



# Ecosystem Development for Organic Farming

# Content

|   |                          |           |
|---|--------------------------|-----------|
|   | <b>Executive Summary</b> |           |
| 1 | <b>Introduction</b>      | <b>4</b>  |
| 2 | <b>Promotion</b>         | <b>6</b>  |
| 3 | <b>Processing</b>        | <b>8</b>  |
| 4 | <b>Ecosystem</b>         | <b>10</b> |
| 5 | <b>Impact</b>            | <b>13</b> |
| 6 | <b>Success</b>           | <b>16</b> |
| 7 | <b>Conclusion</b>        | <b>19</b> |



# Executive Summary

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**M**ore than a decade ago, when SwitchON started working in Nadia, they faced two systematic issues - inadequate knowledge of organic production practices and absence of markets and marketing channels to sell organic produce. Due to this gap of right farming practices and markets, there were challenges in its acceptance and uptake.

To enhance knowledge and practice, a series of interventions were planned with farmers. They were trained on sustainable practices and organic agriculture through several workshops and awareness sessions. By facilitating training on the preparation of organic fertilizers, pesticides, use of sustainable irrigation and harvesting procedures made the farmers self-sufficient and created a zero-waste farm production model ensuring reduced input costs and recyclability of farm waste. In order to address the market gap, SwitchON collaborated with National Bank for Agriculture and Rural Development (NABARD) to establish ONFarm Fresh Innovation Producer Limited in 2016 in Nadia district. ONganic directly buys from farmers, eliminating their cost on post-harvest processing and transportation besides offering them higher rates than market price. SwitchON has helped over 350 farmers by linking them to various government schemes and facilitated seed procurement licence from the State Seed Certification

Department. The creation of a particular supportive ecosystem like this has provided a boost in confidence for adoption and uptake of organic farming besides improved agricultural practices, healthier soil and high value yield that has enhanced farmer's income.

Organic farming has promoted self sufficiency as 90% farmers now make their own organic inputs, reducing their total input cost for farmers by 50-70%. SwitchON has conceptualised, initiated and incubated ONganic Foods to ease out marketing of organic products, providing post harvest processing and premium prices of organic products. Contract farming of organic crops has removed the transport (almost 10% of the total costs) and processing & storage costs (20-30% of the total cost) completely. Farmers have reported 10-25% increase in income by shift to organic agriculture.

There has been significant socio-economic upliftment with income enhancement leading to improved infrastructure, enhanced rural mobility, farm mechanisation and overall betterment of quality of life. Organic farming has improved soil health, water availability and overall growing condition of the crops. The sustainable ecosystem developed by SwitchON ensures a long term improvement of farmers as well as mitigates environmental effects of chemical farming.



# 1 Introduction

## What is Organic Farming?

**F**ood productivity and quality define the agricultural scenario of any nation. Conventionally grown foods have adverse health and environmental effects due to the high pesticide residues, chemical fertilizer residues in farm soil, antibiotic residues and use of genetically modified organisms. Moreover, conventionally grown foods contain lesser protective antioxidants. Thus, the demand for organically grown foods has increased in the last few years.

Organic food production is cultivation without the application of chemical or synthetic fertilizers and pesticides or genetically modified organisms, growth hormones and antibiotics. With environmental and health benefits, organic farming also aids in improving the socio-economic condition of farmers. India is bestowed with indigenous farming ingredients and techniques, and these are rapidly being adopted and practised to promote sustainable organic agriculture.

