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Government of India



# GIC Innovation Booklet





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# Green Innovation Center - Innovation Booklet

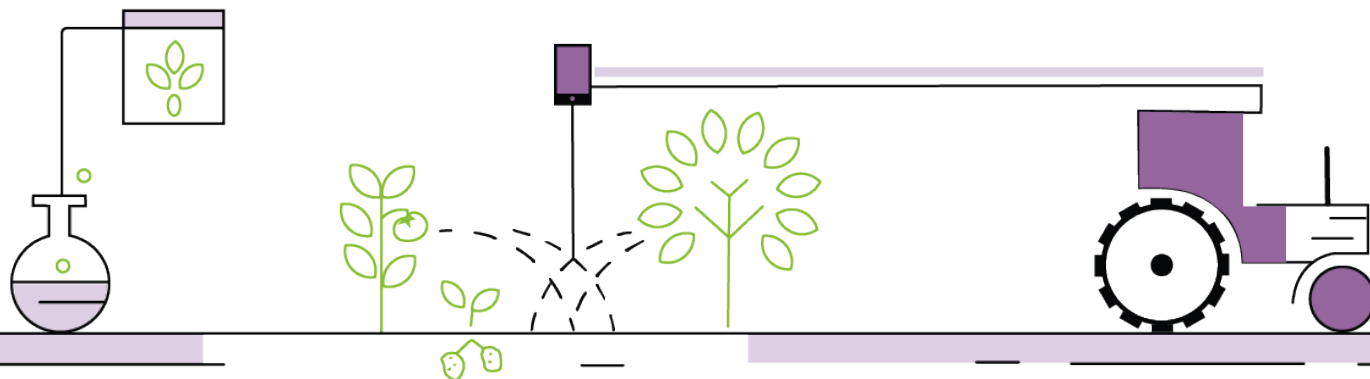
# INTRODUCTION

## 7 Years Of Innovation in the Tomato and the Potato Value Chain

**In this Innovation Booklet, the GIZ global programme “Green Innovation Centres for the Agriculture and Food Sector (GIC) – India” looks back on successful years of testing, developing and scaling various innovations in Maharashtra, Karnataka and Andhra Pradesh.**

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH is a public-benefit federal enterprise of the German Government. GIC Project is funded through the Special Initiative “Transformation of Agricultural and Food Systems” of Germany’s Federal Ministry for Economic Cooperation and Development (BMZ), and implemented in India since 2016 by GIZ in cooperation with the Ministry of Agriculture & farmers Welfare (MoA&FW). Working towards strengthening the local agricultural economy of its partner states, the project has been cooperating with implementing, private, and public partners and most importantly project farmers.

In this Innovation Booklet, we want to highlight our partners’ innovations within the tomato and potato



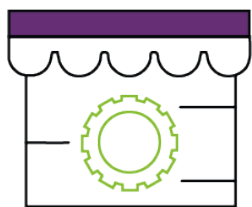
value chains. Although the activities of our project in these two supply chains are coming to an end, the innovations and their successes remain with the partners and the farmers and continue to contribute to sustainable agricultural development. The introduced innovations cover the entire value chain including high-quality seeds and fertilizers, mechanised planting solutions and improved harvesting and (cold) storage technologies. Furthermore, promoting new forms of cooperation between farmers was and will continue to be a crucial area of our work. The booklet is also structured according to the value chain stages – from seeds to plate.

We would like to thank our partners Agriculture and Finance Consultants (AFC), ETC Consultants India Pvt Ltd., Mahila Abhivruddhi Society, Andhra Pradesh (APMAS), Deutsche Welthungerhilfe, Access Livelihoods Group, International Potato Centre (CIP), Centre for Environment Concerns (CEC), SELCO Foundation, SkillGreen Global, Rohitkrishi Industries Pvt Ltd. and World Vegetable Centre and of course the farmers who have all played an important role in this collection of successes and innovations over the past years. Without the excellent collaboration of all stakeholders over the entire project period, we would not have been so successful. This shows that sustainable change can only be achieved through close cooperation and combined forces, as well as innovative ideas.

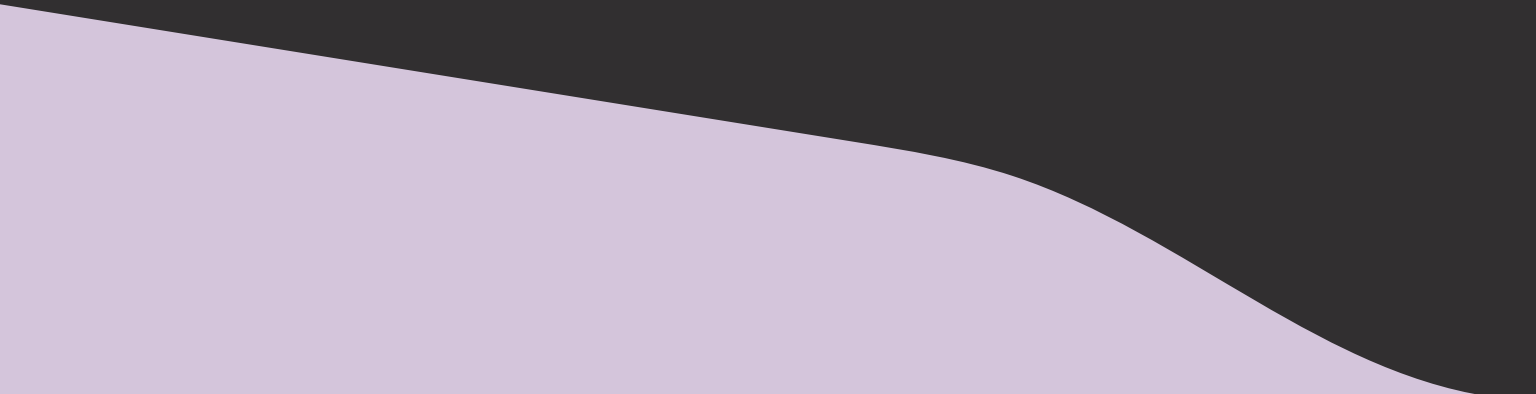
**Enjoy the read!**

**Best wishes,**

**Green Innovation Centre Team India**



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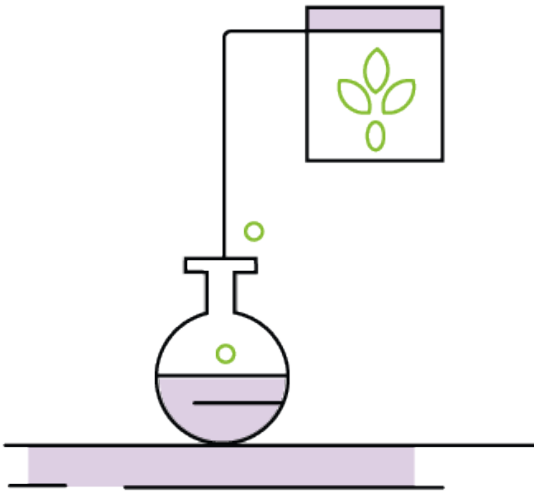
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Good Quality Inputs

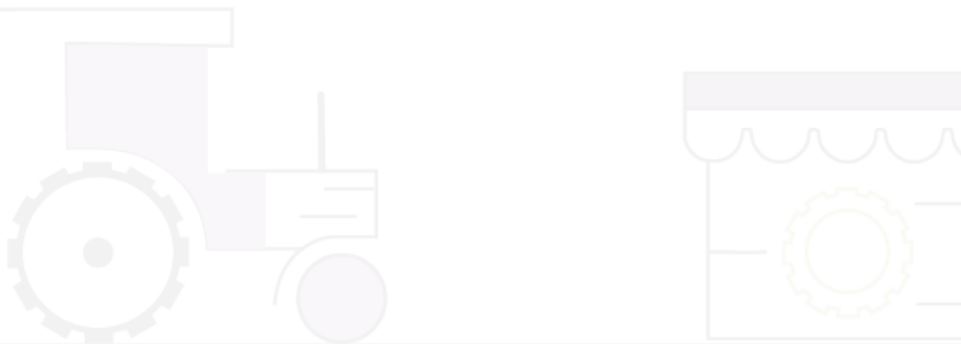
# Decentralised Potato Seed Production: The Impact of Rooted Apical Cutting (RAC) Technology



## The Context

**Hassan district in the state of Karnataka is known as a potato-growing area. The outbreak of the late blight disease and poor seed supply has led to reduced yields and forced farmers to switch to other crops.** This has led to a significant decrease in potato cultivation area, from 50,000 ha to just 10,000 ha in the last decade. The fact that seed potatoes are being imported from Punjab state which is located 2000 km away further exacerbates the problem for the farmers in Hassan.

The Green Innovation Centre project has been making efforts to revive the potato sector in Hassan district since 2016. One of the initiatives under this project is the promotion of the Rooted Apical Cutting (RAC) Technology by the International Potato Centre CIP in collaboration with the University of Horticulture Sciences Bagalaket (UHSB) and the Department of Horticulture (DoH) since 2020.





## The Solution

The RAC technology is a method of potato seed production that allows farmers to produce high-quality seeds locally, reducing costs associated with seed transportation. This technology involves

- In-vitro multiplication of potato plantlets in a tissue culture lab
- Production of rooted apical cuttings in nurseries
- Planting of RACs in the field to produce G0 tubers
- Further seed multiplication for a couple of seasons

This technology has the potential to improve seed quality, increase yields, and reduce the spread of disease. By promoting the RAC technology, GIZ, CIP, UHSB and DoH are helping to improve seed self-sufficiency in the region, which can help reduce dependency on imported seed potatoes and improve the livelihoods of farmers in Hassan district.



## The Impact

The RAC technology allows farmers to produce high-quality seeds locally, reducing costs associated with seed transportation. Additionally, it allows for faster multiplication of new varieties, taking only two years as opposed to the traditional seven. In states like Karnataka, with two planting seasons, this technology has the potential to make the state an alternate hub for potato seed production in India.



