

ECOLOGIC

A WOTR Newsletter
July 2019

In focus: Sustainable Agriculture



Highlights

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power of a collective



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Sustainable agriculture – is the argument against going organic justified?

When I started reading about organic farming and its benefits, the choice of adopting these practices or continuing with 'conventional' ways seemed like a no-brainer. There were numerous reports about organic inputs leading to better productivity (10 ~ 30% improvement) and lower input costs, while also being environment and climate friendly. Additionally, there was a steady growth in demand for organic products, from niche urban markets as well as for exports, where buyers were ready to pay a premium for the 'healthier and tastier' produce. So why weren't more people adopting it? Why do agriculture experts and environmentally conscious organisations need to 'hard sell' this approach? The devil, like in most cases, lies in the details. And in the classic chicken-and-egg situation.

The real insights begin to emerge during longer conversations with the various stakeholders involved – farmers, big buyers in local markets, relevant people in the agriculture departments, popular organic brands and of course consumers – like you and me. The barriers to switch to organic farming are several. First, is the reality that organic farming isn't a simple one-size-fits-all solution and doesn't necessarily change the game overnight. Farmers must learn to manage soil nutrients without fertilizer and tackle weeds and pests without chemicals. Growing different crops in consecutive seasons helps to break up the pest and disease cycles; however this might not be in tune with market demands.

Then, is the issue of yield falling initially during the transition to 100% organic farming. According to an ICAR study, productivity dips by 6.7 per cent in the first year. Additional labour requirements and risks at several stages from cultivation to transportation and sales is also a reality. And finally, the transition comes with the burden of farmers not getting premium prices until organic certification is complete, which

requires a period of 3 years at least. There is a lot in terms of regulatory support and financial incentives needed to encourage the transition away from conventional practices.

A number of countries have carefully designed subsidies to compensate the initial losses during the conversion period, which India could learn from. Promoting organic clusters, smart transport and dedicated supply channels are urgently required as highlighted in a recent ICRIER study. Also, there could be proactive steps taken with regard to state procurement by having a separate MSP for organic certified products. While there are subsidies for fertilisers and pesticides, such support for organic inputs are amongst the most common demands of organic growers. Those that do receive some subsidies under the Participatory Guarantee System (PGS) provision of the Paramparagat Krishi Vikas Yojana (PKVY) scheme face restrictions on exports.

So in the absence of such regulatory support or other incentives and the risks involved, it is a wonder that small and marginal farmers across the country still feel motivated to go organic. There are incredible stories of change and success amidst very challenging conditions that you will find in this Ecologic issue. Whether such initiatives were encouraged and supported by organisations like WOTR, or picked up from observing their peers, these proactive efforts of small and marginal farmers are primarily down to the connection they instinctively feel with the soil, 'mother earth' and the ecosystem around. They can sense what isn't sustainable and are willing to change even while other aspects of supply-chain, markets, and government support sorts itself out. These farmers are not stuck in the chicken-and-egg problem and are brave pioneers of the agriculture sector's transition towards a more sustainable, climate resilient form.



Harnessing the power of a collective



In Ahmednagar Maharashtra, a local FPO enables farmers to access cheaper agri inputs, benefit from vermicomposting

Vikas Prakash Joshi & Geetanjali Prasad | Dhawalpuri, Maharashtra

The village of Dhawalpuri is located in the Parner taluka of Maharashtra's Ahmednagar district, about 30 km by road from the main Ahmednagar town. Its population is around 5,000 and the major occupation of the people in the village is agriculture. The main crops in the village are moong (green gram), bajra (pearl millet), soybean and jowar (sorghum) in kharif season; wheat, tomato and onion in the rabi season. The village residents largely depend on agriculture as their main occupation while there is also migration to the towns of Bhalawani, Ahmednagar and the city of Pune for seasonal employment as labour, especially in times of drought and crop failure.