Conventionally  
grown foods have



Adverse Health Effect



Environmental Effects

Organic Farming

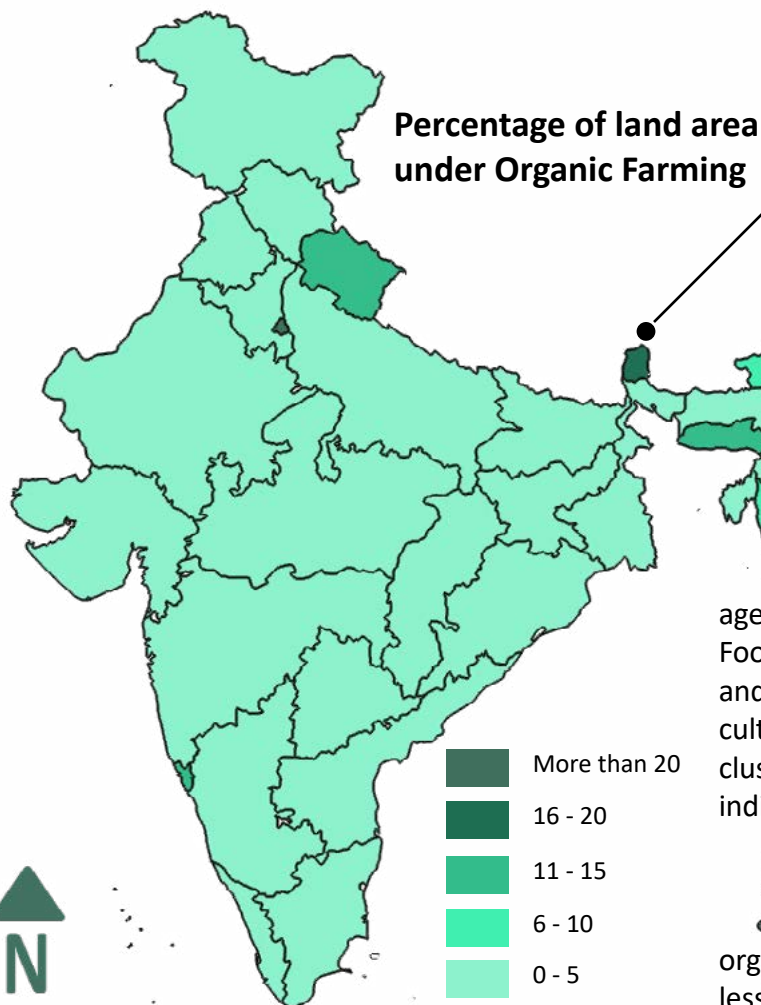
NO  
Synthetic  
Fertilizers

NO  
Pesticides

NO  
GMO



# Status of Organic Farming in India and West Bengal



Sikkim has 100% of sown land area under Organic Farming

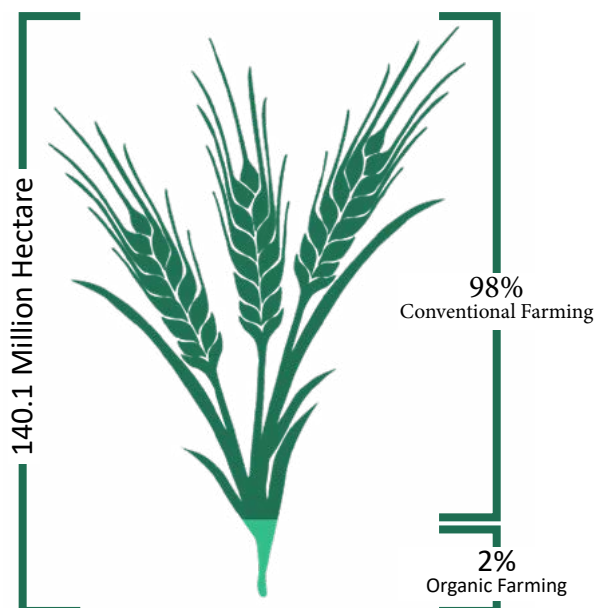
accounting for about half the area under organic cultivation. So far, Sikkim is the only Indian state to have become fully organic.

By 2019, West Bengal had 9000 hectares under organic production, accounting for 0.2% of the net sown area of the state. The state does not have any state organic certification agencies accredited by Agricultural and Processed Food Products Export Development Authority (APEDA), and neither has any state schemes promoting organic cultivation. However, there are small organic farming clusters coming up across the state, particularly growing indigenous varieties of cereals, pulses and vegetables.

The market for organic produce is significantly increasing with more and more awareness of health benefits and market price. Farmers adopting organic practices have observed better soil health, lesser water requirements and saving of input costs.

According to the Union Ministry of Agriculture and Farmers' Welfare annual report 2019-20, organic farming is rapidly growing in India with about 2.78 million hectare of organic farmland as of March 2020. This accounts for 2% of the 140.1 million hectare net sown area in India. Madhya Pradesh, Rajasthan and Maharashtra are leading in organic farming coverage,

**Organic Farming accounts for 2% of the 140.1 million hectare net sown area in India.**



# 2 Promotion

of Organic Farming by SwitchON



## Organic Production in Nadia

SwitchON has been working in rural West Bengal since 2008 in promoting sustainable livelihood for small and marginal farmers. While working with small and marginal farmers in Nadia district, SwitchON came in contact with farmers producing various crops organically over large areas.

