



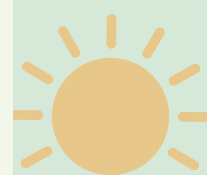
Impact Evaluation of CSR Intervention in **Agriculture and Horticulture**

Report by NuSocia | April 2023



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ABBREVIATIONS

APMC	Agricultural Produce Market Communities
CSMCRI	Central Salt and Marine Chemicals Research Institute
DAY – NRLM	Deendayal Antyodaya Yojana - National Rural Livelihoods Mission
FGD	Focus Group Discussion
FPO	Farmer Producer Organization
GLPC	Gujarat Livelihood Promotion Company Limited
GU - IIS	Gujarat University - Indian Institute of Sustainability
ICCSIR	Indian Centre for Climate and Societal Impact Research
IPNM	Integrated Pest and Nutrient Management
JAU	Junagadh Agricultural University
KAP	Knowledge, Attitude and Practices
KII	Key Informant Interview
NHRDF	National Horticultural Research and Development Foundation
NRCSS	National Research Centre for Seed Spices
OECD-DAC	The Organization for Economic Cooperation and Development - Development Assistance Committee of the
R&D	Research and Development
SHG	Self Help Groups
SPNF	Subhash Palekar Natural Farming
TIFAC	Technology Information Forecasting and Assessment Council
VO	Village Organization

EXECUTIVE SUMMARY

The following report gives a detailed account of the impact evaluation carried out for the CSR intervention in Agriculture and Horticulture carried out at the Center for Agriculture-Horticulture Development, Manar based in Talaja block of Bhavnagar district, Gujarat. The project has been implemented as a collaboration between Pidilite Industries Limited and the Department of Agriculture and Cooperation Government of Gujarat since 2017.

The assessment has followed a mixed methodology by using quantitative research methods through stratified sampling and qualitative research methods through convenience sampling. The research tool created using these methods followed the Knowledge, Attitude and Practices framework. Through the quantitative research the study reach out to 102 beneficiary farmers and 29 beneficiary SHG members. Through the qualitative research the NuSocia research team conducted 24 key informant interviews (KII) with the Pidilite CSR team, Center's team and the representatives from the collaborating institutions. The qualitative research also covered 10 focus group discussions (FGD) with the farmers and SHGs involved in the different activities. The findings section of the report is presented in 3 key areas -

- i. Program design
- ii. Program reach and impacts
- iii. Impact areas of the Manar Center

The evaluation was done on the OECD-DAC REECIS framework, which highlights the impact in the themes of Relevance, Effectiveness, Efficiency, Coherence, Impact and Sustainability. The intervention was found highly relevant as it takes action on the vital agricultural challenges faced in the region through a knowledge and capacity building approach. This intervention imparted delivered this approach by incorporating oral and visual teaching methods which made the learning engaging for the beneficiaries. The practical examples given through the demonstration plots has been particularly effective. The intervention's wide outreach is a result of having local people for mobilization which helped in trust building process with the community. Other factors such as collaborations with reputed organizations and convergence with government schemes are also indicators of the intervention's success. Lastly, the evaluation finds that the CSR intervention has been successful in addressing the agriculture and horticulture issues through the introduction of new agri-horticulture techniques and practices. It has also been successful in the creation of SHGs through which women of the local communities are getting an opportunity to earn income and learn new skills for the post harvest activities. The report concludes with a few recommendations basis the findings and observations.

1. INTRODUCTION

1.1. Background

Agriculture plays a vital role in the Indian economy, providing livelihoods to millions of people and contributing significantly to the country's Gross Domestic Product (GDP). However, the sector faces a range of challenges that limit its growth and development. For instance, limited access to resources (e.g. inputs, credits), inadequate infrastructure, and a lack of technical knowledge and skills among farmers have all been identified as major challenges that impede agriculture's potential.

According to the latest data from the Ministry of Agriculture and Farmers' Welfare, the contribution of agriculture and allied sectors to India's GDP has declined from 18.5% in 2011-12 to 16.5% in 2019-20. The agricultural sector has also been hit hard by the COVID-19 pandemic, with farmers facing disruptions in the supply chain, labour shortages, and reduced demand for their produce.