The majority of farmers in Dhawalpuri belong to the small, marginal and medium categories. These farmers, like in many villages across the country, have traditionally lacked marketing options for their produce, barring the weekly bazaar in their village;

they also struggled to get cheaper inputs and had to travel to nearby towns to buy fertiliser, pesticides, seeds, irrigation equipment and so on. Both time and money were wasted in this process. Farmers in Dhawalpuri generally did not have much surplus to invest nor do they get the benefits of economies of scale as they lack bargaining power; thus leading to the farmers getting a fraction of the value that the consumer pays and not able to get cheaper inputs either.

It was to redress these perennial issues that WOTR helped set up the Ankur Farmer Producer Organisation (Ankur FPO) in Dhawalpuri on December 9, 2016. This was done with support from the National Bank for Agriculture and Rural Development (NABARD) and the German Agency for International Cooperation (GIZ), under the 'Soil Protection and rehabilitation for food security' project (Pro-Soil project).

Key aspects of the success – the vermi composting unit and agri-mall

Since its inception, the Ankur FPO has set up a vermicompost unit and an 'agri-mall', both of which are having a positive impact on the lives of farmers in Dhawalpuri and villages nearby.



A photo of the vermicompost unit in Dhawalpuri, Maharashtra.
Photo: WOTR

Project Manager Santosh Chaudhari tells us more about the 'success story' of the Ankur FPO. He says "The vermicompost unit was established in March 2017, after several months of creating awareness among farmers of the need for organic agriculture practices, while the Agri-mall was set up on June 29, 2018." Govind Kashnath Kute (55) is one such farmer who has benefitted, both from the vermicompost unit and the agri-mall. Govind owns 10 acres of land, of which he carries out agriculture on about 4-5 acres; the rest of his land is fallow. His main crops are wheat, chickpea in the rabi season and moong and onion in the kharif season. He says "When I compare the costs of vermicompost and chemical fertiliser, I can get a bag of vermicompost of 50 kg for around Rs. 400, while for chemical fertiliser it would have cost me at least Rs. 800 to 1000 per 50 kg bag. It also helps to improve soil health."

Santosh adds that 30 to 40 farmers in the village and around it have purchased vermicompost from the unit. He points out "For an acre of onion crop, a farmer may need 7 to 8 bags of fertilizer. In comparison, he may need 10 to 12 bags of vermicompost for onion but there is still a net saving."

Besides improving soil health, the Ankur FPO has also set up an 'agri-mall' that aims to satisfy all farmers' needs under one roof. The agri mall which is essentially a shop, has seeds, fertilizer, pesticides, medicines for tackling pests, pipes and drip irrigation equipment. The shop was set up on June 29, 2018. It has done sales of Rs. 26 lakh since then till December-end 2018 and 300-400 farmers have bought products from there, in that period.



Members of the Ankur Farmer Producer Organisation standing outside the 'agro mall' set up by the FPO in Dhawalpuri, Maharashtra.
Photo: WOTR

Query Somnath Palve, a farmer himself and a director on the Ankur FPO board, on what differentiates this store from others in Bhalawani or Ahmednagar, and he says "We offer on average a discount of around 6-7 % on all items here, relative to what stores in those towns offer. Besides, this price advantage, farmers save on time and money as they can buy their products here rather than travelling 30 km to Ahmednagar or 20 km to Bhalawani."

A few other farmers gathered at the store add that the personalised care and prescriptions from the Ankur FPO consultant is another big benefit as opposed to the generic products supplied by larger stores in the town.

(with inputs from Santosh Chaudhuri and Utkarsh Bhole, WOTR Parner Unit)

Organic inputs reduce costs considerably

Farmers in Mandla, Madhya Pradesh find that despite increased labour, organic inputs are attractive for sustainability in the long run

Geetanjali Prasad & Lalitkumar Nirmalkar | Banar, Madhya Pradesh



According to the Census 2011, there are 263 million people employed in the agricultural sector in our country, of which over 144 million are agricultural labourers. Agricultural labourers are generally those who either do not have land of their own, or whose land is of poor quality and hence cannot earn them a remunerative income. Dumari Singh, in the Banar village of Madhya Pradesh's Mandla district is one such labourer who had to regularly migrate for his livelihood.