These farmers faced two **major challenges**

Lack of knowledge on organic farming processes, especially pertaining to the inputs and crop maintenance.

Lack of proper markets and marketing channels for the farmers to sell the organic produce.

In order to solve the issues, SwitchON started providing small training sessions to the farmers on organic farming practices, including how to make organic input products at home and use them in their field. This helped farmers in improving their production process, but the fragmented production made the marketing costly and inefficient for small and marginal farmers. The marketing challenge was resolved by the collectivisation of farmers into a Farmer Producer Organization (FPO) and creating market linkage with ONganic Food Pvt.Ltd., who procure organic produce directly from farmers and process and market them at optimum prices.

# ONFarm Fresh Innovation Producer Limited

**S**witchON Foundation formed ONFarm Fresh Innovation Producer Limited under National Bank for Agriculture and Rural Development (NABARD) in Hanskhali block of Nadia district. The FPO was registered under the Companies Act on 1st August 2016 with 415 shareholders and ₹2,00,000 shareholding money as per equity grant.



Farmers from 14 villages in Hanskhali block came together to form ONFarm. The member base of the FPO has been increasing, and so is the quantum of production and services. The members of the FPO have an average landholding of 2.64 acres, and cumulatively own over 700 acres of land in the region.



Collectivise small and marginal farmers into an effective business entity.



Increase farmer's income through organic farming.



Adapt new and advanced farming technologies.



Develop marketing strategy and channel for the FPO products.

**Objectives**  
of FPO's  
formation

## By establishment of the FPO, SwitchON has provided

- Unified platform of collectivised farmers, creating a business entity
- Scheme linkages for financial assistance in farm mechanisation, input materials and processing
- Promote organic farming practices, by training and capacity building exercises on production input materials and market driven production models.
- Technical training on farm mechanisation, processing and advanced agricultural technologies
- Market linkages and supply chain facilitation for organic production

| PRODUCT                | PROCESSED PRODUCT           |
|------------------------|-----------------------------|
| Black and red rice     | Puffed rice, Flattened rice |
| Gobindobhog rice       | Puffed rice, Flattened rice |
| Black and White Sesame | Sesame oil                  |
| Black Cumin (Nigella)  | Seeds (used as spice)       |
| Black Mustard          | Mustard oil                 |
| Pulses                 | Split lentils               |





# 3 Processing

## Organic Farming Practices & Processing at ONFarm

**O**rganic Farming involves a complete set of different organically produced inputs, as well as natural methods of crop management. SwitchON has promoted best practices in organic farming since the inception of ONFarm. The sustainability of organic farming depends largely upon the self-reliant model of organic input management and product processing, and ONFarm has been actively working to achieve the same.



### Organic Seed Procurement

The success of any organic production depends on inputs and crop management. Organic value chain for indigenous paddy and rice has been promoted by SwitchON right from the beginning of ONFarm. SwitchON facilitated the establishment of a community managed seed production and marketing initiative by facilitating seed procurement licence from the State Seed Certification Department for the FPO. This has helped in addressing the issue of organic and indigenous seed availability and at the same time, access to good quality seeds for farmers.



used as bio-fertilizers. Soil treatment of crops with Azotobacter and Azospirillum increases yield by 10-15% and 10-20% respectively.

ONFarm members produce their own bio-fertilizers like Azolla, water hyacinth and others in local water bodies as procurement of the same is difficult for small and marginal farmers. These bio-fertilizers grow rapidly and are harvested regularly to be used for rice, pulses and mustard production. They are dried and stored in pits and used during fertilization. This significantly reduces input costs, as well as provides a constantly regenerating source for farm application.