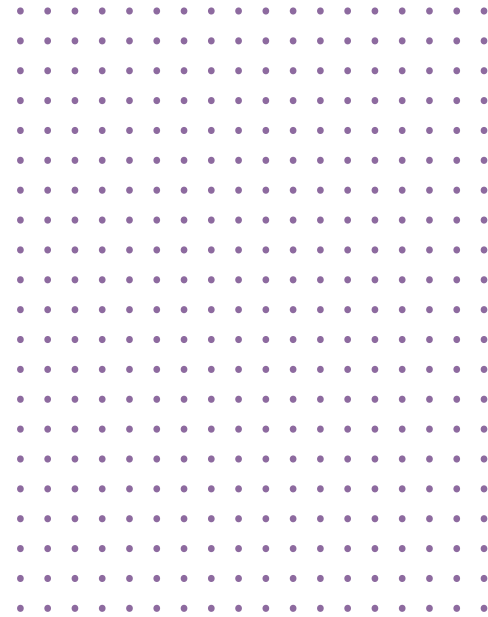
The RAC technology presents a significant opportunity for entrepreneurs who wish to enter the field of seed production. By producing RACs, minitubers and seed potatoes, entrepreneurs can take advantage of the cost-effectiveness and rapid multiplication benefits of the technology. Additionally, the use of RAC technology creates numerous employment opportunities, particularly for women, throughout the entire seed value chain. This includes jobs in the production, transportation, and distribution of RACs and seeds, as well as in the operation and maintenance of the necessary equipment and facilities.

Conventional seed production typically involves planting expensive minitubers produced using aeroponic systems. However, with the use of RAC technology, these minitubers can be replaced with RACs in the conventional system. Promoting RAC technology is challenging in states like Punjab, where extreme weather conditions make it difficult for nursery activity. In such cases, RACs can be shipped to northern India from Karnataka state via air cargo. Private nurseries in Hassan have begun to sell RACs to Northern states, creating a mutually beneficial situation for both seed multipliers in Punjab and nurseries in Karnataka. Seed growers in Punjab can acquire RACs at a cost that is 50% lower than minitubers, potentially disrupting the seed market in India.

## Contact

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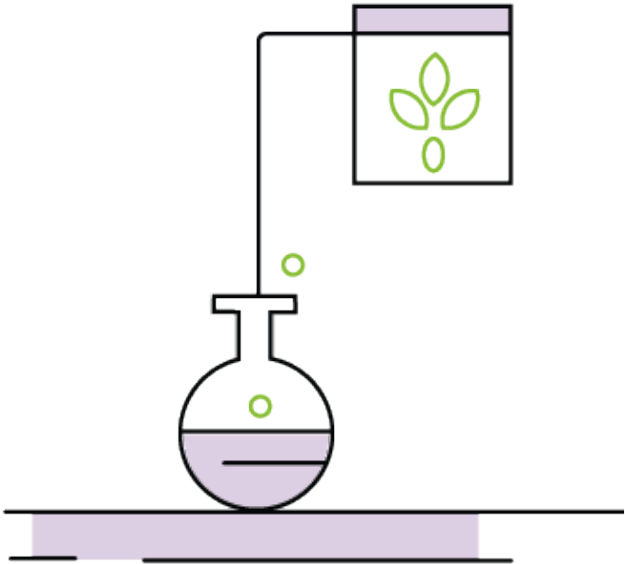














## Good Quality Inputs

# Improved Nursery Management



## The Context

**To increase the productivity of crops thereby increasing farmers' income, it is not enough just to implement focused interventions in the production side of the value chain.** Interventions need to be designed during the pre-production and post-production stages as well.

In agriculture, procuring the best quality seeds and seedlings is of utmost importance as it is one of the critical inputs which affect the crop yield. Availability of quality inputs, especially seeds and seedlings, is one of the major factors which has a direct impact on the health of the crop and yield. Many plant diseases can be prevented by adopting best practices at the nursery level.







## The Solution

A few years ago, farmers used to raise the seedlings themselves, however, the seedlings used to get affected by soil-borne diseases. With the advent of greenhouse nets, farmers started to purchase seedlings from nurseries, which already have good growth. However, none of these nurseries was registered thereby the farmers were not secured in the event of failure of the crop. Moreover, with a set of packages of practices for nursery management, it could be ensured that healthy seedlings are grown.

APMAS as an implementing partner for the GIC project strategised its interventions to work with the nursery owners in promoting model vegetable nurseries by providing advisory services and technical inputs so as to ensure best practices in raising high-quality seedlings, which in turn will lead to good quality of tomato production with minimal problems of pests and diseases.

### **There are 15 best practices to follow in a model vegetable nursery to produce healthy and quality seedlings:**

1. Maintaining double door system
2. UV stabilized insect-proof net with 40 mesh
3. Raised bed/tables
4. Usage of quality and big protrays
5. Quality seeds
6. Usage of weed mat
7. Ensure water quality (pH = 6.6 - 7, EC < 1mS/cm)
8. Usage of sterilised cocopeat as a growth medium
9. Water breaker nozzle with many holes
10. Integrated pest management: Sticky and pheromone traps and neem oil
11. Hardening of seedlings

12. Trained and skilled workers in the nursery
13. Using crates for seedling transportation
14. Billing system for transparency
15. Information display (seedling stock and price)



## The Impact

- Adopting these best practices in model vegetable nurseries has resulted in healthier, disease-free seedlings → Reduction of cost of cultivation (5 – 10%) for farmers
- Due to healthier seedlings, increase in the turnover of farmers
- Mortality rate of seedlings decreased
- Employment generation: Each model vegetable nursery generated a minimum of 2-3 permanent labour and 3 seasonal labour depending on the scale

## Contact

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# Success Story

## Sri Venkateswara Model Nursery, Miniki GP, Ramasamudram Mandal

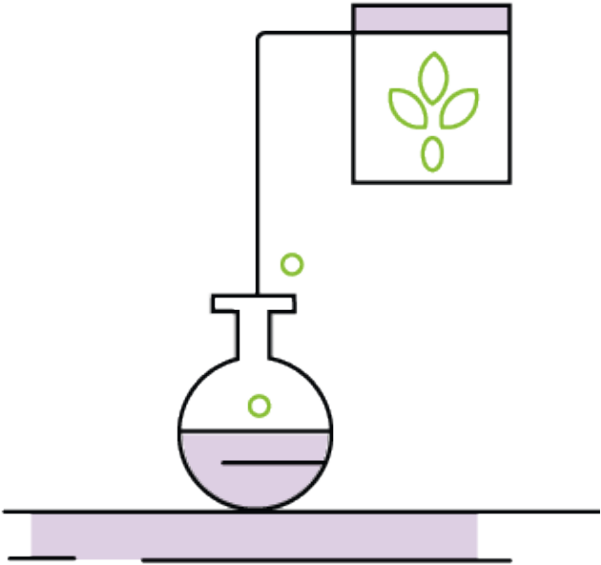
**The nursery business has become a successful enterprise for the family due to their commitment, dedication and management. The enterprise supplies high-quality and healthy seedlings to tomato farmers.** The total sales have increased considerably from 2016, especially after GIC project interventions from May 2017 onwards. Apart from the increase in sales and profit, the nursery business has gained much visibility.

- Around 70 farmers from Miniki and KC Palli reported that the seedlings from Miniki model nursery performed well by giving a good yield
- The price was reduced by 0.5 paisa when compared to other nurseries which resulted in attracting more farmers as well as gaining popularity in the region
- Since the credit is allowed, more farmers are able to avail healthy seedlings
- Horticulture Officer who visited the model nursery applauded the interventions and disseminated the best practices to nursery owners in the district
- Farmers from Prakasam district visited the model nursery arranged by the horticulture department and got inspired to adopt the best practices
- The nursery owners from various parts of the mandal/district were visiting the nursery to learn the best practices adopted. The visitors got motivated to adopt similar practices.
- The family gives employment to one permanent labour and six women as daily labour to take care of various tasks of nursery management
- Vasudeva Reddy and Kalavathi are engaged full-time with the nursery management
- A second new nursery was established on 26 January 2018 which is a stone-type naturally ventilating insect net-proof house
- The family is now able to educate the younger daughter who is currently doing a Master's in Business Administration
- The family has constructed a new house adjacent to the nursery site





**apmas**





## Good Quality Inputs

# Dual-Purpose Tomato Varieties



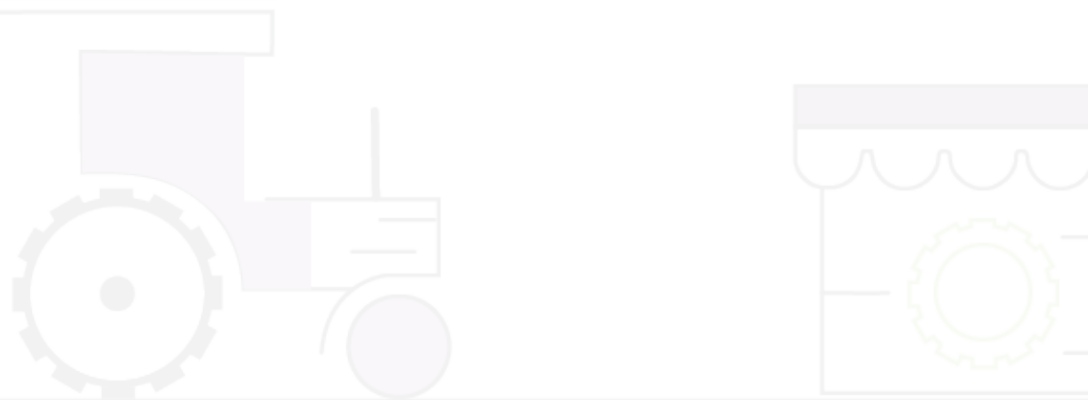
### The Context

APMAS started various innovations in the tomato value chain particularly for the promotion of hybrid seeds to increase productivity in tomato cultivation.

At present, the farmers are using round-shaped and semi-determinate tomato hybrids having 120 -140 days duration and their productivity is rather low, i.e. 50 - 70 t/ha.

**Further, these varieties are not feasible for distant markets:** Tomatoes have high water content and a shelf life of less than 5 days which is why they cannot be transported to far-off places.

**Further, it is not suitable for processing:** round-shaped, semi-determinate tomato hybrids have less pulp content and high-water content in the fruit which requires 10 - 12 kg of fruit to produce 1 kg of tomato puree.





## The Solution

To overcome the above issues, APMAS introduced a new variety of seeds with oval-shaped semi-determinate dual tomato hybrids (Rishika, Syngenta:6242, Ansal, etc.). The following features are important characteristics of the new seed variety.