Despite owning 2.5 acres of land, prior to 2012, Dumari Singh would earn barely Rs. 1,000 a month during the kharif (July-October) season, due to the poor quality of his soil. He would often migrate to Mandla district in MP or Raipur in Chhattisgarh or Dholpur in Rajasthan in search of agricultural labour work, where he earned slightly more, Rs. 2,000 – 3,000 per month, during the rest of the year. When the rains were bad, he often spent the entire year working outside.

In 2012, WOTR took up a watershed development project in Banar, after which

Dumari Singh could grow *kodokutki* (inferior millets), and later in 2016, he started growing *arhar* (pigeon peas) and *toor* (split peas). He was able to earn an average of Rs. 3,000 per month, in kharif and about Rs. 2,000 in rabi.

Despite this positive change, Dumari Singh notes that his earnings did not rise as much as he wished, mainly due to high expenditure on chemical fertilisers. Explaining the situation, he said "I had to travel three to 10 times to nearby Babalia market i.e. 20 km away from my village in Kharif season to buy chemical fertilisers. I was able to make an income of around 35,000 per year, but I had to spend 3,000- 4,000 rupees in kharif season and Rs. 5,000 - 6,000 rupees in rabi season, for buying urea and other chemical fertilisers."

In 2017, to address this issue of high dependency of farmers on chemical fertilisers, degraded soil quality and to improve the livelihoods in rainfed areas of Madhya Pradesh, WOTR initiated eco-friendly agricultural practices. These activities were supported by NABARD's Watershed



Dumari Singh pointing to his field post-intervention in Banar village of Mandla district, Madhya Pradesh.
Photo: Lalit Kumar Nirmalkar



Dashparni ark preparation by farmers.
Photo: WOTR

Development Fund (WDF) project. Training programmes were started by WOTR on organic farming and vermicomposting in 3 villages of Mandla district namely: Banar, Barbati and Gadadeori. Dumari Singh was one of the farmers who attended the training, which made him aware of organic farming.

In this context, Lalit Kumar Nirmalkar, the WDF project manager at WOTR's MP Regional Resource Centre shares, "In Banar, we gave a demonstration which eight of the 12 village development committee members attended. There was a common fear observed among the farmers about the reduction in yield. They all felt that nobody would compensate them when their yields reduced, after switching to organic practices. But we patiently explained to them that though their incomes may reduce a little in the beginning, their input costs would also go down and quality and productivity would improve". With time Lalit adds that to battle this skepticism and fear about using organic inputs, they would start with a demonstration on small 30mx30m size plots. It was only after seeing the success on such a 'demo-plot' that Dumari Singh eventually shifted over to using organic inputs like vermi-compost and dashparni ark (an organic pest and insect repellent) in 2017.

Dumari Singh expresses his appreciation at the benefit it has brought to him, saying he had never imagined that he would be able to grow food on his land due to its bad soil quality. He says "Now I am able to grow paddy, *kodokutki* and *arhar* (pigeon pea), maize and *til* (sesame seeds) in my own plot. My input cost has also reduced a lot by using home-made manure like vermicompost. My per-year input cost of fertiliser has reduced by about 50% over a single season by using vermicompost and other organic manure. One however has to be prepared for a lot of additional labour and preferably have access to manure from livestock in order to consistently use organic inputs", he concludes.

Soil health gets a fillip

Village in Jalna district, Maharashtra aims at long term sustainability by minimising use of chemicals

Harshal Khade & Geetanjali Prasad | Thigalkheda | Maharashtra



In the context of land degradation and dropping productivity due to poor soil health, WOTR is currently implementing a project aimed at soil conservation and improving soil health in Thigalkheda and seven other villages of Bhokardan block, Jalna district, Maharashtra.

This project 'Soil Protection and rehabilitation for food security in India' aims to educate and encourage farmers to adopt healthy agricultural practices and rejuvenate soil. It is supported by GIZ and NABARD and started in December 2015.