The state of Gujarat is one of the leading agricultural states in India, with a diverse range of crops and a favourable climate. The state ranks third in India in terms of the total value of agricultural output and accounts for 44.48% and 23.98% of India's total groundnut and cotton production respectively¹. However, the sector faces similar challenges in Gujarat, with limited access to resources and a lack of technical knowledge and skills among farmers.

According to a report by the National Bank for Agriculture and Rural Development (NABARD), only 30% of farmers in India have access to formal credit, while the rest rely on informal sources of finance, which are often expensive and unreliable. Additionally, only 10% of Indian farmers use modern technologies, such as high-yielding seeds and efficient irrigation systems, which can significantly improve productivity.

Pidilite Industries is an Indian multinational company that is primarily involved in the manufacture of adhesives, sealants, and construction chemicals. The company is headquartered in Mumbai and has a presence in over 90 countries worldwide. In addition to its business activities, Pidilite Industries is also committed to social and environmental initiatives. Over the years, the company has been engaging in various social and community initiatives towards agriculture, animal husbandry, health, education, women empowerment, water conservation, etc. These initiatives, undertaken directly by the Company and through various organisations, are spread across the states of Gujarat, Maharashtra, Himachal Pradesh, and Rajasthan. The Manar Center is one such initiative of the Pidilite Industries to help empower various stakeholders of the farming communities and others through adopting resource conservation techniques in the state of Gujarat. Specifically, the Manar Center, has been recognized and awarded for 100 percent water saving and Conservation by GGRC Paragon India Limited.

Pidilite Industries' social initiatives reflect the company's commitment to creating value not only for its shareholders but also for the wider society and the environment. Through its programs, the company is helping to promote inclusive growth, education, and sustainability in India and beyond.

¹<https://www.indiabudget.gov.in/economicsurvey/doc/stat/tab118.pdf>

1.2 Program Background

The Center for Agriculture-Horticulture Development, Manar, referred to as Manar Center, is a collaboration between the Department of Agriculture and Cooperation Government of Gujarat and Pidilite Industries Limited. The Center is built on the land of Shree Gram Daxinamurti Heritage Trust which helps in running the Center.

The Center was established in the year 2017 to improve agricultural and horticultural practices in the Bhavnagar District. Through its various activities, the Center has been mobilising farmers, offering training, exposure visits, and field trips to make them aware of various natural farming techniques. Furthermore, the Center has begun seaweed cultivation and production techniques for the fishermen population and coastal farmers.

Further, the demonstration plots established at the Center assist farmers in witnessing and learning the application of farming techniques. The Center is a knowledge-sharing space for the community, students, and professionals, where they exchange information and training with farmers and women, as well as those who have attended training, and mobilise others to participate.

Through the Manar Center, the Pidilite Industries has continued to supply farmers with the most up-to-date suggested cultivation practices (already accessible from universities, the government, and other sources) to promote sustainable agriculture and horticulture growth, as well as the value addition to their output. The Center has successfully proven agricultural and horticultural procedures for aromatic fruit and medicinal crops. Farmers from 45 neighbouring villages came to the centre to learn about the finest agricultural practices and to expand their agricultural knowledge and technology. Since its creation, the Center has taught nearly 8,500 farmers, with a goal of training 5,300 farmers in 2021-22. The Center is now collaborating with farmers to develop high commercial value crops such as aromatic and medicinal crops, which will provide them with higher profits as well as an alternative crop for value addition. These crops can also be cultivated as intercrops in addition to standard crops. Farmers provided grass for the Center, which produced more than 350 litres of high-value oil from citronella, palmarosa, and lemongrass.

Low-cost technology and contemporary agricultural practices are demonstrated for farmers at the Center. In addition, the centre has created a hydroponics unit, Zero Gravity Israeli technology, mushroom (oyster) culture, and a Thai culinary garden. The key objective of establishing these new agricultural practices is to enable farmers to learn and adopt them in their fields, resulting in greater financial benefits. The Center has collaborated with many institutes, including the National Research Center on Seed Spices (NRCSS), to educate farmers in the development of diverse spice crops. In addition, the centre has worked with the Central Salt and Marine Chemicals Research Institute in Bhavnagar to assist coastal fishermen and farmers in cultivating seaweed as an alternative source of income. The Manar Center is currently teaching 80 such coastal fishermen and farmers.