#	Parameter	Units	Round-shaped semi-determinate tomato	Oval-shaped semi-determinate dual tomato hybrids
1	Duration	days	120 - 140	150 - 180
2	Yield per ha	tons	50 - 70	100 - 125
3	Quantity of tomatoes required to prepare 1 kg puree	kg	10 - 12	6 - 7.5
4	Shelf life	days	3 - 4	10 - 12
5	Colour value		1.5 - 1.7	1.9 - 2.3
6	Brix value		2.5 - 3.0	4.5 - 5.0



## Impact

APMAS is encouraging the farmers to plant new varieties of seeds in the project areas of Nimmanapalle, Madanapalle, Ramasamudram and Palamaner mandals. The number of farmers that are starting to plant dual-purpose tomato hybrids is demonstrated in the following table. There is significant progress in every year observed. Now, a significant number of farmers comes forward to undertake the new dual varieties of tomato without any support. These new varieties show almost a doubling in productivity figures.

### Scaling of hybrid tomato cultivation year-wise and no. of farmers:

Year	No. of farmers	Area in extent (ha)
2018 -20	10	4.6
2020 -21	16	8.6
2021 -22	39	23.15

## Success Story

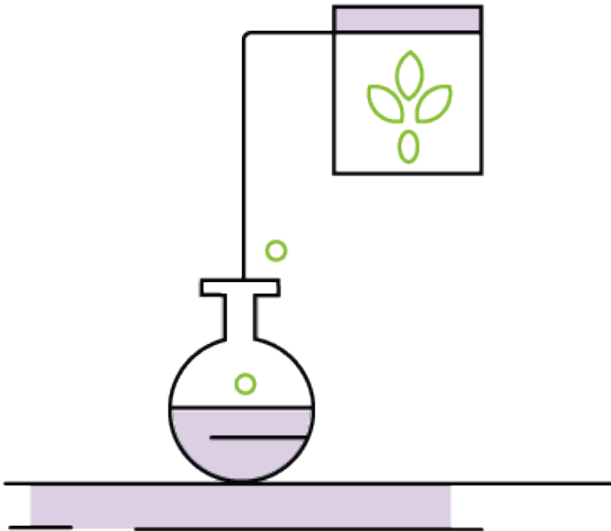
In Madanapalle mandal, Sri. Sreeramulu Reddy has cultivated 0.4 ha area of land in 2020 and 2021. He cultivated the hybrid tomato variety Rishika. The farmer was given timely technical support from the seedling stage to harvesting and practicing. APMAS organised trainings with the Department of Horticulture and made exposure visits to the Kolar area where predominantly hybrid tomatoes are cultivated.

### **Innovations practiced in this plot:**

1. Nursery seedlings from model nurseries
2. Trichoderma and Pseudomonas culture application
3. Border crop Jowar
4. Sticky and Pheromone traps
5. Solar light trap
6. World Vegetable Centre guided tomato crop practices

**The farmer observed good crop growth and good height and got a harvest of 52.4 t of tomatoes. He marketed the produce at the tomato market in Kolar, Karnataka state, where the hybrid tomato prices are good, and a greater number of buyers are present. He got 22 pickings from his field. He earned a total of Rs. 508,377 and his net profit was Rs. 147,399.**





## Good Quality Inputs

# Farmer Development Centre



### The Context

**A significant part of the cost of cultivation for farmers goes into the purchase of inputs. The inputs applied not only determine the extent of the cost of cultivation but also affect the quality of the produce.** The farmers of Madanapalle region in Chittoor district, Andhra Pradesh, face multiple challenges when it comes to purchasing inputs for their crops:

- Lack of availability of quality fertilizers
- Dependence on unqualified salespersons at the input shops for suggestions.
- Higher prices of inputs as main dealers are not available in the vicinity.
- Middlemen sell seeds, fertilizers and other inputs to the farmers on a credit basis and buy their produce after harvest. Though this arrangement provides a cushion to the farmers in terms of not having to pay for inputs immediately, the produce from the farmers is bought at prices much lesser than in the open market.
- There are limited testing facilities for agricultural inputs like seeds, fertilizers and pesticides in the state which lead to the supply of low-quality input causing losses to farmers.





## The Solution

In this context, it was important to have a platform like the Farmer Development Centres (FDC) at the mandal/block level to provide quality inputs to farmers at lower prices, deliver advisory services through videos, pamphlets and interactions with agriculture graduates to effectively address the needs of every farmer. The FDCs as a part of the new emerging ecosystem, linked globally, have a twin role to help build the socio-economic resilience of farmers and lead them to achieve several sustainable goals:

- **Bulk Purchase:** The FDCs procure large quantities of products from companies so that the farmers benefit from the economies of scale.
- **Timely availability of inputs:** The FDCs place indents and supply inputs to farmers in a timely manner throughout the season.
- **Quality of inputs:** The FDCs have good tie-ups with branded companies and locally demanded products.
- **Lower prices:** The FPCs are doing business with small margins which ensures better prices and savings for farmers.
- **Place of accessibility:** Provision of a platform to access all the farmer inputs in one place.
- **Tie up with eFresh:** The FDCs are established in partnership with eFresh Agri Business Solutions which benefits the FPOs in terms of market knowledge and provision of software to record and track all the financial transactions.
- **Technology:** The FDCs collect members' data and create WhatsApp groups to provide periodic information on weather, crop management, pest and disease management and soil management.





## Impact

- A total of eight FDCs were established in the Madanapalle cluster, with a cumulative turnover of Rs. 17.78 crores business in three years.
- In all FPOs, 70 % of the farmers are purchasing inputs from FDCs.
- The FDC business forced other input dealers to reduce their prices in competition with the FDC.

## Contact

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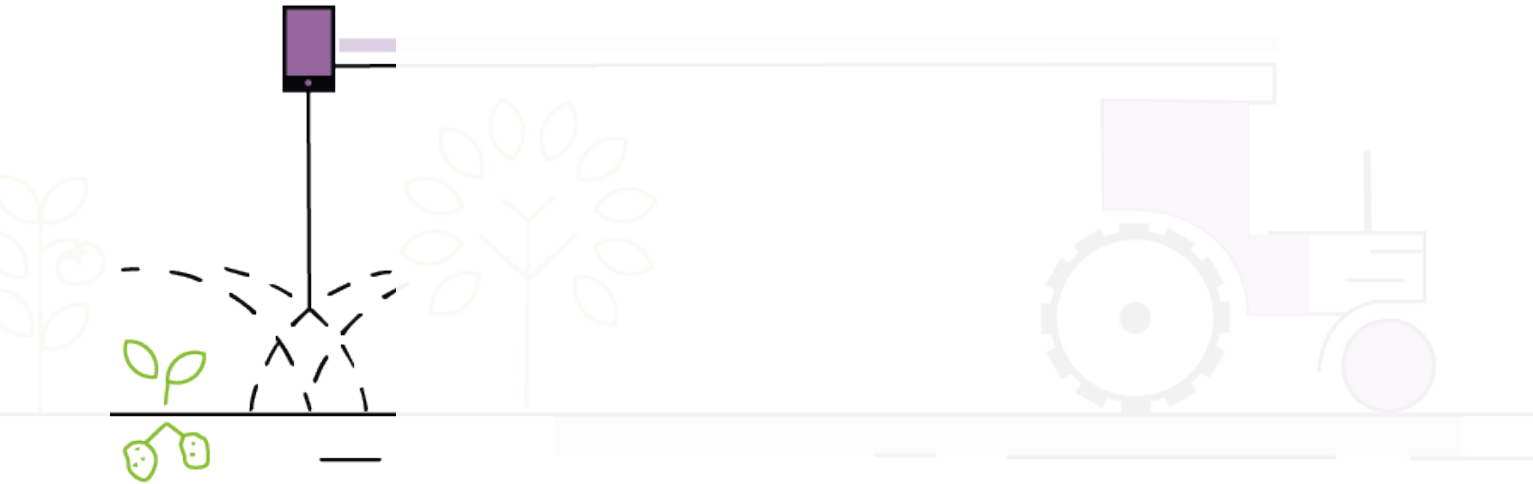








• Choices • Voices • Capabilities



## Irrigation

# System of Water for Agriculture Rejuvenation (SWAR)

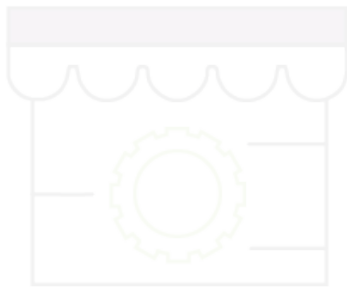


## The Context

**The water efficiency of Indian agriculture is 36 %, in comparison to that of other huge nations where the water efficiency is 84 %.** Indian agriculture suffers from droughts, groundwater scarcity, increasing heat waves, poor soil health, low crop resilience to climate change, salinization, polluted water bodies and low farmer incomes.

While 'state of the art' irrigation technology is drip irrigation and precision irrigation, they have consequences for the environment. The drip irrigation logic is 'field capacity until withering', which favours the application of chemical fertilizers but is detrimental to the survival of biological organisms in the soil, while precision irrigation uses plastic mulch, resulting in no soil aeration and dead soil.

Agroecology requires a fundamental rethinking, starting with irrigation.





## The Solution

Centre for Environmental concern's innovation, the "System of Water for Agriculture Rejuvenation" (SWAR) is a measured moisture diffuser embedded at the plant root zone with drip lateral sending water into a perforated box with granular cut-to-size quartz. Design software and field testing led to the ideal box size, shape, and height for slow water release and maximum moisture spread. A portable or embedded moisture sensor probe helps farmers know root zone moisture status to plan irrigation. An advisory guides farmers to prepare microbes and mycorrhizae inoculums locally for efficient water use with healthy soils. Measured root zone moisture is a rich ecosystem for biological soil health, low weed growth, 25 % less need of soil nutrients, higher productivity and better produce, plant resilience and brings water application down by 60 %.

### **SWAR solution offers:**

- Moisture at the plant root zone to save water
- Measured moisture to minimize water application
- Microbe inoculates for efficient plant use of soil moisture and soil health
- Mycorrhizae for effective root moisture absorption and spread
- Management ease with data-based farmer decision

SWAR saves water, improves soil health, builds plant resilience, and cultivates healthy crop. SWAR rations water to address the high tree mortality due to root zone moisture, saving valuable farmer assets.