### Bio Fertilizer Production

Bio-fertilizer production training and marketing facilitation was provided by SwitchON for ONFarm FPO members to stress on their utility for increasing yields. Biofertilizers are extremely essential for organic production of crops as they provide nutrients to crops through biological processes. Rhizobium strains and legumes like pulses, groundnut, soybean and others are known to increase yield by 10-35% when

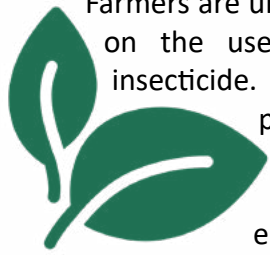


### Vermicompost and Farm-Yard Manure Production

Vermicompost and farmyard manure (FYM) are essential inputs for the organic farming process. Locally available earthworms as well as redworms and African earthworms are primarily used in the production process. ONFarm members participated in vermicompost and FYM production training facilitated by SwitchON. This has enabled them to start production on their own fields.



## Organic Growth Promoters - Production and Promotion



Farmers are unaware or have limited knowledge on the use of pesticides, fungicides, and insecticide. This leads to local fertilizer and pesticide businessmen exploit them, which is harmful for the farmer's pocket and the environment. To address this gap, SwitchON organised expert training sessions for FPO members with the primary objective to make them self-sufficient in organic inputs and understanding soil's requirements.

In the financial year 2019-2020, ONganic has procured the following major produces from ONFarm:

| Particulars              | Quantity Procured (in kg) |
|--------------------------|---------------------------|
| Aush Meghi Paddy         | 8,474                     |
| Basmati Paddy            | 1,205                     |
| Gobindobhog Paddy        | 13,119                    |
| Red Dudheshwar Paddy     | 7,119                     |
| Dudheshwar Paddy         | 9,727                     |
| Chingrihuli Paddy        | 10,415.5                  |
| Salkely (Red Rice) Paddy | 1,446                     |
| Black Rice Paddy         | 20,499                    |
| Sweet Corn Plant         | 1,21,820                  |
| Black Mustard Seeds      | 190                       |
| Black Sesame Seeds       | 307.5                     |
| White Sesame Seeds       | 17,619.000                |

## Market Linkages and Processing



The FPO follows contract farming with ONganic Foods Pvt. Ltd. to produce and market the FPO products. For post-harvest rice processing, ONganic has established a processing and packaging unit which threshes, sorts and packs black and red rice and aromatic rice (gobindobhog) and produces ready-to-eat puffed rice and flattened rice from the same.

The FPO has received organic certification under the National Programme for Organic Production (NPOP) and US Department of Agriculture, which allows them to export their product to Europe and US.



Organic Seed Procurement



Bio Fertilizer Production



Vermicompost and Farm-yard Manure Production



Production and Promotion



Market Linkages and Processing



# 4 Ecosystem

## SwitchON's Organic Ecosystem Development

### IIIS Framework

#### 1 Ideate

- Organic farming promotion in rural areas to adopt profitable sustainable agriculture
- Creating supply chains for input materials and marketing channels for organic products

#### 2 Initiate

- Training sessions on organic farming, capacity building of farmers for production of inputs and scheme linkages for farm mechanisation
- Adoption of a zero-waste production system by on-farm recycling of waste and discards
- Market linkages through ONganic Foods to ensure premium prices of products

#### 3 Incubate

- ONFarm Fresh Innovation Producer Limited formed to collectivise small and marginal farmers into a FPO (business entity)
- Seed Procurement Licence under State Seed Certification Department for the FPO
- Contract Farming of indigenous black & red rice, aromatic rice, oilseeds, pulses and spices

#### 4 Scale-up

- Currently, more than 500 organic farmers under ONFarm and more are joining
- Awaiting Fertilizer Procurement Licence for the FPO to produce and sell organic fertilizers
- Installation of micro-irrigation systems, solar pumps and horticulture practices ongoing to maximise profits and ensure sustainable agriculture model.



## Agri Value Chain

ONFarm Fresh Innovation Producer Limited was SwitchON's pioneer work in organic ecosystem development by creating a complete agricultural value chain based on organic farming practices. Organic seeds are used for rice and other cultivations, which are homegrown or provided by ONganic, the marketing agency. Organic fertilizers are being prepared and used by the farmers, using farm waste and livestock manure. Vermicompost, farmyard compost, bone-meal and compost are the primary bio-fertilizers used. Organic pesticides are prepared and used by the farmers - neem oil and plant extracts are primarily used as bio-pesticides.

SwitchON facilitated training on the preparation of organic fertilizers, growth promoters, pesticides and also the use of sustainable irrigation and harvesting procedures.