The main crops grown in the village of Thigalkheda are soybean, cotton (kharif), wheat and chickpea (rabi) while maize in both seasons. Prior to the project, farmers were applying chemical fertilisers and pesticides quite indiscriminately based on suggestions from traders and agents selling these inputs.

Kakasaheb Wadekar, Social Officer, WOTR who has been associated with the project since inception, talks about the challenges

faced while implementation of the project. He said that the challenge faced by the team was to introduce farmers to different agricultural methods. He says "We started talking to the influential people in the village, including the Sarpanch of the village. Once the sarpanch was convinced about the merit of the project, he called farmers where WOTR team explained them how it would benefit them."

In the beginning, 10 farmers were selected by WOTR team and the range of activities under the project were explained to them. Then, these 10 farmers were asked to follow the practices suggested by experts from WOTR in just half an acre of their plots. Exposure visits to Kisan Krushi Pradarshan (an Agri Trade show) in Pune and the Jain Irrigation facilities in Jalgaon were arranged to help them to know more about organic farming and other improved agriculture technologies. Vermibeds were provided to these farmers, which involved a monetary contribution from farmers.



Dhaneshwar Dhawale inspecting his vermibed, in Thigalkheda village, Jalna district.
Photo: Kakasaheb Wadekar

The application of vermicompost for the soybean plot of these 10 farmers resulted in quality enhancement with dark green colour of the leaves, which indicates healthy growth of crop. This made other farmers curious and they started to believe that the project would help them.

These same 10 farmers were provided with soil health cards in 2016, after testing their soil samples. The key benefit of the soil health card was to know the current status of soil health with the corresponding recommendation to address deficiency of nutrients (if any).

What is a soil health card?

A Soil Health Card (SHC) is a printed report that a farmer is handed over for each of his holdings. It contains the status of his soil with respect to Nitrogen, Phosphorus, Potassium (Macro-nutrients); Sulphur (Secondary-nutrient); Micro-nutrients (Iron and Zinc); pH, Electrical Conductivity and Organic Carbon. SHC also indicate fertilizer and integrated nutrient management recommendations and other measures required according to different parameters.

The importance of the soil health card lies in the fact that it gives an idea about the current soil condition and the appropriate remedial measures to improve it. These measures are soil as well as crop specific. These diligently followed measures are resulting in balanced nutrients in the soil conducive to better growth of crop and in turn improved agriculture productivity.



Dhaneshwar Dhawale holding his soil health card, in the village of Thigalkheda, Jalna district. Photo: Kakasaheb Wadekar.

Dnaneshwar Dhawale, is one of the beneficiary farmers. His total land area is 5 acres. His main crops are wheat and chickpea (rabi) and pearl millet and soybean (kharif). He says, "In 2016, soil testing was done by WOTR on soil samples from my land. I received a soil card with the primary nutrients in the soil i.e. Nitrogen (N), Phosphorous (P) and Potassium (K) and other nutrients such a Sulphur (S) and Iron (Fe) with organic carbon and pH. WOTR's Agricultural experts advised me to apply vermicompost as my soil had low organic carbon. Vermicompost improves organic carbon in the soil. I have got a vermicompost bed by contributing Rs. 500, as the rest of the amount was borne by the project."

He adds that the cost for fertiliser per acre of cotton crop had been reduced by Rs. 10,000, from an earlier cost of 35-40,000 rupees, and that this is a more economical and environment friendly option

Various activities such as soil testing, crop demonstration, System of Crop Intensification (SCI) demonstration were also implemented to promote use of organic manure and organic formulations like jeevamrut, dashparni ark etc. to maintain the soil health and increase the productivity.

After witnessing the benefits of these soil health cards and other allied activities of the project, like demonstrations and Farmer Field Schools (FFS), there is a lot more interest to participate in the project from other villagers.