## The Impact

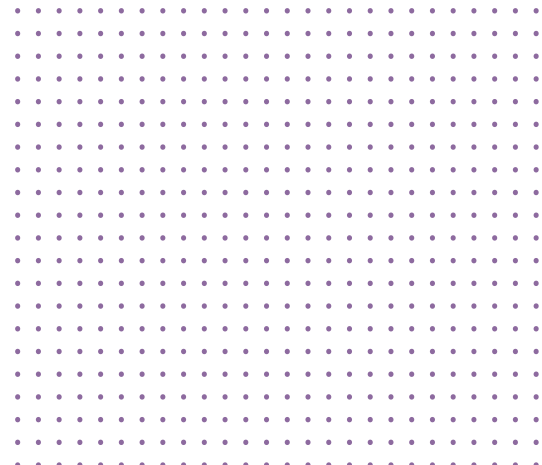
In the GIC project, SWAR as compared to drip and precision irrigation shows to use 40-60 % less water, 10 % higher yield and improved crop produce quality, 15 % more biomass and higher root-to-shoot ratio, 20 % less nutrient application, 30 % less electricity, use of lower HP solar pumps, 60 – 75 % less labour cost on weed control, works with saline water and ration water to moist the root zone and save high fruit trees from mortality.

On soil microbe inoculum Department of Agriculture and Life Sciences, Central State University, Iowa, USA writes “we found this product very effective in farm trials and field testing conducted in the tropical conditions in India. The Centre for Environment Concerns is now conducting a series of long-term experiments to find the mechanism of nutrient conversion and assimilation at the root zone of the crop. The results are expected to be available in 2025. Further long-term research is required to develop the product into a commercial product with an international stand”.

## Contact

### Centre for Environment Concerns#

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## Success Story

In 2022, SWAR won the Indian Council of Agriculture ARISE-PUSA-KRISHI award, the FICCI (Federation of Indian Chambers of Commerce & Industry) Special Jury Water Technology Prize and a grant of Rs 5,000,000 from ACT Environment Trust to establish a Business Organization for Scaling.









## Sustainable Production

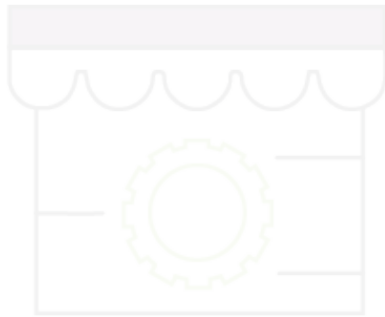
# Centralised Solar-Powered Sprayer



## The Context

**Tomato plants are prone to damage at all stages of growth.** They can be damaged by a variety of insects and pests. Such disease and pest infestation result in immense wastage of crops, financial losses for farmers, increased input costs due to lack of optimal usage of pesticides and pose threat to food security.

Currently, battery-operated knapsack sprayers are used which are extremely heavy and are carried on the farmer's back. Each battery is charged for 6 hours to run the sprayer for 2 hours. Farmers constantly need to move around on the farm for charging points (often in the house) disrupting the workflow on the farm. **The unreliability of electricity and untimely power cuts adds to the inconvenience.**





## The Solution

Centralised solar sprayers are operated using a battery with the help of a hose pipe. This type of sprayers pump the chemicals from the central tanks with a large capacity which is used for applying pesticides, insecticides, or liquid-type chemicals over extensive land coverage. The sprayer unit can be charged through solar, battery and single-phase grid supply and comes with an inbuilt charge controller. It can spray up to 300-400 litres of chemicals in one full charge compared to 100-200 litres in knapsack sprayers. The sprayer unit can be placed next to the chemical tank and a hose pipe up to 700 feet can be connected eliminating the need of carrying the sprayer unit at the back. Solar-powered sprayers can be highly beneficial in areas where there is a lack of electricity or an erratic supply of grid electricity.



## The Impact

- Affordable solar-powered sprayers reduce drudgery and increase productivity and income among small and medium farmers.
- Reliable infrastructure such as solar sprayers eliminate the threat of crop wastage and ensure crop availability for other parts of the tomato value chain.
- The sprayer is easy to use and requires lesser maintenance compared to petrol sprayers making it user and farmer-friendly
- Solar sprayers eliminate the expenses made on petrol and labour required in manual spraying thereby increasing savings.

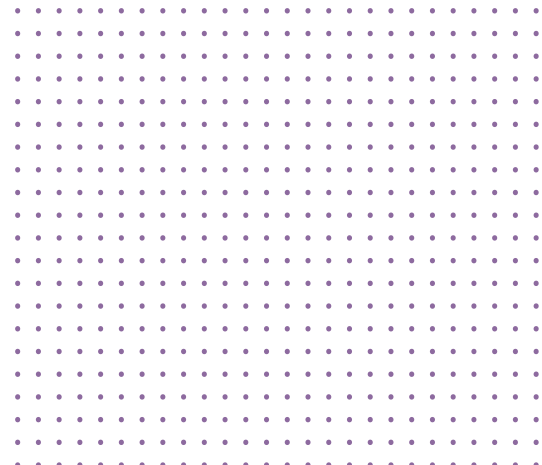


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## Success Story

Tulsiram Reddy is a farmer from Muvedu Cross, Chittoor district in Andhra Pradesh who grows tomatoes and groundnuts on his 8 acres farmland. Tulsiram previously used a knapsack sprayer to irrigate his tomato field. He was subjected to drudgery as he had to not only manually irrigate the field but also had to make repeated trips to refuel the knapsack sprayer. He also had to spend money on petrol for operation. His petrol sprayers also included constant maintenance.

The solar-powered centralised sprayer system was installed at his farm. The installed solar sprayer has cut down his drudgery substantially, as it ensures direct irrigation from the tank and has eliminated trips to refill water or pesticides. The solar sprayers have also cut down on the time he used to spend on refilling and manual irrigation proving to be quite time efficient. Earlier, Tulsiram had to spend almost Rs. 300-350 on petrol for each cycle of spraying which used to take place at least once or twice per week. He would subsequently also spend around Rs. 300 each cycle on the labour involved during irrigation.









## Sustainable Production

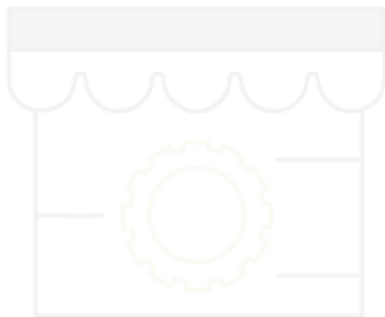
# The Boom Sprayer – Efficient Application Of Liquid Crop Protection And Fertilizer Production Using Improved Nozzles



## The Context

Farmers traditionally use knapsack sprayers, petrol sprayers, or pump sprayers. It was observed that with those types of sprayers with a defective nozzle, most farmers were not able to apply pesticides evenly on the crops. Another problem is that in the Kharif season spraying windows are very short; especially against Phytophthora in potato and tomato crops. This means that farmers only have very limited time to spray their fields.

In our project areas, dry periods in the rainy seasons are often very short resulting in rains washing off the just applied chemicals (typically the preventive chemicals require a drying period of 3 hours after application). Traditional spraying methods require about 4 hours of spraying per acre while the boom sprayer can do the job in about 1-1.5 hours.



Knapsack sprayer with defective nozzle results in more discharge of spray liquid and uneven distribution of sprays over the crop and a lot of chemicals just dropping on bare soil. The farmers are moving a spray gun from one row to the other and consequently spraying the soil and spraying with large droplets that tend to flow off the leaves. Consequently, large amounts of pesticides are wasted. The boom sprayer with the proper nozzle can reduce the amount of pesticides applied by up to 50 % as only the crop is sprayed and then with an appropriate drop size, so effectiveness is increased.

Another issue targeted is the exposure of farmers to chemicals as in traditional spraying method with Knapsack sprayer the exposure of farmers to chemicals is more and many backpack sprayers are leaking.

The fact that labour is scarce in rural areas creates an additional problem when there is an urgency to spray the fields. Labour for spraying is simply not available. The combination of these problems leads to an increase in the end to pest and disease infestations, which could have been easily prevented.



## The Solution

A boom sprayer is a manually carried spray boom for the efficient application of liquid crop protection and fertilizer products. For the development of the new spraying technique, the following conditions had to be met by the boom sprayer:

### Spraying:

- Even spray from all nozzles: pattern and discharge
- Correct overlap of spray fans (pattern). spray liquid from fans should not collide
- No liquid dripping from the boom when pressure is off
- Readable and controllable discharge
- Good quality hosepipe
- Minimal drift

### Operators:

- No wetting of the operators
- Operators do not pass through already sprayed canopy
- Limited damage to the crop by the hosepipe and operators

### Additional criteria:

- Working width can be made as desired by the owner/operators
- Possibility of partial shut off the boom
- Minimal blockage of nozzle orifice
- Easy dismantling of nozzle holder for quick access to clean nozzles
- Easy dismantling of whole boom set for easy transportation
- Interchangeable nozzles for different operations



## The Impact

- Uniform spraying: Covers full canopy, no missing of plants
- Less time: for 1 acre of land, only 20 minutes are required
- Less water requirement: 100 – 120 litre per acre
- Less damage to the standing crop while spraying
- Quicker operation in less time: 18 ft field covers at one time
- Less labour: only 4 - 5 labourer for spraying are required

## Contact

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# World Vegetable Center



## Sustainable Production

# Management of Tomato Leafminer, *Tuta absoluta*



### The Context

**India is the second largest tomato producer in the world after China, however, the presence of the invasive tomato leafminer, *Phthorimaea absoluta* (formerly *Tuta absoluta*) among other known insect pests, threatens the tomato industry in India.** Therefore, the development of control strategies that integrated environmental solutions, including the use of biopesticides, as well as other cultural, mechanical, and biological control strategies, becomes highly imperative as the use of chemical pesticides could generate a negative impact on beneficial fauna, and can generate health and environmental challenges, including the increased concern of insecticide resistance of insects challenged with high doses and frequencies of chemical pesticides.







## The Solution

The World Vegetable Center (WorldVeg) has trained participants in several countries (India, Cambodia, Laos, Thailand, Kenya, Ethiopia, Benin, etc.) where the invasive tomato leafminer poses an important threat to tomato production for smallholder farmers. Participants learned about general aspects of the insect pest, including its current distribution, major and alternate host plants, life cycle, most damaging insect stages and expected damage at different crop stages, and the importance of rational use of chemical pesticides to reduce insecticide resistance.

