunna preferred to migrate to Jhansi for work which gave him instant monetary relief, rendering his land as waste.

DA convince Bhunna Sahariya to dig pits on his land for planting guava and gooseberry (amla) trees by offering Rs.25 per pit. It resulted in Bhunna digging 110 pits. This monetary gain motivated Bhunna Sahariya to continue work on the *wadi* and not migrate.

Eventually, he planted 55 guava and 55 gooseberry (amla) trees in the one acre land he possess, making upto Rs. 10,000 by intercropping the fruit trees with pulses; and Rs. 12,000 in the subsequent year by growing vegetables along with the trees and the pulses.

Once convinced, Bhunna became a change agent in the area propelling other villagers to adopt the *wadi* programme. His efforts led to an increase in the ground water level of the entire area allowing him to dig a borewell and install a water pump. The villagers attached a pipeline to this borewell which ensures water supply to all the 35 families of Rasina village region.





Orchard Development

Planting a variety of suitable tree crops to minimize biological and marketing risks ensuring income and livelihood security under climatic vagaries.

Fruit tree plantations such as those of guava and amla are less vulnerable to climate irregularities than conventional farming regimes. It thus, ensures the farmer against complete crop failure and provides an additional high value income stream thereby enhancing income and livelihood security

Lush green fields amid stretches of dry, parched land is the best way Kallu Ram Sahariya can describe his farm. With pride in his steps and a smile on his face he boasts about it to whoever visits him. He believes post 2011, his life changed for the better.

This was the year National Bank for Agriculture and Rural Development (NABARD) introduced its TDF *wadi* programme in Bundelkhand's Babina district. Frustrated with the unavailability of water and low crop productivity he was one of the first few to enroll into the programme that was implemented by Development Alternatives (DA).

Together NABARD and DA have established 1,000 *wadis* across Bundelkhand, providing food, financial and social security to the tribals of the region.

"I attended village level meetings initially and gathered insights on the *wadi* concepts. The training sessions enabled me to nurture a *wadi* of 110 saplings in an area of one acre," said Kallu. His efforts have led to a full grown *wadi* consisting of 90 Guava plants and 20 Amla trees.

He has further accessorised his *wadi* with a Jackfruit trees growing a water pump for irrigation and a nursery. His coffers have boosted by Rs. 14,000 from his *wadi* giving him the additional income with which he intends to build a *pucca* house.

"The work has already begun. Soon enough my family will move to a *pucca* house while we rent out the other one," said a smiling Kallu.





Fencing and Border Plantation

Providing shelter to the *wadi* and help meet needs for fuel, fodder and small timbers reducing the pressure on existing forests



Border plantations serve multiple functions; besides keeping grazing animals at bay, these shrubs and trees can be sustainably harvested to meet fuel and fodder needs thereby reducing extractive pressures on existing forests. If timber species such as teak and bamboo are planted, they can also become major source of income.

From sourcing and selling forest timber to planting trees, Ramdin Sahariya has come a long way. A resident of the Bajna village in the Babina block of Jhansi District, Ramdin and his wife sourced a living by selling the wood in Jhansi. His two acre farm land, which he assumed to be uncultivable lay waste; his fortunes running as dry as his land.

In 2011, he decided to enroll in NABARD's TDF *wadi* project. He actively participated in all training sessions acquiring skills on agro-forestry, improved agriculture practices and cattle management.

The results are evident. His *wadi* is one of the successful ones in the area, with a plantation of 55 guava and 55 gooseberry plants. Along with this he also cultivated groundnut in the Khareef season and Narendra -2 Jawar in Rabi season. This green patch of his farmland is meticulously protected by a lush green bio-fence on three sides and a stone boundary on one side. The adoption of the programme has increased his income by Rs. 24,000 per crop cycle.

"I build a *pucca* house after my income increased and also got my doughtier married. I also got my daughter married," said a smiling Ramdin. He is optimistic towards *wadi* and is investing in extracting better profit from *wadi* products.

Sustainable Agriculture

Intercropping seasonal crops between trees for supplementary income and ensuring crop rotation with one leguminous crop to enrich soil nitrogen levels.



Promoting sustainable agricultural practices such as use of organic compost, mulching, crop rotation with legumes that help enrich soil nitrogen levels helps reduce chemical load and improve and maintain soil health for sustained productivity levels over the years. Modern technologies such as green shade-net, coco-peat germination trays, high yielding and short duration varieties help adapt to climate variations and realise improved productivity.

