



Climate Change Adaptation

Watershed Organisation Trust

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About WOTR

Watershed Organisation Trust (WOTR) is one of the premier NGOs tackling water scarcity, rural poverty, and food insecurity in the dry-lands of India today.

WOTR's specific objectives are to regenerate the natural ecosystem with a strong Participatory, People-centric approach that will simultaneously repair the torn social-fabric of community; to address the severe water-scarcity, recurring drought, low-agricultural productivity resulting in starvation, chronic hunger and severe mal-nutrition in the communities; create alternative, diversified livelihood opportunities that can bring the communities out of poverty; through partnerships between diverse groups: villages, NGOs, Government within India and across countries especially South-South Co-operation.

WOTR has specific competencies in Watershed Development and Natural Resource Management, Integrated Water Resources Management, Rural Development, Community Mobilization, Gender and Women's Empowerment, Systems

Development and Capacity Building.

In all, WOTR has carried out developmental work in over 2,500 villages in five states of Maharashtra, Andhra Pradesh, Madhya Pradesh, Rajasthan and Jharkhand. In its 18 years since inception, it has organized over 1,100 watershed development and climate change adaptation projects, covering over 680,000 hectares and impacting over 970,000 people. Its involvement in over 8,300 women's SHGs, micro-finance, trainings and other initiatives have benefitted over 100,000 women. Similarly, over 300,000 people from 27 states in India and 35 countries have participated in WOTR's Training and Capacity Building programs.

WOTR has also published a variety of Action Research Studies, films and other communication materials.

WOTR has 184 NGOs and government Project Implementing Agencies (PIAs), which are vital partners in WOTR's extensive development network.

Engine for Adaptive Sustainable Development



The outer circle, comprising of the five capitals, are the tangible frame within which human life unfolds. The five capitals – the physical, financial, social, human and natural – have to grow and develop simultaneously and harmoniously to have sustainable growth.

A set of five important conditions, essentially interconnected, that are necessary – material adequacy (not merely 'increase'), security (freedom from fear of insufficiency, discrimination and conflict), freedom of choice, healthy interpersonal relationships and good health. These result in an empowered community that lives in dignity and that enjoys well-being.

In the centre is WHOLENESS – a body, mind, spirit integration – a harmony rooted in centredness; the space within which the individual and the community are one with the universe.

When we work to conserve our Earth for the 7th generation, we will be conserving it for ourselves. It requires that we sense, understand and respect the interconnectedness of the various components of the engine and take the necessary steps (adapt) so as to strike the balance that will maintain the equilibrium. We would necessarily need to work together as a community and as a group of communities to achieve sustainability.

ACKNOWLEDGEMENTS: This image emerged within WOTR after years of deep reflection, while we were trying to find congruence in the way we need to go forward. The thoughts, ideas and mainly sensing of the various components of "The Engine for Adaptive Sustainable Development" comes from the contribution of many across the globe and across times. We thank each of you, some known, most unknown, for permitting us to take your thoughts and to weave it into a meaningful link as we look towards the future of our great, great grandchildren's children.



Climate Change Adaptation Project

In ecologically fragile and rain fed regions of India, land degradation, local climatic variations and frequent droughts together with unsustainable resource exploitation have led to severe depletion of land, water and biomass resources thus significantly reducing the availability of water, food, fodder, fuel for cooking and fibres for household consumption and economic production.

In India, the problem is further compounded by Climate Change. The coping mechanisms developed by farmers and all those communities who depend on nature for their livelihoods, are in danger of falling apart. Monsoon and temperature patterns are expected to become and are already becoming more and more erratic. This high unpredictability and variability has implications not just on the weather but also on water, food and agricultural production. The impact of climate change is expected to manifest through deficient and erratic monsoon, change in patterns of pest attacks that will lower agricultural production and productivity, drought and extreme events, triggering a spate of migrations.

The people in the eye of the climate variability storm are the already vulnerable local communities highly dependent on nature and rain.

This Climate Change Adaptation project, thus, seeks to develop the knowledge, strategies, approaches, measures and processes that enable vulnerable communities to cope with and adapt to these impending impacts and which are also widely adoptable, replicable and up-scalable.