Bird perches, a nature friendly pest control method

Nature friendly, integrated pest management practices gains ground in Rajur, Maharashtra

Vikas Prakash Joshi & Geetanjali Prasad | Rajur, Maharashtra

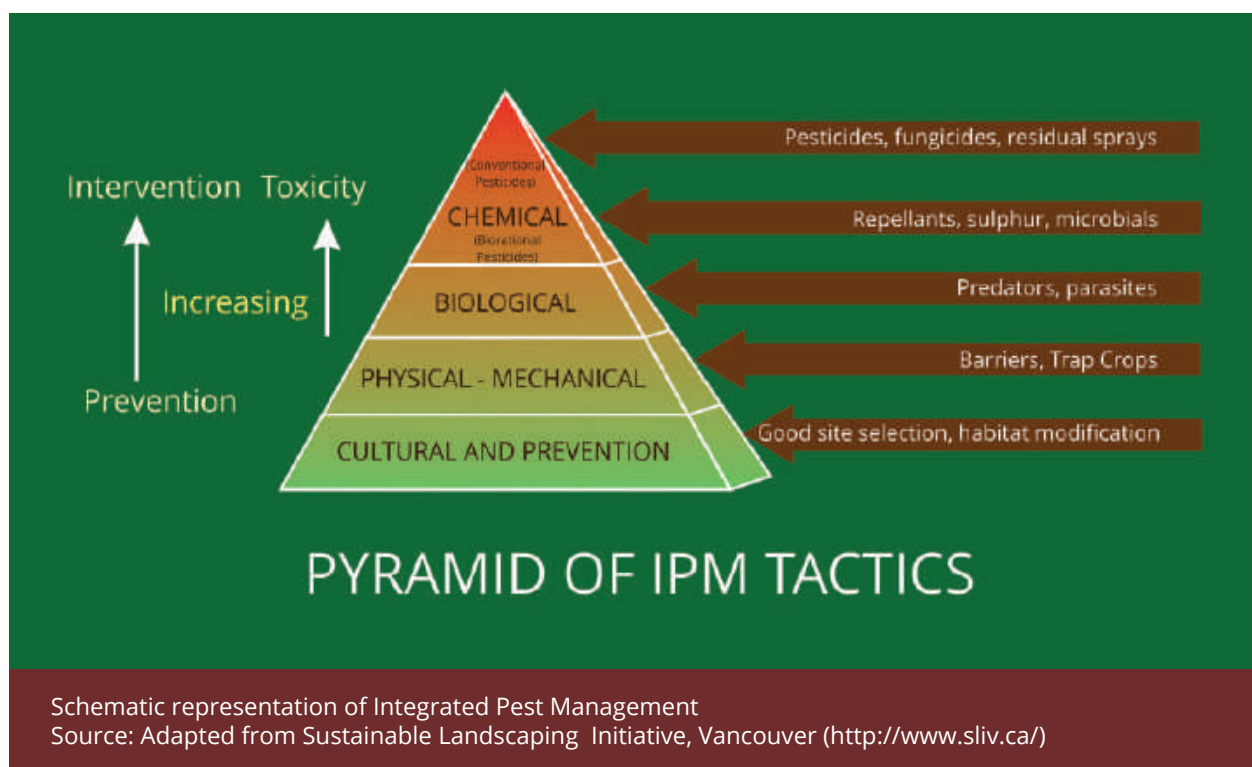


Many farmers have experienced the disappointment of carefully raising a crop only to have it damaged or destroyed by an invasion of pests. The practice generally carried out by farmers in such situations is to spray crops heavily with pesticides. This results in significantly higher input costs for farmers, not to mention health and environment hazards. Thus, there is a need for more environmentally friendly pest control methods. One such system is the Integrated Pest Management (IPM), which is an eco-friendly approach that aims at keeping pest population at manageable levels, with minimal use of pesticides. Instead, it employs a combination of alternate pest control methods and techniques with emphasis on use of bio-pesticides and pesticides of plant-origin like Neem formulations.

One village that is seeing this kind of transition to the use of nature friendly bird perches is the Chincholi village of Jalna district, Maharashtra.