Like Ramdin Shariya, Jahar Singh was also a cynic. When NABARD introduced the *wadi* programme in the Prithvipur village of Babina, Jhansi district he was not a part of the group of few farmers who enrolled out rightly. He took his time. Even though he had three acres of land laying waste which could improve his and his family's life, he chose to watch the project implementation from a distance.

"I could never understand the benefits of the *wadi* because I never saw it as fruit bearing immediately," admitted Jahar Singh. He thought *wadi* was a ploy by the government to acquire his farmland. With continuous efforts jahar gradually engaged himself in developing his *wadi* planting He planted 55 Guava and 55 Amla saplings on his farm. Apart from this he also sowed groundnut.

While his *wadi* was under development since he sold his groundnut for Rs. 8,000 and with the extra cash he dug a well.

Watching his effort and change in mind DA further linked him to the Micro-Irrigation Department.

Today, Jahar is a proud owner of a full grown *wadi* that has been equipped with a well for irrigation.

He has graduated to growing seasonal vegetables and cereal crops along with Guava and Amla. With a multiple source of income Jahar has ensured his farmland has crop in every season.









Human Resource Development/Farmers Collectives

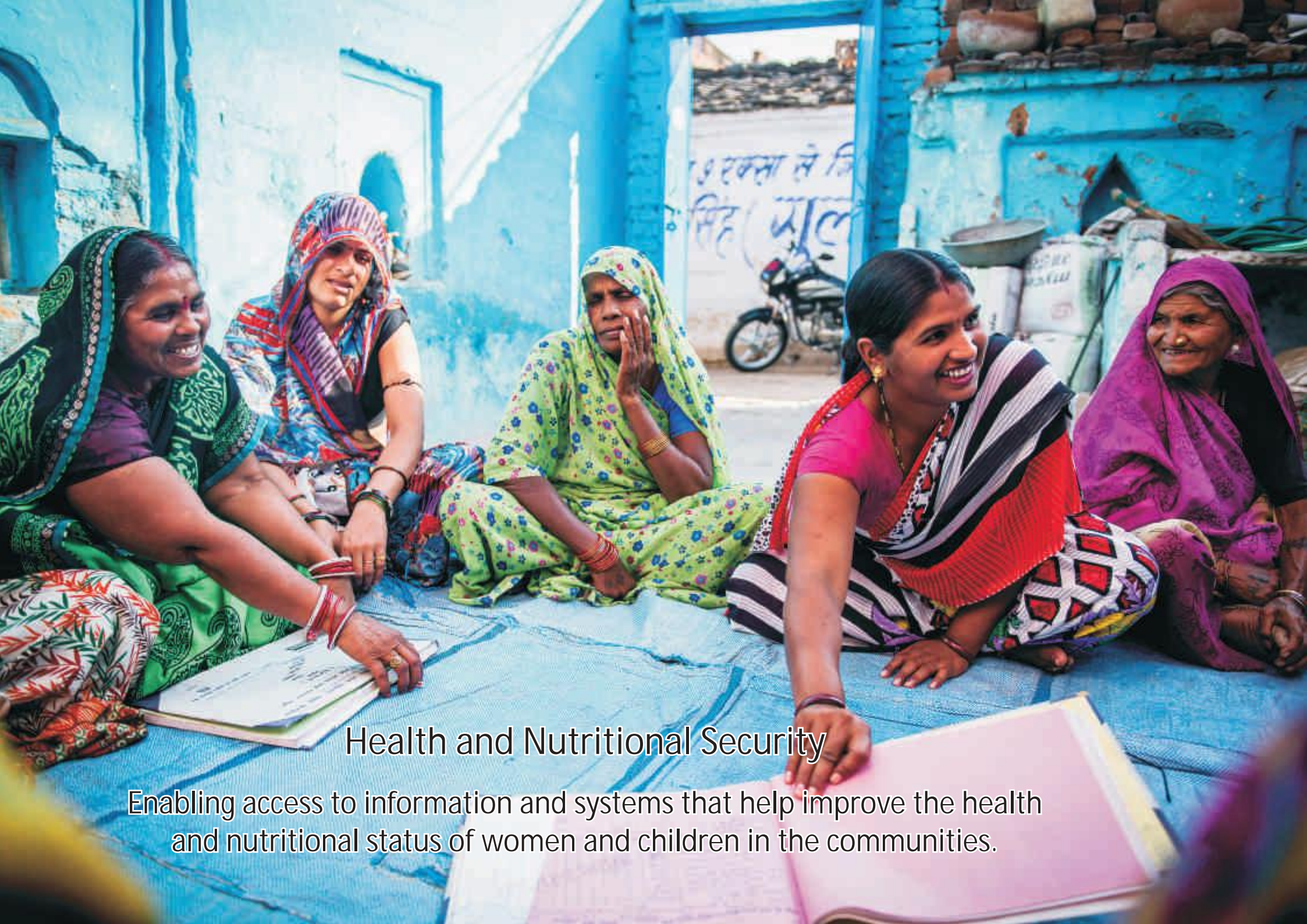
Promoting social cohesion and develop farmer aggregation platforms for collective access to formal and extended markets.