Program Initiatives

The program has implemented multiple agriculture and horticulture-based initiatives which enables the farmers and SHG to have a higher earning capacity. The brief description is given in the Table 1 :

Agriculture & Horticulture	Upgradation of agriculture and horticulture activities through training. R&D, technical collaborations and introduction of new crops and farming practices
Farmer Producer Organisation (FPO)	Creation of FPOs for formalising the farmers and assist in getting better prices for their produce
Seaweed Cultivation	Development of technologies for the cultivation and processing of certain seaweed to create an additional source of income
SHG activities	37 SHGs with 390 women members were formed under the centre. Created the “MUH-WAH” brand under SHGs. Associated with Gujarat Livelihood Promotion Company Ltd (GLPC)

Table 1 : Key initiatives of the Manar Center

Vision ahead :

The Center has a vision to become a sustainable Center. There are plans to expand the categories of plants being introduced to the farmers, creation of forward linkages for the seed spice cultivations to tap into the international markets and more exposure visits to learn newer technologies. The Center has also received suggestions to explore cluster farming with new technology, high density horticultural development and Indo-Israeli technology development.

In order to understand the effectiveness of this initiative and to identify learnings for further improvements and scale up, the Pidilite Industries onboarded NuSocia to undertake this assessment study.

This report is presented in seven sections, including the background. Section 2 provides the assessment approach and data collection methods. Section 3 presents the assessment results. Key analysis and inferences based on the REECIS framework are discussed in section 4. Recommendations and directions for further improvements and conclusions are presented in section 5 and 6 respectively. Lastly, the reports ends with the annexure covered in section 7.

2.METHODOLOGY

This section explains the approach taken to understand impacts of initiatives implemented by the Center. The assessment was kicked off with a context-setting meeting where NuSocia (the assessment team) aligned on the approach, timeline, and methodology with the Pidilite team. This was followed by the introduction of the assessment team and the program implementation team to plan the on-ground logistics. The above planning was followed by desk research. The program literature, including reports, MIS, etc., was assessed to understand the program and its progress. NuSocia deployed a field team including local team members and undertook a primary research.



2.1 Approach

The objective of the study was broken down into themes, and these themes were further broken down into indicators. Each of the indicators was then mapped against appropriate research tools and respondents. A mixed-methods approach combining qualitative and quantitative research was used to conduct the assessment study. Each program objective was converted into a parameter as part of the research approach to understand the current impact of the objective of the program. The relevant research instruments were mapped. Research questions were defined in light of the identified tools.

The field research followed an appreciative inquiry approach and therefore involved qualitative research in the form of Focus Group Discussions and Key Informant Interviews, quantitative research in the form of a survey. The Pidilite team was updated weekly on the progress to ensure that the assessment was on track.

In addition, detailed secondary and desk research was also carried out. Sources including the Pidilite annual report 2021–2022, information documents, state economic surveys, Niti Aayog report, government portals published research papers, and websites of various institutions were analysed for extracting relevant information.

2.2 Sampling

A stratified sampling method was used to identify the beneficiary group for the quantitative research

through survey. A convenience sampling method was used to conduct the qualitative research through KIIs and FGDs. Table 2 gives details of the stakeholders included that were

Stakeholders	KII	FGD	Survey
<ul style="list-style-type: none"> Manar Team (Center Head Manar Center Field officers- (9) Intern Gram Daxinamurti, Director Pidilite Industries Limited, Senior Vice President - CSR & Special Projects 	13		
<ul style="list-style-type: none"> Government Departments, Educational Institutions and Partners Horticulture with whom MOU has signed. (District Administration, District Horticulture Department, Taluka Livelihood Department Gujarat University- Ex-Vice-Chancellor, 	11		
<ul style="list-style-type: none"> Junagadh University, Lokbharti University ICAR-NRCSS Indian Institute of Sustainability (IISc), International Maize and Wheat Improvement Center (CIMMYT), Mera Bioseed Mera Viswash, Vivekananda Research & Training Institute) 			
<ul style="list-style-type: none"> Women FGD (Fruitfly trap unit Khakhra unit, R&D unit and Seaweed cultivation group) 		4	
<ul style="list-style-type: none"> Farmers FGD (Agriculture, horticulture and spice farmers) 		6	
<ul style="list-style-type: none"> Survey 			131
Total	24	10	131