This is being achieved through building capacities of vulnerable communities and institutions through watershed and ecosystems based approach. The emphasis is on innovative and people-centred strategies and action. Such innovative activities include downscaling of assessment of impact of climate change, weather based scientific advisories for enhancing agricultural production, biodiversity conservation, promotion of new financial instruments especially weather-linked insurance, carbon neutral communities and disaster risk reduction with effective governance mechanisms.



Key Innovations

Since ecosystems and communities are interlinked, WOTR has adopted a cluster based approach in which regenerated and sustainably managed ecosystems provide the bedrock onto which all other interventions are anchored.

Agriculture is the “staff of life” not only for agrarian communities but also for the rest of us. In order to increase the productivity and efficiency of the farmer, land and the water available amidst changing local weather conditions, WOTR, together with its knowledge partners, is developing integrated crop-water-nutrient-pest management schedules for specific crops. This is complemented by “Water Budgeting” exercises which help communities visualise likely scenarios if available water is used wastefully and inefficiently. An initiative to provide weather related crop advisories regularly is also underway. A Content Management System called “Agrimate” which aims to electronically archive crop related management practices and automate dissemination tailored to farmer needs is under development. Local Biodiversity mapping using a modified People's

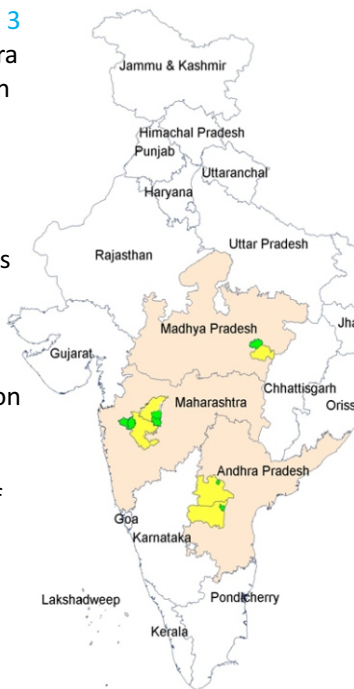
Biodiversity Register approach is being undertaken so as to identify, describe and conserve local seeds, flora and fauna with a view to building resilience of local communities and ecosystems to extreme climate events. Such resources can also become sources of alternative “green livelihoods” and sustenance especially in times when traditional sources fail.

Various community-centred and IT enabled tools to map vulnerability and its drivers, and identify mitigative and adaptive responses such as CASDAAT (Climate Adaptive Sustainable Development Assessment & Adjustment Tool) and LM3 (Local Money Multiplier) are also in the works.

Assisting us in this innovative but complex effort are specialised institutions of national and international repute such as the IMD, ICRAF, CRIDA and the MPKV. Besides knowledge and technology development, this collaborative engagement can also significantly contribute toward policy enablement in national adaptation programs and mainstreaming of best practices.

Project Area

This project is being implemented in 6 Clusters comprising 53 villages across 3 states of Maharashtra, Andhra Pradesh and Madhya Pradesh which together represent different agro-ecological and climatic zones; are culturally and ethnically different and also represent different levels of backwardness and integration with the wider economy. The project will engage with a total population of over 52,000 people from 9,800 households spread across a geographical area of around 33,252 ha (332 sq. kms).



Project Measures & Interventions

Since climate change adaptation is a green field area where little experience and validated field level successes exist, the approach being adopted is of a comprehensive and integrated nature with flexibility built into operations. WOTR is undertaking the following measures:

Promotion of Climate Change Adaptive Behavior and Disaster Risk Mitigation

- Building a resilient natural resource base through participatory, comprehensive and Integrated Watershed and Ecosystems Management.
- Integration of biodiversity conservation measures for climate change adaptation and mitigation.
- Building up of food security through promoting weather related Sustainable Agriculture that will optimize water efficiency and build Water Budgeting practices in Crop Planning and Management.
- Promotion of sustainable livelihoods including non-weather related eco-friendly ones.
- Gender, women's empowerment & engagement in adaptation and disaster preparedness.

Promotion of Mitigative Measures

- Alternate and Renewable Energy for household cooking and lighting.
- Green field/ Emerging Technologies/ energy efficiencies.