Agriculture is a mainstay of the village and cotton is the main cash crop. Gajanan Hiwale, a farmer from the village owns four acres of land on which he grows soybean, cotton and chickpea. The story of Gajanan focusses on the issue of farmers' distress due to the exorbitant price of chemical pesticides'.

Prior to WOTR's intervention, Gajanan grew soybean, cotton and maize on his field, but his crops suffered much due to the attacks of leaf-eating caterpillar and girdle beetle on soybean, sucking pests on cotton, white grub on maize and pod borer on chickpea. He says, "I used to spend around Rs. 9-10,000 on chemical pesticides for my 1.5 acre chickpea plot. To buy pesticides, I had to go to Rajur market i.e. 10 km away from my village. I have also heard about the health issues due to these chemical pesticides which made me even more apprehensive, but I was not aware of what I could do."





Gajanan Hiwale showing his field with chickpea (main crop) and sorghum (bird perches) in the Chincholi village of Jalna district, Maharashtra
Photo: Narendra Tiwatne

To address this issue, in 2015 WOTR, with support from GIZ, started the Pro-Soil project in Rajur cluster. It was found that farmers were using chemical pesticides to an excessive degree. It was leading to deterioration in the soil health. For the next few seasons, WOTR gave a number of demonstrations and training sessions on the use and benefits of intercropping of bird perches in 10 to 12 'demo plots' of farmers in every village. But, the project was not just limited to the use of bird perches. The use of biocontrol agents, bio-pesticides and integrated pest-disease management techniques were also taught in farm field schools (FFS). In 2017, WOTR started a second phase of the same project, the Pro-Soil+ Project.

Gajanan, had attended the FFS of WOTR in 2016 and after learning about the bird perches, he grew sorghum (bird perches) with chickpea (main crop) in his field. He says "Earlier, I use to spray chemical pesticides three times a year; but now I just spray it two times or sometimes less than that also, rest of the pests are taken care by sorghum (bird perches) grown in my field. The birds who come to eat the Sorghum, also end up eating the pod borer pests, thus controlling their spread. I feel that WOTR gave me an apt solution for my pest problem because, my annual expenditure has reduced by about 30% for my chickpea crop since I started using the bird perches".

In Jalna district, the problems of pod borer and army worm infestation are severe, and hence both organic practices and bird perches farming are needed to reduce the frequency of chemical spraying.

For the WOTR staff, changing the mindset of the people was a really difficult task as the farmers depend heavily on pesticides. But when farmers saw the benefits of using bird perches with their own eyes, they themselves started taking it up. Currently, over 40 farmers in Chincholi village are practicing integrated pest management.

Weather based crop advisories for climate resilience

Crop management advisories through mobile phones yield positive results for groundnut farmers in Kurnool, Andhra Pradesh

Dr. AVR Kesava Rao and Dr. Sreenath Dixit | Patancheru, Telangana



Global warming is likely to reach 1.5°C between 2030 and 2052, if it continues to increase at the current rate, as per the report released in October 2018 by the Intergovernmental Panel on Climate Change. Climate related risks for natural and human systems are higher for global warming of 1.5°C than at present. Global atmospheric concentration of CO₂ has increased from preindustrial level of 280 parts per million (ppm) to 409 ppm in December 2018. Studies show that climate change in India is real and it is one of the major challenges faced by Indian agriculture, more so in the semi-arid tropics (SAT) of the country. ICRISAT under the National Initiative on Climate Resilient Agriculture (NICRA) project, quantified the changes in areas under different climates in India and their study indicated increase in the semi-arid areas in the country.