Table 2: Details of KIIs, Surveys and FGDs

2.3 Profile of survey respondents

During primary research, the team interacted with two main categories of beneficiary - farmers who have benefitted from the training programs at the Center, and the women who are members of the SHGs created by the Center. As a part of the research, 131 surveys were conducted among the beneficiary farmers and SHG members. Of the 131 survey respondents, 102 were beneficiary farmers involved in the multi-cropping practices, natural farming, horticulture and spices farming. The rest of the 29 respondents were women SHG members who are involved in the post harvest processing unit and income generating activities (aromatic candle making, fruit fly trap making).

a) Profile of beneficiary farmer respondents

The respondent farmers were between the age group of 18 to 75. The majority of them belong to the age group 35 to 50 years (37%) (Figure 1). Majority, 47%, of the surveyed farmers have attended higher secondary school. 41% of the respondents also hold bachelor's degrees. The respondent group is predominantly working in the agriculture sector with 97% of the respondents depending on farming as their source of income.

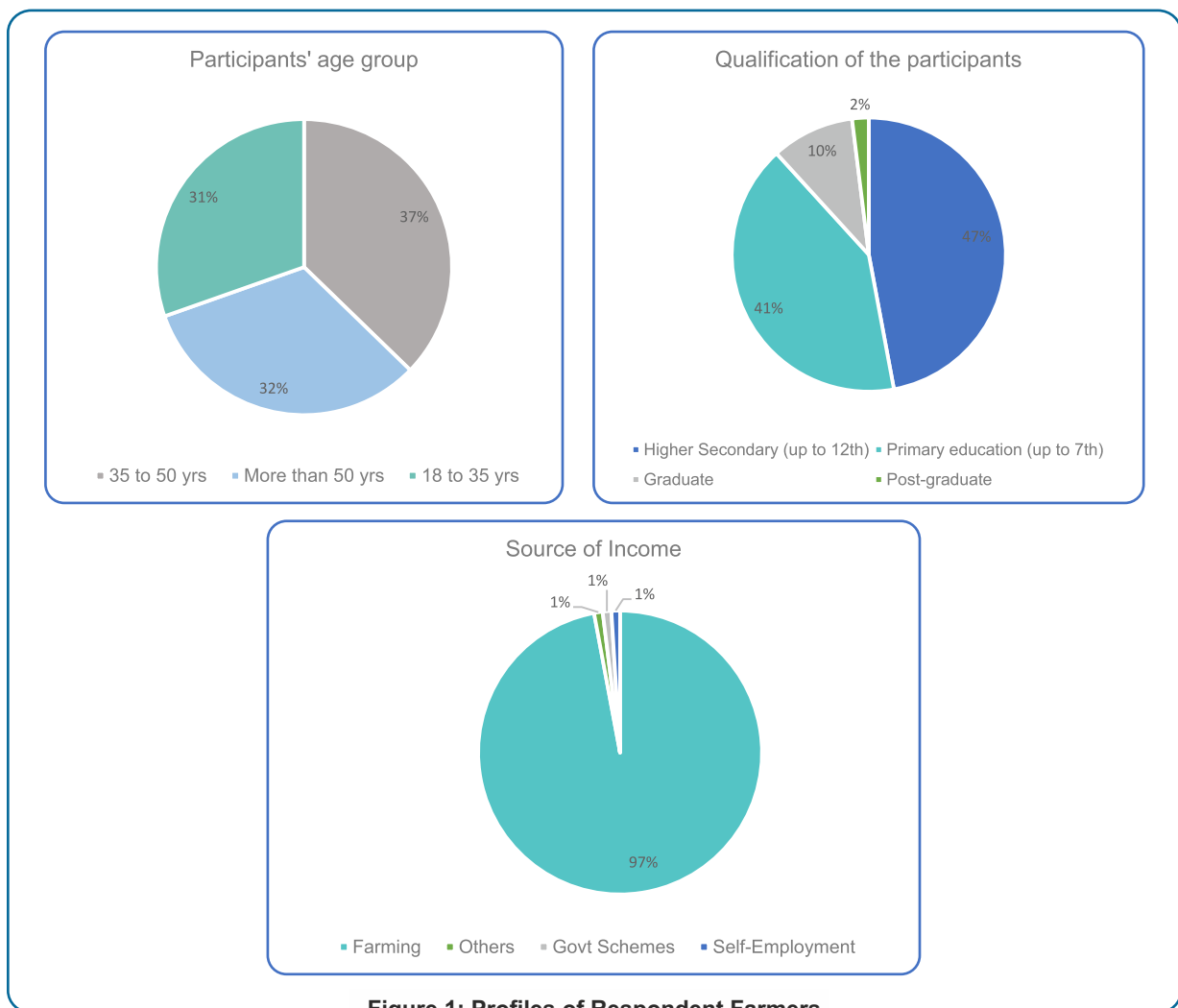


Figure 1: Profiles of Respondent Farmers

b) Profile of the SHG respondents

The respondent group of the SHG surveys saw an equal participation, 45%, from women belonging to the age group of 18-35 years and 35-30 years. Remaining respondents were below 18 years (3%) and above 50 years (7%) of age. Of the 29 respondents 8 (28%) of the respondents have never attended school And about half the respondents, (52%) have attended school till the primary education level. The women are engaged in various income generating works ranging from private jobs to farming related work or being self-employed. Majority of the respondents, 27% are engaged in self-employment and 14% respondents denoted SHG work as their source of income (Figure 2).