Capacity Building, Knowledge Generation, Dissemination and Policy Advocacy

- Training, Experience Sharing and Advisory Services.
- Action Research and Communications.
- Development of Tool Kits, Indicator Sets and Technology enabled Monitoring systems.
- The School of Sustainable Living and Livelihoods (SSLL).
- Policy Advocacy and Dialogue.

Watershed Development & Ecosystems Management

WOTR's concept of Watershed and Ecosystems Management in the context of Climate Change builds upon its extensive work and expertise in Watershed Development in organising communities to sustainably manage the ecosystems they live in, and bring about an optimal equilibrium between natural resources, people and living creatures.

It roots itself in ecosystems management as a means to reduce risks, mitigate the impact of extreme meteorological events, increase productivity, conserve biodiversity, improve the quality of life and stabilise and enhance nature based livelihoods.

In resource fragile areas, the demands and claims on the environment are enormous. Unless they are managed within the carrying capacity of the available natural and biotic resources, the local ecology and ecosystem will progressively deteriorate to a point where it can no longer provide even basic environmental services. A degraded ecosystem further pushes the communities living within it into poverty and deprivation, leading to migration. The Millennium Ecosystem Assessment of 2005 found that 15 of the 24 major ecosystems were either degraded or being used unsustainably.

WOTR's Watershed and Ecosystems Management approach attempts to build both "hard" as well "soft" resilience within communities against disasters of slow and sudden onset such as droughts, moisture stress, infrequent and highly



variable rainfall, intense precipitation, and pests and disease attacks. It is a multi-sectoral, multidisciplinary and multi stakeholder approach that involves continual interaction and dialogue between and amongst the various sectors and activities.





Adaptive Sustainable Agriculture

Along with the soil and water conservation programmes, promotion of agricultural techniques and practices is equally important in sustaining the livelihoods of the people in the long term. All too often, market considerations exert undue pressure on the agricultural practices, which in turn affect the production base and cause irreversible imbalances in the eco system.

WOTR has been extensively promoting sustainable agriculture practices as part of its adaptive sustainable development approach. The objective is to promote low external inputs, increase land productivity, indigenous seeds, and reduce cost of cultivation. This involves promotion of agricultural demonstration plots, vermi-compost pits, training farmers on better practices of transplantation, spacing, soil and manure preparation, tillage operations, seed treatment, sowing methods etc.

This is being effectively combined with agro-meteorology and water budgeting to make agriculture not only sustainable but also efficient and adaptive. Localized met-advisories and Agri-met advisories provide timely information to farmers so that they can plan their agricultural activities. Water budgeting exercises help farmers understand the water availability in the region. With this connected and combined information of impending weather conditions, water availability, appropriate agricultural techniques the farmers will be able to best plan the crops they would sow in the season, keeping in mind food security, nutrition security and market demands. The idea and purpose is to promote resilient, adaptive and sustainable agricultural practices and thinking that generate maximum output per drop of water.



Agro-Meteorology

WOTR's concept of Agro-meteorology uniquely combines locale-specific Met-advisories and Agro-advisories that provide timely information to farmers so that they can plan their agricultural activities accordingly. Automated Weather Stations are installed in the villages to provide daily Met-information which is collected and displayed in villages by local youth from the communities.

Agriculture is weather dependent at the local level. Yet, currently, farmers do not have access to reliable locally relevant meteorological and agricultural information by which to plan and manage their farming operations. Information presently available is based on inputs from weather stations that are located at taluka places and which are manually obtained. In the monsoon-driven weather system that is ours, local agro-meteorological conditions, especially rainfall, vary within even a kilometer; and such distantly located weather stations are not able to provide data that can generate locale-specific knowledge and advisories. In earlier days, before technology drove our lives, the elders of the village

planned their agriculture activities based on how they sensed the forthcoming weather and what they observed in the surrounding flora (plants and trees) and fauna (insects, birds and animals). Most of this indigenous knowledge however is now lost. It is thus important to retrieve, document, analyse, utilize and disseminate practices that are promising and useful.