Formation of community institutions such as wadi farmers' groups enable the farming community to collectively access formal and extended markets and also improved production technologies and agri-services.

Under the wadi program farmer groups comprising of 122 members were formed in eight village where the wadi was implemented. The farmers along with other villagers, accounting upto 240 members, have been aggregated under an umbrella organisation called the Sahariya Vikas Manch. This 240-member strong group enable farmers to undertake regular activities:

- Wadi maintenance work and training
- Marketing of vegetable and fruit products in bulk to Babina and Jhansi
- Members of Sahariya Vikas Manch actively participate in local self governance processes--raising issues of the community
- Four members got elected recently in a panchayat election
- One of its member - Bhaiyalal Sahariya of Nayakheda village came forward and fought the Sarpanch election in 2015 and won it.



Health and Nutritional Security

Enabling access to information and systems that help improve the health and nutritional status of women and children in the communities.



An important component of the *wadi* programme is health awareness. Merely providing a source of income and food is not the project's intention. The idea is to uplift marginalised communities to better and healthier living conditions. One of the components is to discourage the use of smoke *chulhas* and adopt smokeless stoves which are healthier, efficient and better for the environment.

Ms. Viniya Sahariya's is one of the early adopters to understand the benefits of smokeless stoves. Realising the ill effects on her health due to the smoke she readily installed a smokeless stove in her house. Apart from cooking clean food and using less fuel wood she is glad about the fact that her eyesight and breathing aren't being inflicted damage due to smoke.

"It does not leave black spots on the walls of house or irritate my eye sight. Significantly, me and my children do not fall unwell frequently as we used to before," she said.

Under the health awareness component, a number of campaigns were organized in Jhansi. The one worth mentioning is the campaign held at Nayakhera Prithvipur, Block- Babina, Jhansi. The campaign was attended by 126 people from nearby villages of Sekhar, Koti, Badhera and Pura. Organised in convergence with the office of the Block Chief Medical Officer, CHC, Babina the villagers were provided with awareness, diagnosis and treatment facilities.

Impact of the campaign:

- Awareness and counseling towards health and hygiene
- Door step cure and treatment of health problems
- Convergence with line departments for the sustainability of *wadi* programme
- Ensure access to health services to underprivileged community.



Women Empowerment



Promoting women self help groups and building capacities for financial inclusion and socio-economic empowerment



Sensitizing and building capacities of women are crucial in ensuring that the economic benefits that the wadi model provides get re-invested in social needs of the family such as health and education.

Empowering a woman is empowering a family and generations to come. Especially in rural areas where social ills like gender discrimination, illiteracy and poor health are prevalent. Targeting all three NABARD's *wadi* came up with another component to the project 'women's empowerment.'

The implementation of this component commenced by conducting regular meetings with the women of village Palinda in the Jhansi District. One particular meeting held in March, 2011 resulted in the formation of the Shakti Mahila Self Help Group.

The group comprising of 10 women started regular savings of Rs. 50/- every month. This provided the much needed financial security and awareness to women—inducting them in the basics of financial literacy. Soon enough the process of inter loaning began acting as financial stability at times of crisis and extra expenses like marriages, medical treatments, house retrofitting and in some cases investing in land.

The women of the village had found an alternative to loan sharks. This expanded the horizon for them. Some women utilised their savings in establishing their own businesses which had better returns and more savings.

Again DA and NABARD played an instrumental role in training and helping women identifying potential businesses they could enter. Most of them opted for the *badi papad* business and ran their business successfully. With better access to local markets the SHG members developed a regular and loyal clientele—resulting in a domino effect of social change.