Devanakonda mandal in Kurnool district, Andhra Pradesh receives about 548 mm of annual rainfall in around 34 rainy days and falls under the hot dry semi-arid type of

climate; rainfed groundnut is the major crop of Devanakonda. Red soils are predominant and length of the rainfed crop-growing period is about 100-130 days. Most of the farmers are small and marginal farmers with low land holding and with increasing variability in the rainfall distribution, they are facing high risks for establishing the crops. Sowing at the right time as such is very critical to ensure that farmers harvest a good crop. And if it fails, it results in loss as a lot of costs are incurred for seeds, as well as the fertiliser applications. Farmers having access to climate and weather information are more likely to sow at the optimum time and take better crop management actions for achieving higher yields. ICRISAT and Microsoft have jointly taken up a pilot under the Andhra Pradesh government's "Rythu Kosam" Project for disseminating sowing and other crop-management advisories to rainfed groundnut farmers of Devanakonda based on near real-time observed rainfall and forecasted rainfall for the next five days.



Groundnut farmers attending a farmers group meeting on the benefits of the ICRISAT crop advisories in Kurnool, Andhra Pradesh.
Photo: ICRISAT

Soil samples were collected following the farmer-participatory randomised soil sampling methodology. Soil nutrient analysis indicated that soils are deficient in zinc (83%), sulfur (68%), boron (59%), and calcium (50%). Soil health card containing information on the current status of soil health and fertilizer recommendations for various crops in different seasons were prepared and provided to the farmers. Dual-purpose raingauges were installed and farmers were given training on rainfall measurement, data recording, displaying and sharing of rainfall data. A team from ICRISAT and Microsoft have visited Devanakonda and nearby five villages (Bhiravanikonda, Kukatikonda, K. Venkatapuram, Nelathalamarri and Singapuram) in Devanakonda Mandal and Farmers' Group Meetings were organized in the villages and farmers were informed about the proposed sowing advisory dissemination activity. Farmers were very enthusiastic and about 175 farmers registered their mobile phone numbers for receiving the sowing advisories without any cost.

Historic climate data for 30-years (1986-2015) were used to understand the rainfed growing season characteristics and optimum sowing window was identified using PNUTGRO crop-growth simulation model. In collaboration with ICRISAT, Microsoft has developed a water balance based AI-Sowing App powered by Microsoft Cortana Intelligence Suite including Machine Learning and Power BI. Beginning of groundnut crop growing period for the year 2016 was identified based on the present Moisture Availability Index computed from the daily rainfall recorded and rainfall forecasted for Devanakonda area for the next five days.

Advisories were prepared both in Telugu (local language) and in English and were disseminated to the registered farmers as SMS during the groundnut crop-growing period of 2016. Advisories included recommendations on land preparation, FYM and soil-test based fertilizer application, seed treatment, sowing, optimum sowing depth, preventive weed management, maintaining proper plant density, observing Boron and Zinc deficiency in field and applying nutrients if needed, harvesting, shade drying of harvested pods and storage.

In 2016, some farmers took up sowing in the first week of June itself. But, registered farmers, based on the advice received, sowed groundnut in the last week of June and first week of July 2016. During the 31-day period starting from 10 August 2016, Devanakonda received meagre rainfall of about 8 mm and the groundnut crop sown in the first week of June was badly affected by lack of soil moisture. Early sown crop dried up in many fields and rains received later did not



Farmers accessing advisories
Photo: ICRISAT



Young woman farmer measuring rainfall
Photo: ICRISAT

improve the situation. On the other hand, crops sown during last week of June and first week of July were able to recover from the moisture stress after receiving rains from 11 September onwards. Weather advisories brought climate awareness among groundnut farmers and encouraged them to initiate sowing at the optimum time. Registered farmers followed weather-based agro advisories for proper crop management and obtained better yields and not the losses that suffered by farmers who have sown earlier. Crop cutting experiments conducted at selected farmers' plots indicated

that registered farmers who have sown as per the advisory have obtained 30% increase in yields compared to some of the non-registered farmers, who had sown in the first week of June 2016. This activity was taken up under the Andhra Pradesh Primary Sector Mission

(Rythu Kosam Project) along with the state government, ICRISAT, Microsoft India (R&D) Pvt. Ltd and Chaitanya Youth Association were partners.