The expected outcomes of the Agro-meteorology component of WOTR Climate Change Adaptation project are:

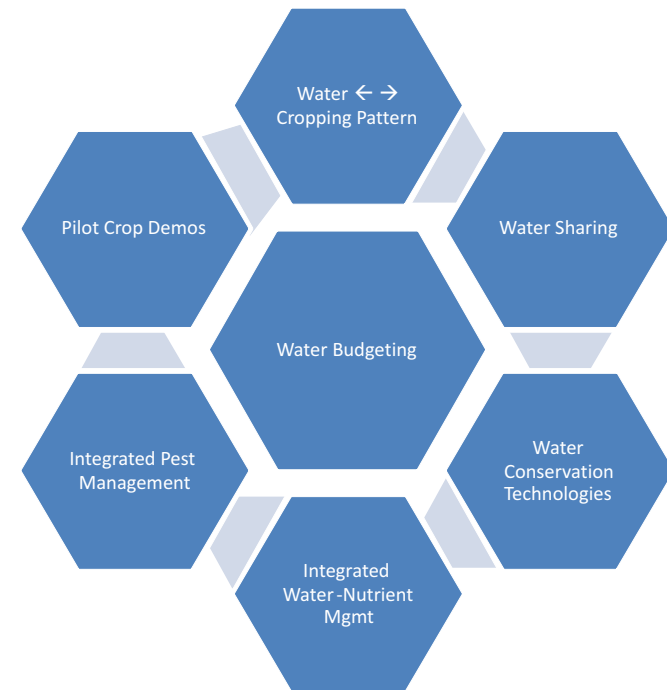
- Local weather data is available to the farmers.
- Local community understands and uses weather information for agriculture planning and management.
- Agro-advisories are provided based on local weather data.

Water Budgeting

WOTR's conceptualization of Water Budgeting is geared towards ensuring equitable, optimum and most efficient use of water. This involves gaining an understanding of water availability, community's existing needs and requirements of water, crop-planning based on water availability, optimizing irrigation, equitable sharing of excess water, and considered decisions on groundwater withdrawals.

The Water Budgeting approach and exercises help the village community understand the implications of the different patterns of water use that are prevalent. By obtaining village level water availability data (from the rainfall and that obtained from the well data), the people are able to assess the

water available at their disposal for the coming months, plan the judicious uses of water and decide on the crops accordingly, after taking into consideration the needs of households and livestock. This consideration of various local claims on water resources in the village provide a strong basis for making decisions regarding the different and appropriate cropping patterns, area to be taken for cultivation, the method of application of irrigation water, imposition of water use charges, if any, that arrives at not only equitable sharing of water but also optimizing output per drop of water.





Biodiversity & Ecosystem Services

WOTR's integration of Biodiversity concerns builds on the close bond between the local biodiversity, sustainable regeneration of ecosystems / watersheds and sustainable development of resilient communities.

Biodiversity plays a crucial but often underestimated role in the mitigation of climate change. Local communities significantly depend on locally available flora and fauna for food, water, energy, health and livelihoods especially during lean and stressed periods. A robust flora and fauna enables water conservation, percolation and storage, creation of biomass, nutrient storage and recycling. They also have a high capacity to absorb torrential rain, reduce its erosive impact, slow down surface run-off and support the seepage of rain water into the soil and lower rock beds.

Biodiversity, thus, plays a key role in sustaining local

communities, mitigating the impact of climate-induced disasters and protecting the natural processes and services provided by ecosystems. Since it gets easily affected by and in turn influences local agro-meteorological conditions, its conservation and protection has a significant role in contributing to mitigating the impacts of climate change and promoting adaptive responses.