In addition, WorldVeg trained participants on the use of proper customary cultural practices for tomato production, including the use of seedling traits and healthy seedling production, nutrient and water management, staking, weeding, timely destruction of crop residues, use of pheromone traps as monitoring and mass trapping tools, sequential application of biopesticides, including *Bacillus thuringiensis*, *Beauveria bassiana*, *Azadirachtin* (neem), and rational use of selected chemical pesticides (low toxicity, low residue) and based on proper monitoring, the development of a tailored IPM package based on local availability of inputs, the cost:benefit ratio of the IPM package, and the ecosystem services from the use of an IPM strategy compared to the sole reliance on conventional chemical pesticides.

Three PhD students were associated with WorldVeg to develop and validate the IPM components for the management of the pests and the results obtained from their studies were included in training the farmers and extension personnel. The final components of the IPM package are microbial pesticides (*Bacillus thuringiensis var kurstaki*, *Beauveria bassiana*), neem products and a chemical pesticide (*chlorantraniliprole*).



## The Impact

In 2018 and 2019 the integrated pest management (IPM) package was piloted for two seasons through farmers' participatory trials in three blocks of Chittoor district in Andhra Pradesh. The performance of the IPM package was on par with the Farmers' practice (calendar-based application of chemical pesticides) in reducing *P. absoluta* infestation, without any compromise in the marketable yield. The excessive spraying of chemical pesticides in the Farmers' practice led to an increase in the protection cost, which was nearly two times higher than that of the IPM package. Thus, the farmers experienced an increased income besides reducing the pest incidence substantially. As of 2019, the IPM package was scaled out to about 200 farmers in Andhra Pradesh and Telangana. However, a detailed impact assessment study is yet to be conducted.

Location	Season	Treatment	Cost of Spraying (Rs/ha)	Surplus Income over Control (Rs/ha)	Benefit/Cost
Nimmanapalle	1	IPM	1500	3852	2.57
		Farmers' practice	3000	4188	1.40
	2	IPM	1500	6408.5	4.27
		Farmers' practice	3000	7773.5	2.59

Location	Season	Treatment	Cost of Spraying (Rs/ha)	Surplus Income over Control (Rs/ha)	Benefit/Cost
Madanapalle	1	IPM	2000	4354	2.18
		Farmers' practice	4000	4510	1.13
	2	IPM	2500	11896.5	4.76
		Farmers' practice	5000	14056	2.81
Kurbalakota	1	IPM	2500	11266	4.51
		Farmers' practice	5000	8153.4	1.63
	2	IPM	2500	15081.5	6.03
		Farmers' practice	5000	17822	3.56



## Contact

**World Vegetable Center (South Asia/Central Asia)**

ICRISAT Campus

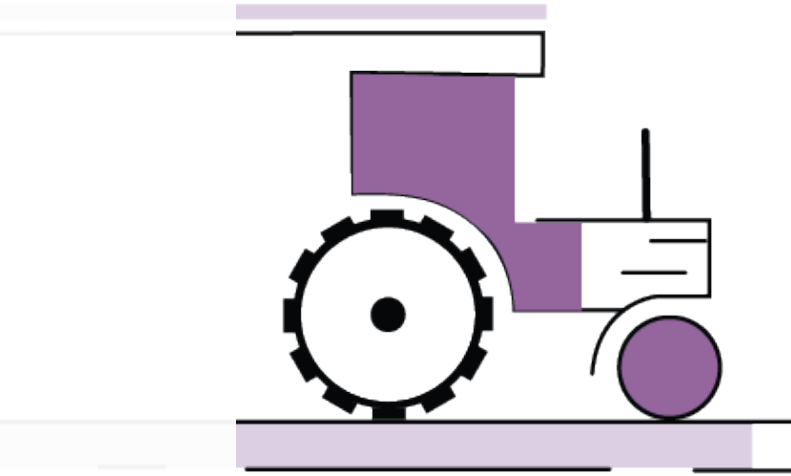
Hyderabad, IN 502324











## Mechanization

# Potato Planters



## The Context

Potato cultivation is important for farmers in Hassan district (Karnataka) and Pune district (Maharashtra).

There are several challenges farmers face regarding the establishment of a good potato crop stand:

- **Poor germination of planted seed potatoes**
- **Shortage of labour for planting operations resulting in high costs**
- **Suboptimal plant density**

The poor germination of seed potatoes is partly caused by conventional planting methods (handplanting). When planted in a layer of soil that gets water saturated very easily, the likelihood of rotting is very high. Furthermore, planting by hand is not very accurate.

Additionally, planting the seed potatoes at the right time is crucial for a good harvest. However, since labour is short during the time of planting, farmers are confronted with high labour fees.





## The Solution

Based on an assessment of the needs of smallholders, it was decided that a cost-effective semi-automatic potato planter would be developed.

A collaborative, participatory technology development approach was adopted by bringing together international experts in potato machinery design with an Indian agri-machinery SME and combining it with the ongoing inputs and feedback of Indian farmers throughout the development and testing process.

### **Mechanised potato planting solves several issues in one go:**

- It places seed potatoes in a ridge well above the water-saturated area
- It reduces dependency on available labour as only a few workers are required
- It is cheaper per acre than handplanting
- It plants accurately and can come close to optimum plant density
- Uniform depth of planting the seed potatoes will make mechanised harvesting possible
- Weeding costs are reduced, especially when combined with the use of a ridger at a later stage in the crop cycle.

We have developed two different planters: a two-row semi-automatic ridge or bed planter, without depth regulation and a fully-automatic one-row planter with depth regulation.

### The planters characterize by the following benefits:

- Costs as low as possible
- Can be used by low horsepower tractors (between 30 - 40 hp)
- Combinable with automatic fertilizer application to reduce the fertilisation costs for farmers
- Small turning area because the ensemble is not too lengthy
- Suitable for ginger planting to increase the income earning capacity



### The Impact

At present, most sales are realised by the companies that sell semi-automatic two-row bed planter without depth regulation. These are cheap but perform reasonably well. Presently more than 80 % of the farmers in the project area use planters, up from about 5 % in 2015.

The yield and financial differences between the Akshaya and Rohit semi-automatic planters with depth regulation were not very substantial which is why farmers opted for the more expensive Rohit planter. The semi-automatic planters require 3 - 3.5 hours per acre and need 4 persons during planting operation. The accuracy of the semi-automatic planters with regard to planting density is improved over handplanting but still locations are missed if labourers cannot cope with the speed of the tractor.

Rohit's **single-row automatic planter** has been fully developed under the project and can be operated by small tractors from 27 hp onwards. Adding a 15-kg fertilizer box is possible. This planter is fast, requires only 2 persons and is very accurate in planting (both spacing and depth).

2 persons can plant and fertilize 1 acre of land in 2 - 2.5 hours depending on the length of the field.

The Rohit planter shows very good results in yield, which is **30 t/ha as compared to 22.5 t/ha** in conventional method. The **extra yield of 7.5 t** has a value between additional Rs. 75,000 - 120,000. The purchase price for this planter is about Rs. 120,000. **Thus, the return to investment is less than two years.**

### Overall impact of the improved practices using planter:

(Source: Field trials in Innovation farms in 2018)

Particulars	Hassan, Karnataka		Peth, Maharashtra	
	Farmer's practice	Improved practice	Farmer's practice	Improved practice
Cost of cultivation (Rs/ha)	102,000	125,650	105,000	102,442
Yield (tons/ha)	12.5	20	20	28.57
Gross income (Rs/ha)	125,000	200,000	187,500	268,324
Net Income (Rs/ha)	23,000	74,350	82,500	165,880

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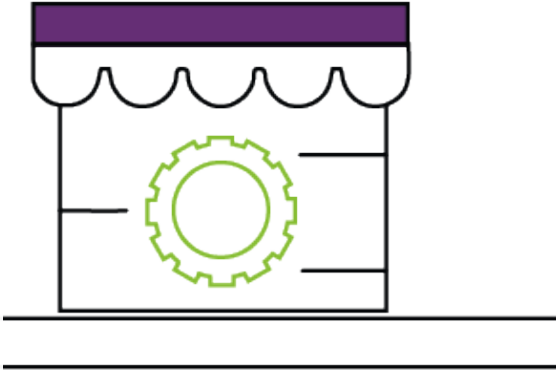
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## Processing

# Processing Technologies for Tomatoes



## The Context

**Wastage is high in tomatoes.** Often the 'Grade C' tomatoes (tomatoes sent to food processing centres\ for making juices, pulps, pickles, etc.) lack a market to be sold or they are sold at meagre rates. Coupled with other factors such as lack of storage or logistics constraints, farmers do not consider processing these unsold 'Grade C' tomatoes. **There is immense scope for value addition of these types of tomatoes which are not sold in markets due to merger market prices during the seasons. A sustainable source of energy is required to be integrated across the processing activities for tomatoes.**



## The Solution

Drying or dewatering is a simple process of excess water/moisture removal from a natural or industrial product in order to reach the standard specification of moisture content. It is an energy-intensive operation. Currently, this is done through sun drying which typically takes 4 - 10 days in the sun for the process to be complete and is also labour-intensive. The use of solar dryers helps to eliminate the disadvantages occurring in open sun drying. Drying can be done faster and in a controlled fashion. In addition, a better-quality product is obtained. Solar dryers can dry tomatoes much faster that is within 1-2 days. It can achieve higher food drying temperature, control airflow and temperature, and keeps food protected while drying.