G. Chinnavenkateswarlu, a farmer with three acres (1.21 ha) said, "I sowed groundnut on 25 June based on the sowing recommendations provided. My crops were harvested on 28 October and the yield was about 1.35 tons per hectare. Advisories provided for land preparation, sowing, and need based plant protection proved to be very useful to me."

In the year 2017, sowing and other management advisories for crops like rice, maize, finger millet, groundnut, cowpea and cotton were disseminated to about 3,000 farmers in Andhra Pradesh and Karnataka and results indicated an overall increase in the yield of between 10% and 30%. Such initiatives highlight the need for strengthening extension services through AI-powered agriculture initiatives for helping rainfed farmers in semi-arid parts of India for better crop management.

The authors acknowledge the support received from all the partners and particularly the farmers who are now showing interest in climate smart agriculture options and to register their mobile phone numbers for receiving weather-based sowing and crop management advisories.

Author Profiles

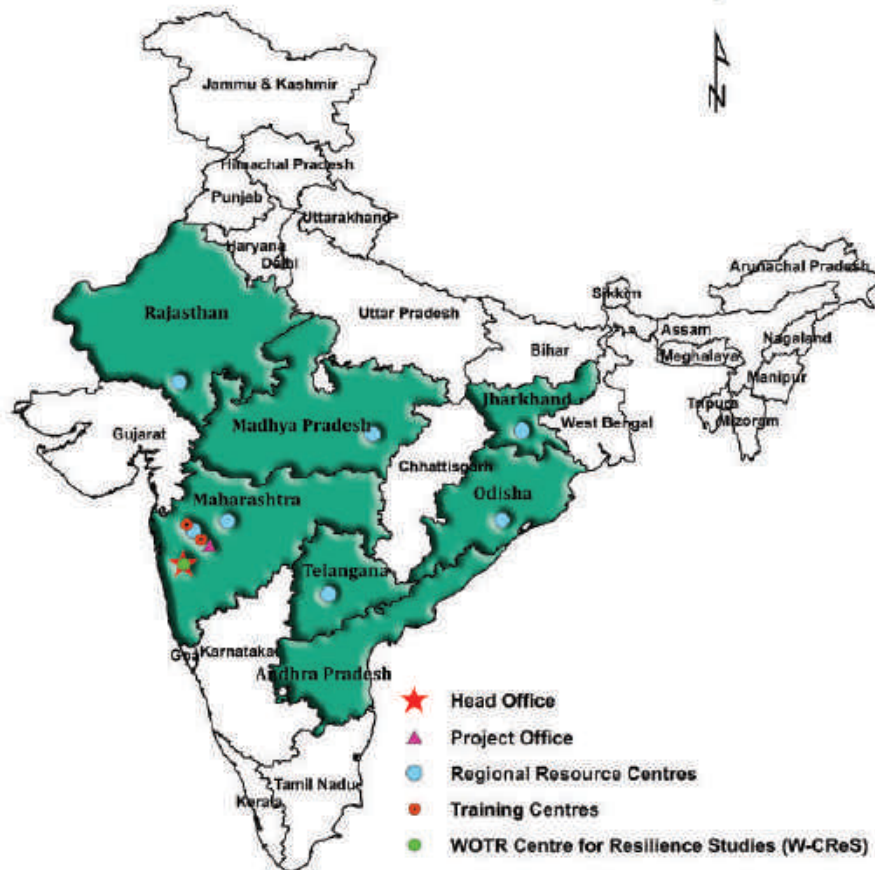
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WOTR's Areas of Operation



Watershed Organisation Trust (WOTR) is a globally recognized organisation dedicated to transforming the lives of millions across India through participatory watershed development and ecosystems restoration, adaptive sustainable agriculture, integrated and efficient water management and climate change adaptation, with a special emphasis on building the resilience of vulnerable communities, farmers and women. It was established in 1993 and is headquartered in Pune, Maharashtra India. WOTR's mandate is to reduce poverty through community mobilization for sustainable watershed development and integrated rural development. At present, it carries out rural development works in 4,827 villages in 7 states of the country, directly and indirectly benefiting 3.7 million people.



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