This not only made the farmers self-sufficient, but also reduced their input cost and ensured recyclability of farm waste. The weeds and hay from the agricultural field are used as fodder, and this has ensured a healthy livestock of the farmers, supplementing their agricultural income as well. Thus, SwitchON has created this entire zero-waste sustainable organic farming model through ONFarm Fresh Innovation Producer Limited, and is currently expanding this model to other FPOs in West Bengal and other states.



## ONFarm Agri Value Chain

### Linkage with Government Subsidies

SwitchON has helped over 350 farmers by various scheme linkages like organic farming input and marketing subsidies through Rastriya Krishi Vikas Yojana (RKVY), one time assistance for farm mechanisation through Financial Support Scheme for Farm Mechanization (FSSM) and others. Farmers have received financial support for purchase of farm machines like sprayers as well.

### Irrigation Support

SwitchON has enabled solar pump access for farmers in the area. SwitchON has facilitated installation of solar pumps for more than 10 farmers till now, and this has ensured sustainable irrigation water access for more than 200 farmers in the region through decentralised water markets. SwitchON has undertaken a groundwater recharge programme in the area to ensure water sustainability for ONFarm, creating a completely sustainable model for farmers.



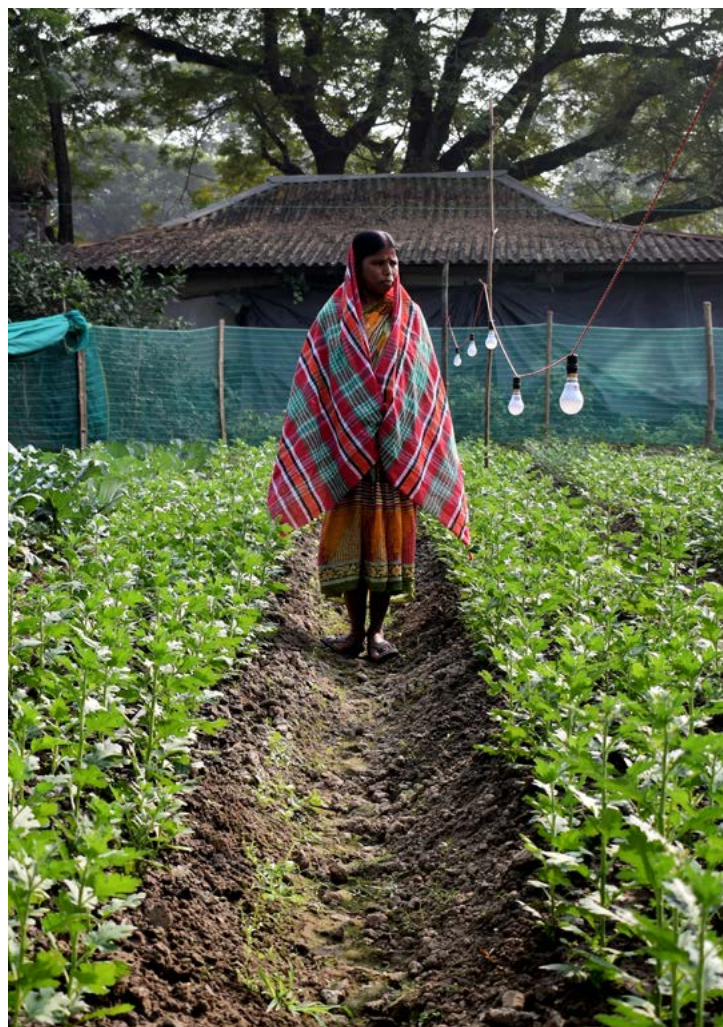
## Agri Extension Support

SwitchON organised training sessions on organic growth promoters and soil testing. Through a mix of both theoretical and practical sessions, preparation and application was explained. Farmers learnt to make Beja Sanjivani (seed treatment), Paudh Sanjibani, Panchagavya, Kunapajala, Sasyagavya, different bio-pesticides and Amrit Pani. Soil sample collection and a free soil testing program was conducted for 100 farmers in ONFarm with support from the Indian Farmers Fertiliser Cooperative Limited (IFFCO). Pre and post-harvest soil testing was provided to assess the nutrient requirements as well as assess the soil health in organic farming.