## The Impact

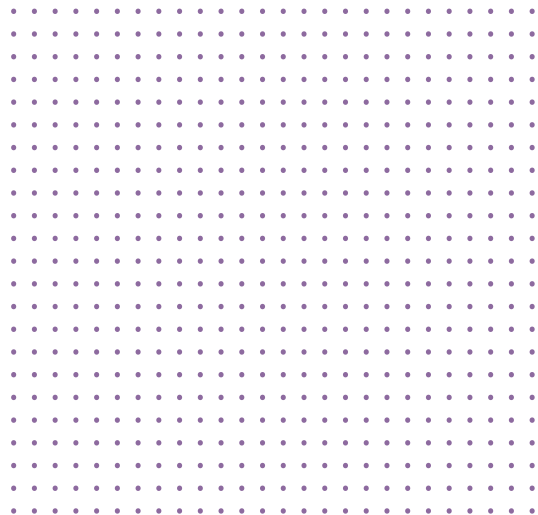
- **Reduce drudgery:** The use of solar dryers eliminates the need to dry tomato slices in the sun manually thereby increasing productivity.
- **Time-saving:** As stated above, compared to sun drying solar drying is a much faster process which saves a considerable amount of time in drying per batch of tomatoes.
- **Improved quality:** Solar dryers achieve a higher temperature which can be further controlled by the proper airflow protecting the product while drying. The dryer eliminates any mould formation that can occur in sun drying methods besides ensuring even drying of tomatoes. Therefore, the dried product is of greater quality and has a higher nutritious value.
- **Value addition and enhanced incomes:** The solar drying of tomatoes cuts down on product wastage and adds value to the 'Grade C' type of tomatoes which can be used as inputs for a variety of allied value chains thereby expanding incomes.
- **Replicability:** The solution is highly replicable and can be adopted across various ownership models – SHGs, FPOs, micro-entrepreneurs and small-scale food processing units across geographies.



## Contact

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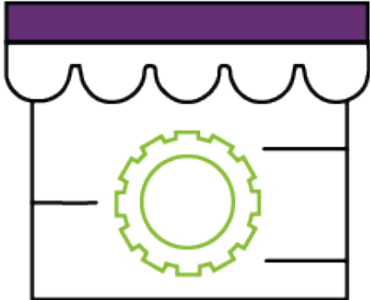
## Success Story

*Mamtha Sosaya Sanga* is a Self-Help Group (SHG) located at Honnashettihalli, Kolar district in Karnataka. It consists of a group of 20 women who are involved in the production of a variety of pickles, tomato flakes, tomato juice and protein powder. Prior to the intervention, the members of the SHG sliced tomatoes manually and this procedure was time-consuming. Further, they would use the sunlight for drying the tomatoes manually in the open areas and used old-fashioned methods to do so i.e., sliced tomatoes were placed on towels and dried in the open for long durations. With issues of manual labour coupled with the time invested in carrying out the activities made the whole procedure of drying tomatoes very tiresome.

A cabinet-type solar dryer along with a conduction solar dryer, a juicer and a slicer was installed. The solar slicer reduced the toil involved in the manual slicing of tomatoes. During drying one or two women would have to sit and guard the tomatoes from animals, birds or pests while subjected to heat stress in the open. With the installation of the dryer the need for the safeguarding of tomatoes has been completely eliminated. Thereby, the combination of slicer and dryer substantially reduced the drudgery involved in slicing and drying. The implementation of a solar slicer reduced the time involved in slicing 10 kg of tomatoes from 3 - 4 hours to 30 min. Regarding the drying of tomatoes, it previously took 4 days to 1 week to get adequate tomato flakes with the condition that there is intense sunlight. Currently, it takes 1 or 2 days to obtain good tomato flakes under moderate to bright sunlight. The slicer produced uniform tomato slices of any required thickness contrary to the uneven slices produced due to human error involved in manual slicing.

The value-added tomato flakes capture a value much higher than the value of raw tomatoes, which would cost Rs. 8 - 10 per kg and would exponentially increase the value via value addition to Rs. 60 - 80. Subsequently, 1 kg of dried tomatoes which previously (with the old method of drying) was sold at Rs. 400 now can be sold for Rs. 600-800 after being processed by the solar dryer due to improved quality and hygiene standards.





## Processing

# Solar-powered potato chips making



## The Context

**Chips are one of the most popular types of snacks consumed in India.** They have a very large market and can be purchased from a wide range of retail establishments. Peeling and slicing – a major part of the chip-making process – is mostly undertaken manually. Rural entrepreneurs are often unaware of chip-slicing technology. In some cases, small-scale entrepreneurs interested in purchasing machines lack access to energy. Manual chip production is a time-consuming and laborious process, and demands are unmet even when electric machines are used due to irregular power supply, posing risks of operational mishaps.



## The Solution

SELCO Foundation developed a solar-powered potato peeler and slicer that runs on DC motors. It can process 250 - 300 kg per hour. Entrepreneurs can work continuously and meet their demands, without relying on electricity, and increase production while reducing drudgery.



## The Impact

- **Reduce drudgery:** The combined use of the potato peeler and slicer eliminates the need to do the process manually, significantly reducing the required labour and increasing productivity. This also reduces the chances of getting injuries via cutting and peeling of the raw potatoes.
- **Time-saving:** Mechanisation in peeling and slicing activities drastically reduces the time involved when done manually. This saves time for the entrepreneur which can be used to perform other productive tasks.
- **Improved quality:** The employment of solar-powered potato peelers and slicers produce a greater quality of inputs in the form of evenly cut potatoes for the chip-making activity. It also reduces wastage that takes place during manual peeling and slicing.
- **Replicability:** The innovation is highly replicable and can be adopted across various ownership models - SHGs, FPOs, micro-entrepreneurs and small-scale food processing units across geographies.



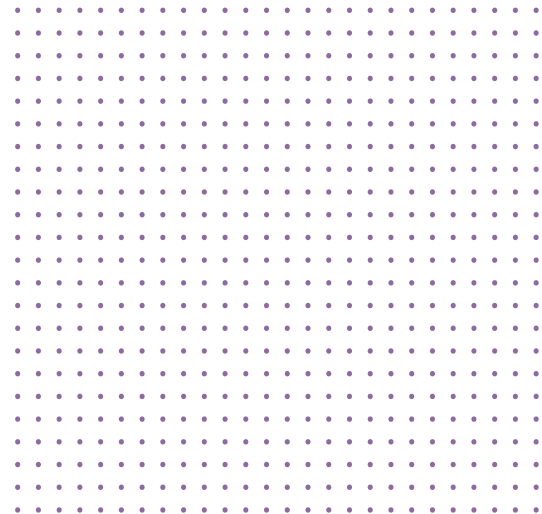


## Contact

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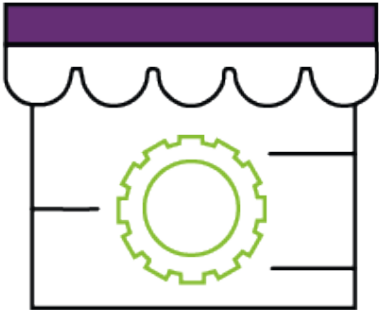


## Success Story

Mr. Muniraju is a small-scale entrepreneur from Konaghatta village, Doddaballapur in Bengaluru. He is the sole earner in the family of 9 members and has been practising chips making alongside other snack items as his primary business for the last 15 years. Prior to the intervention, he performed most tasks manually. Peeling and slicing by hand exposed him to occupational hazards, like cuts and bruises on his hands. Such manual operations had also taken a toll on his productivity which had reduced over the years. Considering all these factors, Mr. Muniraju wanted to mechanize the process. Although he sought to upgrade the process through technology intervention, he faced challenges like huge electricity bills and irregular power supply that negatively affected his productivity.

As part of the livelihood solution, SELCO Foundation assisted in the installation of a solar-powered potato peeler and slicing machine at his unit, whose original production capacity is 500 kg per day. As the system works independently of grid power, Mr. Muniraju was able to immediately realise an increase in his daily production which currently stands at 100-150 kg of potato chips per day compared to 40-50 kg per day when performed manually. Additionally, the end-user was also able to use the solar-powered system to slice and peel bananas giving an additional boost to his overall income. Therefore, mechanized operations and round-the-clock energy availability have resulted in outcomes like improved health and well-being, better socio-economic status and increased productive capacity of the business, ensuring long-term livelihood security.





# Collective Output Marketing



## The Context

**Tomato is the major crop grown by farmers in the Madanapalle cluster of Andhra Pradesh. These farmers face multiple challenges such as highly volatile prices, low shelf-life, the presence of middlemen for marketing and high commission rates (10 %) in the Agricultural Produce Marketing Committees (APMC).** Even though there is an open auction in the APMC; it takes place through the commission agents, middlemen and buyers. Furthermore, the transport of tomatoes to the APMC is one of the major challenges to farmers in the peak season (May to July) due to heavy rains.

In this context, it is difficult for farmers to fetch remunerative prices for their produces. To address these challenges and to increase the profitability of farmers, APMAS promoted eight Farmer Producer Organisations (FPOs) to take up tomato value chain interventions in the Madanapalle cluster of Andhra Pradesh.

During the COVID-19 pandemic, the prices of tomatoes, vegetables and fruits have crashed due to heavy restrictions on mobility and a lack of transportation. The traders stopped attending open auctions due to fear of contracting the virus and distant markets were closed. Consequently, the farmers stopped harvesting the crop in the field as they were not able to meet the costs of harvesting and transportation.



## The Solution

The aggregation of the produces was deemed to be the best solution to address the common challenges of the farmers. Consequently, collective marketing through FPOs was initiated already in 2018. APMAS facilitated market linkages for the FPOs with key players, i. e. retail chains and processing industries. The FPOs established linkages with Bigbasket, More, Metro Cash & Carry, Ninjacart, Azista, Foods and Inn, etc. to sell their produce and thus eliminating middlemen and benefiting their member farmers.

APMAS organised a series of trainings and exposure visits to the FPO Board of Directors (BoD) and FPO CEOs to build their capacities on business development, especially collective marketing of output. Special focus was laid on getting women BoD and women farmers involved in output marketing activities. Gradually, the participation and ownership of the BoD in carrying out the business activities increased which was a significant step towards the sustainability of the business.

The Department of Horticulture, Government of Andhra Pradesh, supported the FPOs in purchasing five transport vehicles with a 75 % subsidy (total worth Rs. 1,400,000) to five FPOs which helped reduce the transportation cost thus increasing the profit for members and the FPO. The marketing activities were upscaled with the growth of the FPO.

The disruption caused by the COVID-19 pandemic resulted in farmers leaving their crops unharvested as the markets were shut down. On the other hand, there was a limited supply of fruits and vegetables to consumers which drove the prices high. In this context, the District Collector of the Chittoor district instructed the FPOs to procure fruits and vegetables from the farmers and sell them in ] major towns of the district.