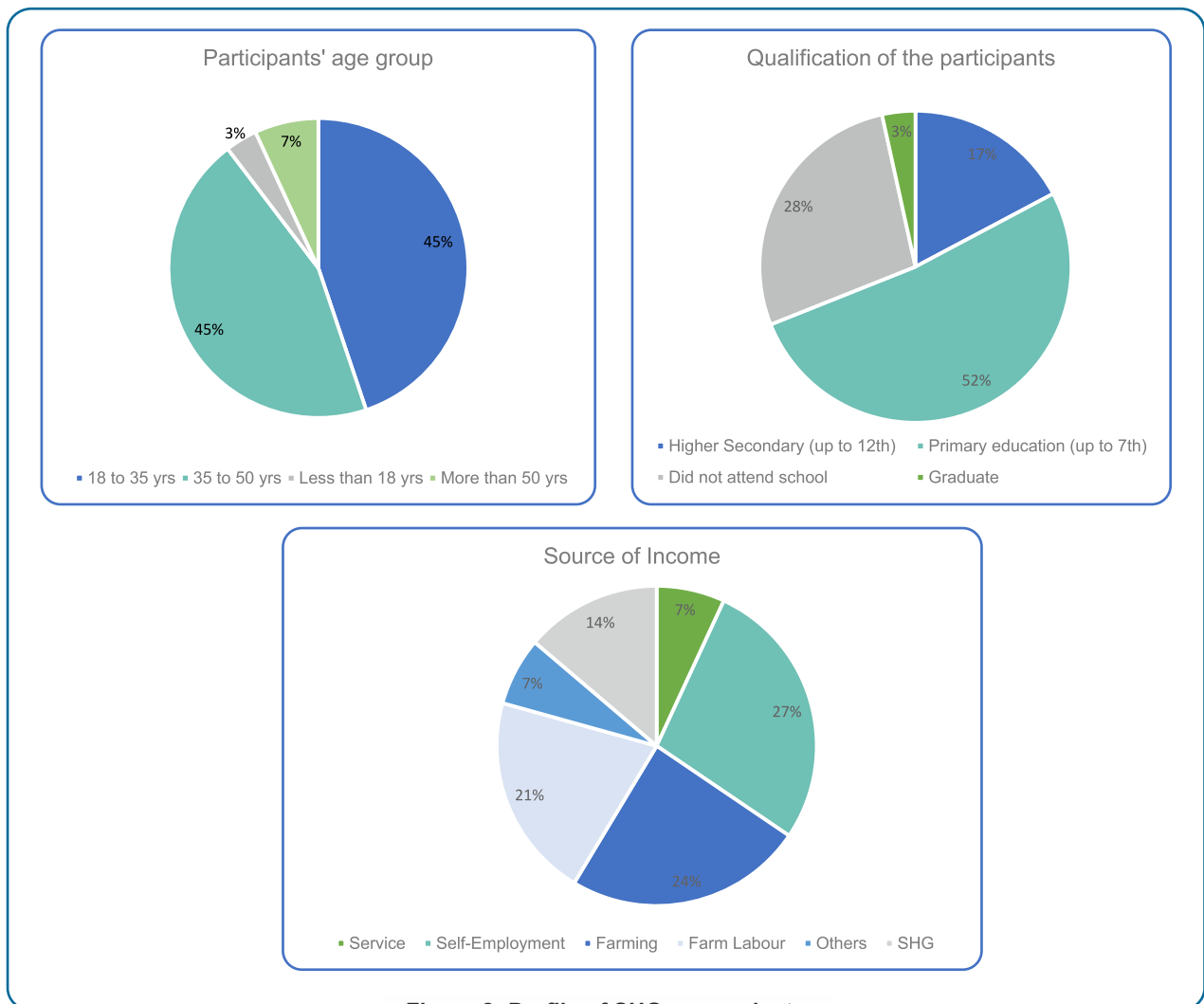


Figure 2: Profile of SHG respondents

2.4 Research Framework

The study makes use of two frameworks, namely the Knowledge, Attitude, and Practices (KAP) model and the REECIS