Investment on vermicompost pits and worms, reduces farmers' input costs by 50%

SwitchON facilitated seed procurement licence from the State Seed Certification Department for the FPO. ONFarm members were trained in Systematic Rice Intensification techniques and organic crop management to ensure quality production as well as seeds being produced. The marketing and business development of these seeds gives a huge financial benefit for the farmers. The sorting, processing and storage of seeds is also facilitated by the FPO.

ONFarm members participated in vermicompost and FYM production training facilitated by SwitchON. With an initial investment on vermicompost pits and worms, the farmers' input costs reduce by over 50%. Farm and livestock waste is recycled in this production process, creating a zero-waste model of production.



## Market Linkages and Processing

SwitchON has facilitated market linkage for the ONFarm FPO with ONganic Foods Pvt. Ltd. who support and market organic products. SwitchON realised that there was a marketing challenge of organic produce, especially to obtain premium prices of organic products. Thus, ONganic Foods was conceptualised, and a sister concern was developed by SwitchON in order to ease out marketing. With time, ONganic has expanded over other areas, but their work began with ONFarm. They buy the products directly from the farmer's field and process the products at in-house processing and storage centres at Hanskhali, district of Nadia. ONFarm has gone into contract farming with ONganic to grow indigenous red and black rice, Basmati rice, Gobindobhog rice, pulses, etc. The farmers receive 10% more than the market price of the produce, and save on marketing, middle-men, transportation and storage costs. More than 500 farmers from ONFarm opted for contract farming with ONganic.

# 5 Impact of ONFarm

**S**witchON has positively impacted the ONFarm farmers associated with the FPO and practising organic cultivation in the agricultural lands. Earlier most of these farmers used chemical inputs in their crops and sold their products at local markets. Currently all of these farmers are growing indigenous black rice and other crops organically, and selling certain products through ONganic Foods.

## Impact on Procurement of Input Materials

The farmers have been practising organic agriculture since the last 7-8 years. With 2 major cropping seasons of monsoons and winter, the farmers keep their land fallow for summer. Grasses and weeds grow during summer on the land, which are mixed with the soil during land preparation for kharif crop, allowing the soil to naturally replenish nutrients. The major organic agricultural practices undertaken by farmers include the usage of organic-certified seeds, cow dung manure and vermicompost as primary organic fertilizers and neem oil and cow urine as primary organic pesticides.

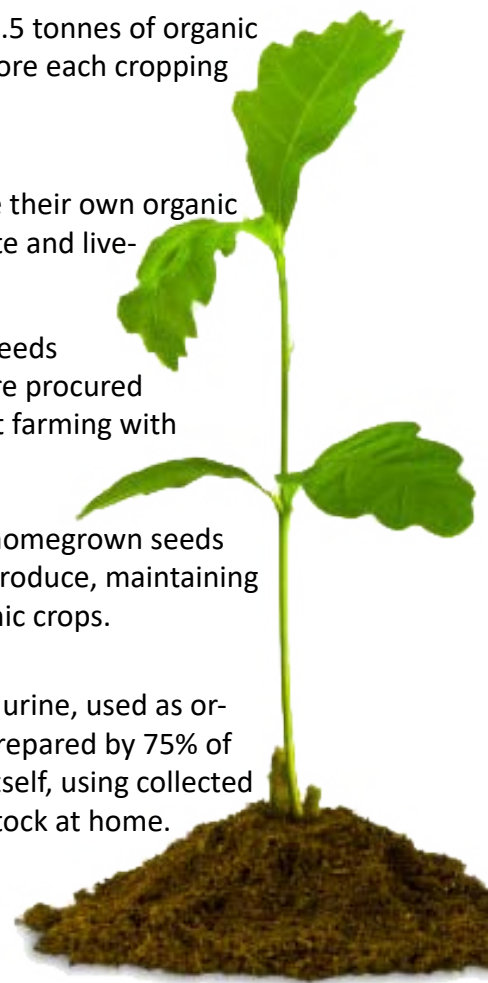
■ Farmers use 1 to 1.5 tonnes of organic fertilizers per acre before each cropping season.

■ 90% farmers make their own organic inputs using farm waste and live-stock discards.

■ Organic certified seeds used by the farmers are procured by the FPO by contract farming with ONganic.