At the same time, APMAS contacted the district and state officials - District Collector, Agriculture Marketing Commissioner, Principal Secretary – Agriculture Marketing and Cooperation, Horticulture officials to scale up the relief activities. The processing industries were instructed to support the tomato farmers. As a result, three processing companies came forward to purchase the tomatoes from the project FPOs (Sunsip Agro-processing Industries, Srinivasapuram of Karnataka, Food & Inns processing industries, Jain Farm Fresh processing industries of Chittoor, Andhra Pradesh). Through institutional ties up with processing companies the farmers got better prices. This initiative helped the farmers to cover the input costs and further reduce losses. These tie-ups even remained after the pandemic



## The Impact

The entire collective marketing process was anchored by M-Tomato FPC Ltd. with the support of the APMAS team. The following table depicts the outreach of the collective marketing activities so far.

Sl. No.	Name of vegetables	Type of buyer	Qty. sold (in tons)	No. of farmers benefited
1	Tomatoes	Processing Industries	4150.00	<b>1085</b>
2	Other Fruits & Vegetables	Processing Industries	1932.35	<b>527</b>
3	Fruits & Vegetables	Aurobindo Pharma Foundation	43.69	<b>75</b>
4	Fruits & Vegetables	Retailers and Wholesalers like Bigbasket, Metro, Ninjacart, etc.	852.00	<b>382</b>
	<b>Total</b>		<b>6978.04</b>	<b>2069</b>

## Outcomes:

- A total of 2069 farmer families benefited from output marketing of FPOs
- Confidence in FPOs among the farmers has increased which further increased the membership
- The FPOs got recognition from Government and other private corporate companies
- The turnover of the FPO has increased
- The business development skills of the BoD and CEO improved due to the hands-on experience they have gained through market linkages and marketing activities



## Contact

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Mobile No.9440800622

## Success Story

P.Ananda Reddy S/o P.Reddeppa Reddy is a 42-year-old farmer from Nagappanayuni Buruju, Nimmanapalli. He is a shareholder of Nimmanapalli Farmer Producer Company Ltd. and lives in a joint family with nine other members including four children.

He has six acres of land in which he cultivates different vegetables, particularly tomatoes. During the COVID-19 pandemic, he cultivated tomatoes on two acres of land. He spent around Rs.150,000 towards the cost of cultivation. Unfortunately, the first harvest coincided with the first wave of COVID-19 and the subsequent lockdown.

There was no transport facility to market his produce and Ananda Reddy's family was distressed. At that point, APMAS discussed with the processing industries and convinced them to purchase tomatoes from the farmers through FPOs. Nimmanapalli FPC purchased tomatoes from the farmers and sold them to the processing companies. The FPC purchased 25 tons of tomatoes from Ananda Reddy and paid Rs. 87,500 in one month. With this support, Ananda Reddy's family withstood the impact of the pandemic.











# Women Entrepreneurship Programme: A mini-MBA for Rural Women



## The Challenge

**In India, women's workforce participation has declined to an all-time low of 25.3 %.** Women are not taking up low-paying jobs and do not possess the skills required for high-income employment opportunities. Entrepreneurship is traditionally not considered a viable option for women, especially in the rural context. Fully functional sector-specific entrepreneurship models can break the cycle of poverty in rural India.

The biggest roadblock for rural and tribal women to develop into entrepreneurs is that high-quality entrepreneurial and managerial education is currently accessible only to privileged groups in India, i.e., the urban, economically and socially privileged groups. No models provide marginalised rural women with the same level of training or have a long-term holistic engagement with the participants. Even the limited training or skilling programs designed for rural and tribal women are short-term and limited efficacy.



## The Solution

The Women Entrepreneurship Programme (WEP) is a mini-MBA that has been designed with an immense belief in the capabilities and inherent skills of rural women. In the first two phases of the programme, 200 participants from 7 locations across Telangana, Maharashtra, Odisha, and Uttar Pradesh, were selected to be imparted managerial and leadership skills. In the third cohort, with the support of the Green Innovation Centre project, 344 women across four locations will complete the program by March 2023. Following the six-month training the participants will be provided with incubation support for three months. The vision of the programme is to scale up to 10,000 rural women in 3 phases in the next 5 years.

Women imparted with these entrepreneurial skills are expected to become role models at two levels – start-up enterprises helping their household income multiply three times or taking up key jobs in local enterprises. The programme is built on the experiential learning framework, with 75 % of time spent on structured practicum exercises covering foundational managerial concepts and 25 % of the time allocated for classroom-based learning. The curriculum is structured around four pillars – Self-Transformation, Enterprise Skills, Enterprise Mindsets & Enterprise Excellence.

The programme offers a blended learning approach. Participants were given smartphones at a subsidised rate by Access Livelihoods Group. Through GIZ support Chitrika created a learning management system, where participants can access learning material extra reading materials, submit assignments, can track their progress, and connect with different stakeholders through one platform.



## The Impact

Around 69 % of participants have successfully started their own nano or micro-enterprises. The enterprises are of scale between Rs. 100,000 – 500,000 turnover annually.

11 % of trainees are taking up roles in enterprises with monthly incomes between Rs. 5,000 – 10,000.

Participants feel much more confident about entrepreneurship, marketing, and dealing with customers and vendors.

## Contact

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Contact Number: +91-99663-20734

Sruthi Kunnel, CEO,

Access Livelihoods Learning Foundation

# Success Story

## MBS Group – Mahua Laddoo

Mahua Laddoo is an initiative by 15 women participants from the tribal region of Gondia, Maharashtra. During the programme, they learned that value addition to one of the major local produce, Mahua, can result in good profits.

The Mahua flower is one of the significant non-timber forest produces from the jungle of Gondia. Almost all tribals collect the flowers during March and April. It is sold at Rs. 30 - 40 per kg.

The tribes of Gondia explain many health benefits by making Mahua flowers a part of their daily diet. The products made from Mahua have a good market potential when introduced as healthy food options alternative to traditional sweets.

During a 6-month training period, the founders of MBS enterprise started their market research by making 5 kg of Mahua Laddoos mixed with dry fruits and prepared in desi ghee.

They got good customer responses and started making more batches with improved recipes. To date, the women have sold 80 kg of Laddoos at Rs. 600 per kg rate which earned them a profit of Rs. 15,000. Within a span of two months, they reached 300 customers. The women also connected with healthy food brands in Pune and Nagpur, who are ready to buy the laddoos in bulk.









# Success Story

## Aarambh Foods

*Aarambh Foods* is an initiative by 11 women who came together to start something on their own. All of them hail from the Maval region, Pune. After trying out a couple of other business ideas during the practicum phase they realized that ragi, rice, and udad papad have a huge demand in nearby cities like Pune and Mumbai which are just 40 km and 100 km away respectively from their production location.

Papad is undoubtedly the most common food item consumed across all the regions in India. From a cup of evening tea to a wholesome feast, the papad is eaten as an accompaniment to various dishes. *Aarambh food* is established 20 km from major tourist-flooded regions; Lonavala and Khandala. Millions of people visit these places throughout the year. The founders identified the potential of this business in their area. They aspired to introduce the papad as a healthier alternative. Soon after their market research, they set up a small unit with a self-investment of Rs. 24,000 which generated a revenue of Rs. 126,000 and a net profit of Rs. 36,000 by selling 250 kg papad in Pune and nearby tourist locations.

They tried different marketing strategies like exhibitions, online marketing, social media, and door-to-door sales, which increased their outreach to 450 customers and additionally received bulk orders from supermarkets and wholesalers. As the business is taking off, *Aarambh Foods* registered the enterprise, applied for an FSSAI license, and finalised the godown for the production unit. They applied for a loan from Union bank and the PMFME scheme to raise the initial seed fund.









# Sustainable Partnerships



## The Context

APMAS promoted 8 Farmer Producer Organisations (FPOs) to take up tomato value-chain interventions towards increasing the productivity, production and income of small and marginal farmers in the Madanapalle cluster of Andhra Pradesh. To achieve this objective, various innovations were promoted across the value chain including tomato package of practices, model nurseries, and collective marketing of inputs and output.

To ensure that the farmers get the maximum benefit out of the project and the interventions, partnerships and collaborations were formed with government, academic and research institutions as well as key market players.



## The Solution

To achieve the objective of the Green Innovation Centre project, APMAS has been facilitating partnerships with public and private sector institutions for the benefit of FPOs and their members. The farmers needed support for input and output marketing, financial linkages, capacity building, new technology, etc. To address these needs, APMAS adopted a multi-pronged approach in which establishing partnerships with key players is a critical aspect.

In all the interventions and activities of the FPOs, linkages and partnerships became an integral part. Some of the key partnerships formed include tie-ups with the Department of Horticulture, YSR Horticulture University, World Vegetable Centre, SELCO Foundation, APFPS, Samunnati, eFresh agribusiness, Coromandel, Sri Padmavathi Mahila Viswa Vidyalaya, Bigbasket, More, Metro Cash & Carry, Sunsip, Foods & Inns, etc. These partnerships have immensely benefitted FPOs and thus their member farmers.



## The Impact

Thanks to the intensive efforts of APMAS, 9742 farmer families have been mobilized to form and join FPOs. The FPOs are working with 52 partners of the Government of AP, the Government of India and other private institutions through MoUs. The present partnerships are categorised into input & output marketing (with 22 partners), promotion and strengthening of FPOs (6 partners), human resources (1 partner), technology transfer (17 partners) and financial linkages (7 partners). The FPOs and their federation are utilising the services of partnerships for the benefit of their members.





## Contact

### Registered office:

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[www.apmas.org](http://www.apmas.org) / [www.sadhikaratha.org](http://www.sadhikaratha.org)

### Field office for GIC project:

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Annamayya District, Andhra Pradesh

Mobile No.9440800622

# Success Story

In collaboration with eFresh Agri Business Solutions, Hyderabad, all the FPOs have established Farmer Development Centres (FDCs). The FDCs have a software to record and track the daily financial transactions, issue receipts and prepare financial statements easily.

All FPOs including M-tomato Federation installed the eFresh software. The FPO can get the financial details (day wise, month-wise, product-wise, total sales, total receipts, number of customers, financial statements, etc.) with a single click.

The following picture depicts the dashboard of eFresh software.

The screenshot displays the eFresh software dashboard for M-Tomato FPC Ltd. The interface includes a navigation menu on the left, a top header with language options (English, Telugu, Hindi) and user information, and a main content area with various financial metrics and due date tables.