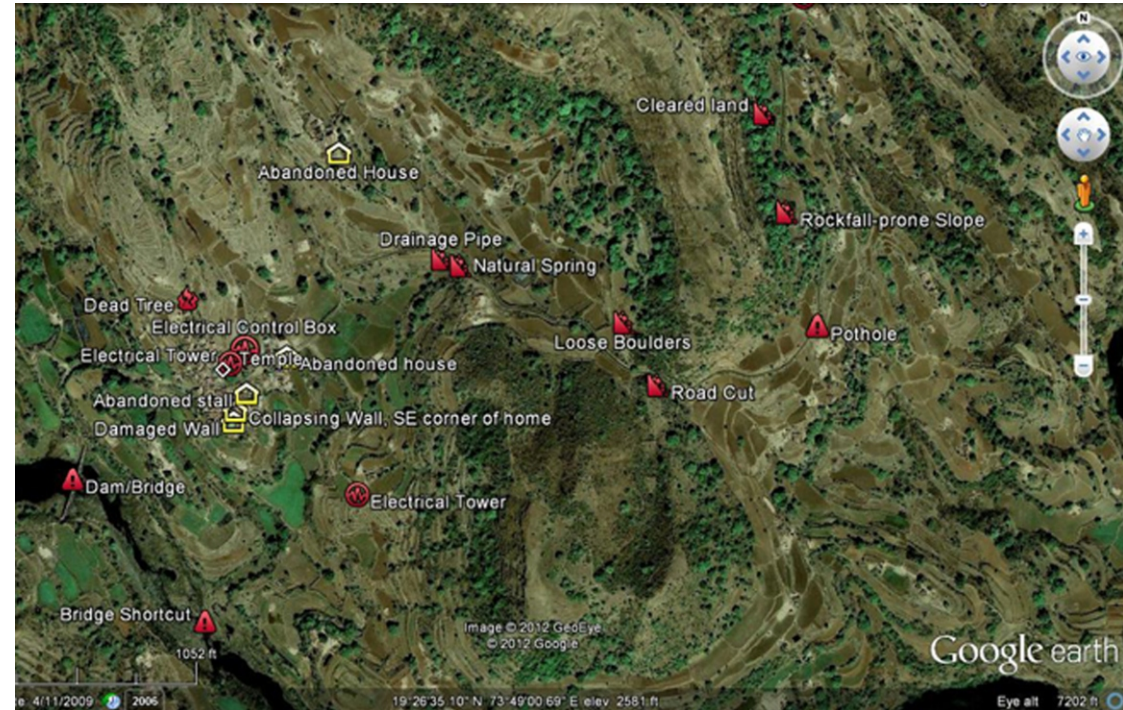
WOTR's Biodiversity approach involves creating an awareness in the community about the importance of promoting, conserving and protecting the local biodiversity, helping them keep a record of it through participatory mapping, sustainably promoting Biodiversity based livelihoods and economic activities capacitating them in conservation and protection of their local flora and fauna, and address likely adverse impacts of decisions taken by the local bodies.

Disaster Risk Reduction (DRR)

Increasing frequency and intensity of disasters in India, has highlighted the gravity of the problem and prompted greater emphasis on pre-disaster preparedness and mitigation as an integral part of Climate Change Adaptation. This entails a shift in focus away from conventional fire-fighting approach to disaster management towards anticipatory local-level initiatives involving a range of stakeholders.

WOTR's concept of DRR and CBDM (Community Based Disaster Management) is a cross cutting theme of the Climate Change Adaptation Project. Since every individual is vulnerable and is threatened by natural and man-made disasters, every individual is required to be aware and also have a minimum capacity to counter such crisis. This implies that the entire population of a settlement or a village community has to be involved in the event of a crisis which has the potential to affect all or a majority of them. Community based disaster management has to start through local groups in order to reach out to each family and neighbourhood; and local institutions have a crucial role in this process of mobilizing people in various situations and stages of evolving crisis. Community participation and community ownership in disaster risk reduction is a key factor in reducing vulnerabilities of people and minimizing losses.

WOTR's DRR and CBDM activities involve awareness campaigns and village sensitization to motivate the community in preparation of disaster management plans, review and analyze past disasters, create a seasonality calendar of disasters, map their resources and assets, risk and vulnerability areas and work out safe and alternate route maps, and setting up and training local bodies in basic and immediate disaster response.





Sustainable Livelihoods & Localization

WOTR's concept of Localization is rooted in the belief that a localized economy is more likely be able to adapt to Climate Change and will simultaneously contribute to reducing carbon emissions by having a smaller carbon footprint. The data from WOTR's study in some of the villages suggests that over 92% of the resources are drained out of the village, leaving very little to circulate within the villages, leaving the local economy very weak and vulnerable and at the edge of constant risk of external political and market forces. If communities are to be able to cope with and survive the climate crisis and are to be resilient to volatile market shocks, they need to create and find their growth opportunities within their own locales and develop skill-sets that address and satisfy the same.