■ Farmers also use homegrown seeds from previous years' produce, maintaining the gene pool of organic crops.

■ Neem oil and cow urine, used as organic pesticides, are prepared by 75% of the farmers at home itself, using collected neem leaves and livestock at home.



Usage of homemade organic inputs and seeds has reduced the total input cost for farmers by 50-70%. Some farmers also purchase organic fertilizers and pesticides apart from making them at home to meet the requirements.

Reduction in Input Cost for farmers **50-70%**

## Impact on Farmers' Income

ONFarm members have been growing crops using organic practices even before FPO formation. However, the marketing of products has been eased out by market linkage with ONganic. Earlier, farmers used to sell the produce in local markets at Krishnanagar (12 km) and Ranaghat (25 km), but were not receiving premium prices for their organic produce due to inability to access larger markets in Kolkata (94 km) and other states. Contract farming of organic crops has removed the transport and processing costs completely.



Transport cost constitutes almost 10% of the total costs, which is saved since the marketing agency comes and collects the produce directly from the farmers' fields.

Post-harvest processing and storage, especially threshing and milling of cereals, pulses and oilseeds and their cold-storage, incurs 20-30% of the total cost which is saved in procurement by ONganic.



Farmers have reported 10-25% increase in income by shift to organic agriculture. Most farmers are currently growing indigenous black rice instead of traditional rice. However the productivity of the former is lower, but due to higher price, the income has been substituted successfully.

Organically grown sesame is sold at 50% higher price than traditionally grown ones. Organically grown mustard and black cumin are sold at 20-50% higher price compared to conventionally grown ones.



Farmers have benefited with the constant guidance and monitoring of crops by the marketing agency. It has reduced crop wastage and saved storage costs for the farmers. Expert guidance allows farmers to take preventive measures against pest attacks and disease infestations.

As a part of the organic farming ecosystem, the

collectivisation of farmers provides a common platform for them to share knowledge and best practices in agriculture. This has enabled an environment of learning and application for the farmers. Due to timely information dissemination, crop loss has reduced significantly, and the surveyed farmers reported almost no crop loss after shifting to organic farming.



## Socio-Economic Impacts

Farmers have reported significant socio-economic upliftment since the adoption of organic farming practices. The income enhancement has led to improved lifestyle, increase in assets and investments and overall betterment of quality of life. All farmers consume organic produce at home and have reported improved health. Farmers have reported improved digestion, lesser occurrence of deficiency diseases and better appetite.



Farmers have bought large farm equipment, like tractors, solar pumps, etc. while many others have been provided spraying machines and threshers through the FSSM scheme. Solar irrigation has ensured uninterrupted irrigation water supply, enhancing the farmer incomes as well. This has motivated farmers to grow short term vegetables, mustard, pulses and invest on banana and orchard plantations for higher profits. All farmers have shown interest in crop diversification and have started vegetable cultivation.

### Lifestyle / Livelihood Changes

### Overall Impact

50%

Renovated or relocated to better housing

Infrastructure development of rural community

40%

Purchased new agricultural land

Expansion of organic agricultural practices

70%

Purchased 2/4 wheeler vehicle for personal use

Enhanced rural mobility

80%

Purchased farm equipment

Farm mechanisation and efficiency

20%

Invested in better education for children

Education and better livelihoods

## Environmental Impact

Organic farming has improved soil health, water availability and overall growing condition of the crops, as reported by the farmers. The usage of organic fertilizers has increased the organic matter in soil, which in turn increases the water holding capacity and provides adequate nutrition to the plants. The usage of organic growth promoters and useful microbes enriches soil nitrogen. Improvement of water holding capacity has led to reduced need for irrigation, thus improving the groundwater condition of the region.



Organic farming is practised collectively at ONFarm, impacting the overall environment of the region. ONFarm member farmers comprise more than 250 hectares of land in Hanskhali block, and this provides an optimum ground for impact understanding. The sustainable ecosystem developed by SwitchON ensures a long term improvement of both farmer conditions as well as mitigate environmental damages caused due to conventional chemical farming.