**Language:** English, Telugu, Hindi

**User:** M-Tomato FPC Ltd | 23-12-2022 | Sign Out

**Welcome eFresh**

**Date Range:**

Start Date:  End Date:

**Financial Summary:**

- TOTAL PURCHASES AMOUNT: ₹ 2564066.40
- TOTAL SALE AMOUNT: ₹ 1170191.81
- TOTAL STOCK TRANSFERRED: ₹ 0.00
- TOTAL STOCK RECEIVED: ₹ 0.00
- TOTAL EXPENSES AMOUNT: ₹ 0.00
- TOTAL PAYABLE AMOUNT: ₹ 404064.00
- TRADE RECEIVABLES: ₹ 1052027.50

**GST FILING DUE DATES**

Name	Date	Action
GSTR-1	GSTR-1 Due Date 11th of following Month	<input type="button" value="Filed"/>
GSTR-3B	GSTR-3B Due Date 20th of following Month	<input type="button" value="Filed"/>

**TDS DUE DATES**

Name	Date	Action
1st Quarter	1st APRIL TO 30th JUNE, Due Date - 31st JULY, 2022	<input type="button" value="Filed"/>
2nd Quarter	1st JULY TO 30th SEPTEMBER, Due Date - 31st OCTOBER, 2022	<input type="button" value="Filed"/>
3rd Quarter	1st OCTOBER TO 31st DECEMBER, Due Date - 31st JAN, 2022	<input type="button" value="Filed"/>

## Driving Digital Transformation For Farmer Organizations

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# Breaking the Chain: A multi-sector approach to address malnutrition in Maharashtra



## The Context

**The impact of the COVID-19 pandemic will be long-term, affecting intergenerational malnutrition and poverty. The long-term factors that affect children's growth, immunity, and cognitive development in the first 1000 days of life and help break the intergenerational cycle of malnutrition and poverty, must be addressed together with poverty reduction initiatives.**

Thus, in addition to nutrition-specific interventions that address the immediate causes of undernutrition, an important focus must be on nutrition-sensitive interventions that draw on complementary sectors such as agriculture, home-based care and childcare, early childhood development, and water, sanitation and hygiene (WASH) practices. These will impact the underlying determinants of undernutrition – including poverty, food insecurity, poor childcare practices, lack of adequate health and care resources, and unavailability of clean water and sanitation. In addition, a multi-sectoral approach is needed to address malnutrition and hunger that focuses on empowering the communities to claim entitlements and influence government development plans and budgets at the local level.

To sustain efforts to empower the communities, build capacity among service providers and improve knowledge about good nutrition and hygiene, networking with aid organisations and lobbying government agencies is a fruitful strategic approach that Welthungerhilfe and its partners have demonstrated in recent years.





## The Solution

### Two Core Activities :

- **Capacity development of frontline workers** under the Maharashtra State Rural Livelihood Mission (MSRLM) and the Integrated Child Development Services (ICDS) Administration who will in turn train Self-help group (SHG) members and other beneficiaries through the Prior Learning Assessment (PLA) process.
- **Advocacy for multi-stakeholder convergence** to sustain and increase the achieved nutritional behavioural changes and improvements, the project will promote integration and convergence of the measures related to food and nutrition with other government development programmes.





## The Impact

Target group: 100 villages in 2 districts of Aurangabad (Sillod and Soygaon) and Ahmednagar (Jamkhed)

Numbers reached:

- Total farmers reached: **9670 (all women)**
- Mobilised government funds through schemes for 159 farmers worth **Rs. 13,000,000**
- Farmers training on agriculture inputs and practices (pre-sowing, Bio fertiliser and pesticides): **1113**
- Total youth and women entrepreneurs trained in nutri-business: **228**
- Women engaged in agro-business development (bio pesticides and fertiliser, vegetable sale): **373**
- Participation in Nutrition Sensitive micro-planning (village assembly planning): **1113 people**

## Contact

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Welthungerhilfe

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## Success Story

### Sanjivini

Living in a tiny house, Sanjivini was encouraged by WHH and #swayamsikshamprayog to initiate kitchen farming in her backyard and fulfil her family's dietary diversification by growing nutritional vegetables like brinjal and gourds, and fruits like pomegranate and papaya. "I do not have to purchase the same from the market at higher prices. The money saved is invested in my business."

She came forward to be groomed as an entrepreneur starting a small-scale business to sell sanitary napkins, hygiene products to women and adolescent girls who could not openly purchase them because of stigma. Every month she expands her product sales ranging from organic pesticide spray to vermicompost bed.







**and GREEN COLLEGE PROGRAMME PARTNERS**





# Fast Track Programme



## The Context

**With an average age of 28 years, India has the youngest population in the World.** Most of these young people reside in rural India and are as aspirational as their urban counterparts. In India, there are several agri-allied skilling programmes for rural youth, which result in nano enterprises being established. These programmes also see the emergence of high-potential rural youth, i.e. programme participants who can establish higher-level rural enterprises that employ a few persons and positively impact local value chains. However, there is a need for a rural enterprise acceleration (business incubation) programme that helps such high-potential youth to establish their enterprises and enable them to realise their potential.

## Success Story

### Umadevi, Chitradurga

“After I was identified as an HPRY, I received a training on ‘Preparation of Business Plan and Media and Communication skills’. Through the training, I learned a lot about packaging and branding. I also gathered the confidence to talk to shop owners which helped to increase my customers. I also sell my products during our local village festivals. Now, I sell the tamarind chutney bottled and labelled under my own name. I also consciously seek feedback from my customers to make my product better.”



## Sachitananda, Wardha

“I am running a cold press oil mill. I started my business on 3rd September 2021. I started my business after the first Fast Track Innovation Camp. Initially, my turnover was around Rs. 30,000, which more than doubled in one year. Later, there was the media and communication training, from which I learned how to talk with people about my business. After that, the last network meeting took place. There I learned how to talk to our main stakeholders, how to talk about my business in short. By applying the same process with the bank, I also got a loan for my business. This programme has been of great benefit to me”.





and GREEN COLLEGE PROGRAMME PARTNERS



# FPO Manual for Board of Directors



## The Context

The core team of Farmer Producer Organisations (FPOs) – members, directors, CEOs as well as stakeholders – as well as the promoting organisation team and government officials, require **regular, need-based capacity building**. Existing capacity-building models focussed on the transfer of knowledge and information and were content-heavy and there was no manual that addressed the need for developing competency to deal with practical situations faced by FPOs. The other major problem, considering FPOs that were located in Tier-II and Tier-III towns, was the lack of local trainers to address the need for regular and high-quality capacity building at affordable costs, which cannot be met by a few experts in major cities across the country.





## The Solution

The solution consists of developing a trainers' guide explaining participatory processes for capacity building for various competencies required by those involved in the functioning of FPOs. The trainers' guide is an open-source manual which is freely available to any trainer who wants to use it in the training of FPOs. A pool of FPO trainers across the country is developed through the training of trainers (ToT) approach in which the participants get hands-on practice using the trainer's guide. The trainers then facilitate the training of FPOs in their own rural locations.



## The Impact

One training guide for the capacity building of directors was developed under the GIC project. Based on the experience, after the project, Skillgreen Global worked further on developing more training guides. By now, 11 training guides – 5 basic manuals for Directors, CEO, finance professionals and state agencies working with FPOs and 6 advanced thematic manuals - Entrepreneurial approach, Understanding Markets, Supporting Farmers for Production, Finance Planning and Management, Understanding People and Business Planning have been developed. 17 ToTs have been conducted for 407 trainers across 15 states. These trainers have trained an estimated 2500 directors from nearly 500 FPOs across the country.

## Contact

### **Parthasarathy.T**

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## Success Story

### **Sai Satya Narayana, Vijayavahini Charitable Foundation (affiliated with Tata Trusts)**

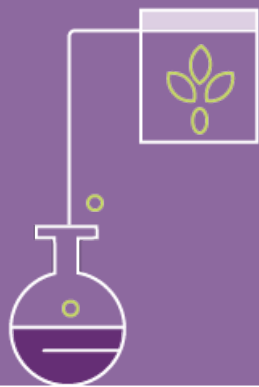
“It was through the ToT organised by Skillgreen in November 2019 that I first understood the concept and importance of facilitation and participatory training methodologies. Until then, most training sessions I had attended followed a one-way communication methodology.

The Skillgreen team supported the FPOs that we work with by sending their trainers to co-facilitate training sessions. These sessions provided clarity to the FPO BoD members on their roles and responsibilities. Another important service provided by the Skillgreen team was to conduct a profitability analysis for each transaction that the FPOs carry out. This helped to improve their operational efficiency.

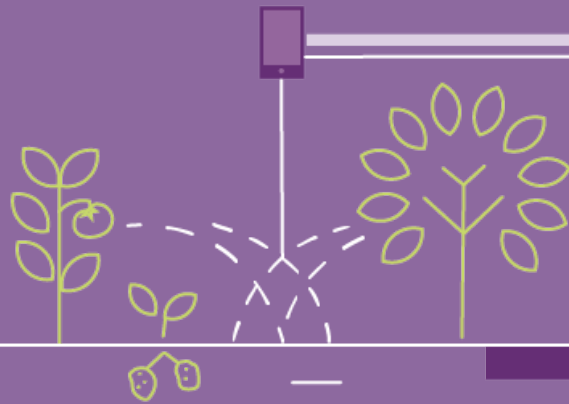
As a combination of all these efforts, in the financial year 2020-21, the Chintapalle FPO was able to carry out a turnover of Rs. 5,000,000. The FPO staff and the BoD members had gained the confidence to be able to carry out the operations with minimal assistance from external stakeholders.”



Good-quality inputs



Irrigation



Sustainable  
Production





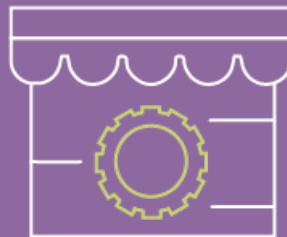
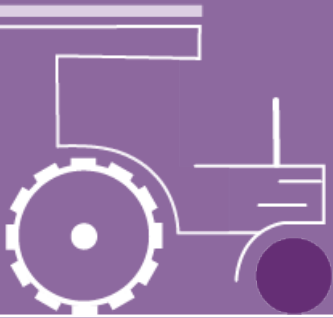
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