Livelihoods in the current development paradigm have resulted in a systematic erosion of local skill-sets, while acquiring new ones that cater very little to local demands and needs, which in turn has

meant that these demands and needs are met by external expertise. This has spiralled the local populations further and further away from local self-sufficiency to external dependence that have also resulted in skews in the 5 capitals - natural, financial, social, human, physical - developing some to the detriment of others.

WOTR's livelihood approach attempts to address both these issues simultaneously by strengthening local demand-supply chains by diversifying livelihoods in a manner that keeps an optimum balance within the 5 capitals. The objective is to optimize entrepreneurial profits and not necessarily maximize profits. By continuously improving the 5 capitals and focusing on optimum profits, this approach helps reduce the leakages (outflow of money) in a sustainable manner, increasing the adaptive capacities and reducing the vulnerability of the communities.



Alternate Energy

Non-renewable energy resources are finite, and hence make the scarcity of fossil fuels a reality in the near future given the pace at which we are extracting these resources. India has a large percentage of impoverished population in rural areas whose energy demands are well below the global average, yet their energy needs (for cooking, drinking water and irrigation) are still largely unmet. Besides this, rural women spend a significant amount of their time and energy in gathering fuel-wood and feel the health impacts of indoor air pollution. Any efforts to improve efficiencies and introduce cleaner burning fuels, thus not only helps save lives but also considerably reduces the drudgery that women in rural areas face.

The focus of WOTR's Alternate Energy initiatives in the Climate Change Adaptation project caters to a number of needs: the need to reduce carbon emissions for

Climate Change Mitigation; the need to adapt to depleting non-renewable energy resources, thereby reducing vulnerability; to find ways to produce energy locally from clean, renewable sources thereby brightening the livelihood prospects, and improving health conditions of the local communities; and avoiding financial leakages by reducing dependency on external energy sources.

For this, Hot Water Chullahs, Solar Home Lighting systems, Solar Street Lights, Solar Parabolic Cookers, Biogas Plants, are being promoted widely. WOTR's own pioneering effort of greening its Darewadi Training Centre has resulted in a Solar-Wind Hybrid system that entirely generates its power needs self-sufficiently, is off-grid and has brought down energy consumption by 90%.

Partnerships & Collaborations

This project is being implemented by WOTR in partnership with the Swiss Development Cooperation (SDC), NABARD (National Bank for Rural Development) and other private donors.

IMPLEMENTATION MECHANISM, PARTNERS AND ALLIANCES

- This project is being implemented by WOTR in collaboration with its sister organisations, namely, Sampada Trust and Sanjeevani Institute for Empowerment and Development (SIED) and supported by the Embassy of Switzerland (Climate Change & Development Division), NABARD, SwissRe, Dr & Mrs. S.H.M. Modi Hormus House Benevolence Trust Fund, Integrated Watershed Management Programme (IWMP) in Andhra Pradesh, and Government of Maharashtra.
- We have formal collaborations with knowledge partners such as India Meteorological Department (IMD), Central Research Institute for Dryland Agriculture (CRIDA), International Centre For Research On Agriculture And Forestry (ICRAF), Mahatma Phule Krishi Vidyapeeth (MPKV).
- At the village level, people are organised into Village Development Committees (VDCs) which are inclusive, representative and nominated by the village community (Gram Sabha). The VDC will become a sub-committee of the Gram Panchayat. The VDCs in each Cluster are federated into a Cluster Development Committee (CDC) so that mutual learning takes place, experiences are shared and concerted action can be undertaken across fairly large areas.
- Women in the project villages will be organised into Self-Help Groups (SHGs) which will be federated at the village level into an Apex Joint Women's Committee Samyukta Mahila Samiti (SMS).

Funding Partners



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Embassy of Switzerland in India



Swiss Re



सत्यमेव जयते

Government of Maharashtra

Integrated Watershed
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Andhra Pradesh

Dr & Mrs. S.H.M.
Modi Hormus House
Benevolence Trust Fund

Knowledge Partners

WOTR is being partnered for technical inputs in some of the Climate Change Adaptation activities by the following:

India Meteorological
Department, IMD



International Centre For
Research On Agriculuture And
Forestry, ICRAF



Central Research Institute for
Dryland Agriculture, CRIDA



Mahatma Phule Krishi
Vidyapeeth, MPKV