# 6 Success

## Farmer to Self-Sufficient Entrepreneur



*ONFarm's work in organic farming has not just improved productivity, but also resolved the gap between farmers and the market. It has improved soil health as well as human health. Also, ONganic takes our produce at our doorstep - our stress & costs have reduced and significantly increased our income.*

### Niranjana Mandal

CEO, ONFarm



**N**iranjana Mandal has been an active member of ONFarm since its inception, and has been practising organic farming since 2013. He started with 1 bigha of organic cultivation, and now has over 3 bigha land under organic farming. He grows black rice, mustard, sesame and jute using homemade organic fertilizers and pesticides.

## Impact

Mr Mandal noted that prices received for organic products are about 50% higher than their chemically produced counterparts. He sold inorganically grown Gobindobhog rice at ₹2000 for each 60 kg bag, while he gets around ₹3000 for the same organically grown produce now. Before ONFarm was established, he was dependent on middlemen to sell the produce. Also the saving of input and transport cost made agriculture a profitable business. After shifting to organic cultivation, he realised the improved soil health and healthy & nutritious diet. He noted that food poisoning and gastric problems have reduced significantly after shifting to organic. He looks forward for support in the fruit and vegetables production and marketing for higher profits.

## Organic for Better Health



*Only you surviving won't suffice, you need to save the country as well. Organic farming keeps me as well as others healthy.*

### Chittaranjan Biswas

Farmer, ONFarm Member



**C**hittaranjan Biswas is a progressive farmer at ONFarm who has been practising organic farming for over 8 years now. He cultivates black rice, jute, pulses, flowers and vegetables on his 3 bigha land under organic cultivation.

### Impact

Mr Biswas is extremely satisfied with organic farming. He added that his income has increased by ₹25,000 per year after shifting to organic farming. He emphasises on the environmental and health benefits of organic farming. The organic inputs used in cultivation are not harmful for the environment as well as the farmers themselves. Chemical fertilizers and pesticides have a lasting effect on farmer health, and can cause cancer too. On the other hand organic inputs are safe to use as well as easy to prepare. At the same time, organic foods are good for health as they are free of chemical residues and provide higher nutrition as compared to conventionally grown crops. He is willing to adapt and adopt new technologies and wants to install solar pumps and micro-irrigation in order to make a sustainable organic farm.

## From Organic Farm to New Home



*Organic production has improved soil health and our economic conditions equally. When I place my feet on my land now, I can feel the difference in soil health and the difference organic farming has made.*



### Madan Mondal

Farmer, ONFarm Member

**M**adan Mondal grows black rice, lentils, wheat and vegetables in his 5 bigha organic farming plot. He produces vermicompost on his own plot, and its usage has improved land quality as well as yield. He is a beneficiary of market linkage with ONganic, and specially satisfied with the quality of seeds, and training and guidance provided in organic cultivation.

### Impact

The quality of his produce has enhanced significantly after shifting to organic production. For the same product black rice, the organic produce has 3.5 times the price of inorganically grown ones, even though there is a production decrease compared to inorganic production levels. But productivity is increasing every year, as soil health is improving. This has allowed large profits for him, especially in production of black rice and vegetables.

After organic production, using the profits from agriculture, he has bought a pucca house and a two-wheeler for himself. He has been pivotal in spreading awareness regarding organic farming in the villages, and being a successful organic farmer, he has influenced many other farmers to shift to organic cultivation. He wants to increase his organic vegetable production to reach larger markets.

# 7 Conclusion

**S**witchON's first FPO has become a sustainable model, where economic, social and environmental sustainability is ensured through organic agricultural practices, farmer capacity building and market linkages. ONFarm has been undertaking several steps currently to enhance sustainability as well as expand and promote the ecosystem: SwitchON has created a model farm in Hanskhali to promote organic farming best practices, agroforestry, organic input preparation and sustainable agr-technologies like micro-irrigation and solar pumping systems.

- Improve farm mechanisation by introduction of smart agri-monitoring system
- Promotion of grid-connected and standalone solar pumps
- Promotion of micro-irrigation systems (drip and sprinkler)
- Introduction of high-value organic vegetables and fruits
- Promotion of medicinal plants (Bramhi, Kalmek, *Centella*, etc.)
- Enhance contract farming and market linkages for high value crops introduced
- Promotion of on-farm processing of produce, by farm mechanisation
- Create a streamlined supply chain for perishable high value produce like vegetables
- Exposure visits to promote sustainable agri-technologies and practices in ONFarm





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