The villagers are now aware citizens with lesser gender discrimination. Children now go to schools learning about the world, good health and benefits of safe drinking water.



50+ villages in 3 districts

1700+ acres under climate resilient farming

1700+ tribal farmers engaged

25% increase in farm returns

80% reduction in migration amongst beneficiary population

5-7 years is all it takes



STORIES OF CHANGE

Mr. Kailash Sahariya lives with his family in village MajraKoti. He owns approximately 1.5 acre of land in the village periphery which lay barren for a long time due to the unavailability of water. The low agricultural output and lack of employment opportunities had forced him and his family members to migrate to metropolitan cities like Indore, Delhi etc. He specifically mentions that the regular migration resulted in the failure of providing education to his children.

But in August 2009, his fortunes changed with the implementation of the TDF *wadi* programme in his village. He actively participated in the village level meetings and training programmes of the *wadi* development. He also attended different exposure visits to understand the WADI development. In the following years he took a pledge to enhance his life by developing his own *wadi* in the one acre of land. The community in his village made fun of his *wadi* initiative since it was a new concept for all of them. However he acted as a change agent motivating many to adopt a *wadi*. At present, through the *wadi* he earns an extra income of Rs. 15000; and the agro-forestry model ensures income return even in adverse climatic conditions.

He has now invested the extra income in the education of his wards.





Mr. Tulsi Ram is a resident of village Shekhar in Babina block. He resides in the village along with his family which includes four children (two boys and two girls) and a wife. Before 2011 his family's economic condition was deplorable. Due to low agriculture productivity and lack of employment opportunities in the village, Tulsi Ram struggled to feed his family well. This forced him to migrate to cities like Bhopal, Delhi in search of work as a daily wage labourer.

However, the TDF *wadi* programme got his back to his village. He got the requisite training and undertook the *wadi* plantation. He planted 70 plants of Guava and 40 plants of Amla. He understood the technical specification well and intercropped his *wadi* with wheat with a *wadi* plant at every six meters.

When his crop and fruits matured and came to harvest he made a bumper profit of Rs. 15,000. This has motivated him to develop and maintain his *wadi* and source a living from his village. He has stopped migrating to the city and lives with his children, wife and sister in the house he grew up. Giving his young ones the childhood he had by the countryside.



By planting a *wadi* Kalicharan nurtured his life. His land became cultivable boosting his fortunes; and his children started going to school paving a way for a bright future. This scenario stands in contradiction to Kalicharan's plight before 2011, when he was struggling to provide two square meals a day to his family.

When the TDF *Wadi* project intervened he showed interest and discussed about his waste land with the experts. Under their guidance he dug 100 pits to plants 55 Guava trees and 55 Amla plants. Alongside his wife and son started inter cropping wheat and groundnut in the farm.

When both the crops matured Kalicharan's spirits lifted since he sold more yield than he ever had before. The fruits and the crop got Kalicharan a good profit altering his life for good.

Gradually, he invested the money in a *pucca* house, his children's education and most importantly a motorcycle. He stands proud boasting about his bike standing in front of his lush green farm land.



The Opportunity

The tribal population of India is a staggering 80 million. A large proportion of this population is facing severe livelihood stress due to shrinking of the forests on which they have traditionally depended. Not being traditional farmers, their land-holdings usually tend to be small micro-plots. The *wadi* model provides an effective solution to ensure their livelihood and nutritional security while also helping to regenerate the natural resource base.

This model also has the potential to benefit over 100 million small and marginal farmers across India. The opportunity is thus immense in terms of enhancing the food production of the country from the same amount of cultivated area. With the *wadi* intervention areas emerging as hubs of vegetable and fruit production, there is a further opportunity of linking these farmers to local and regional markets through value chain interventions and food processing based enterprises to achieve further economic gains for the farmers.



About NABARD

National Bank for Agriculture and Rural Development (NABARD) was established on 12 July 1982 by an Act of the Parliament to promote sustainable and equitable agriculture and rural prosperity through effective credit support, related services, institutional development and other innovative initiatives.

About Development Alternatives



Development Alternatives (DA), a not-for-profit action research and development organisation, innovates and disseminates sustainable solutions aimed at reducing poverty and regenerating natural ecosystems and services. Established in 1982, its ecosolutions deliver basic needs products through the small, local enterprises that generate green jobs and sustainable incomes. Based on its innovative environment-friendly technologies and market principles, these enterprises help build local economies and communities while maintaining a minimum ecological footprint.

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