evaluation framework by the Development Assistance Committee of the The Organization for Economic Cooperation and Development (OECD-DAC).

KAP Model

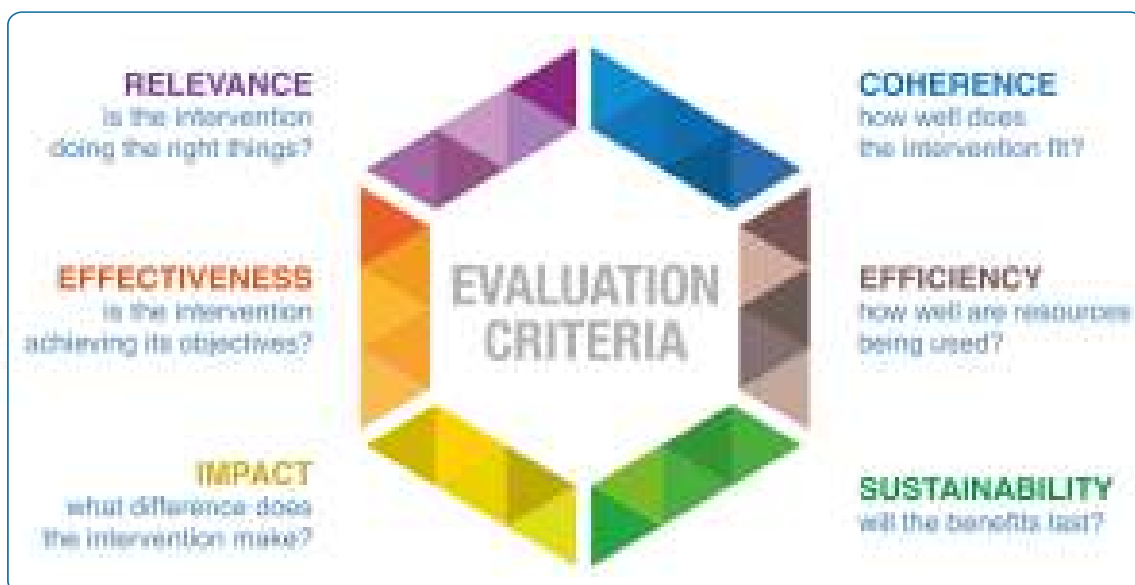
The KAP model provides access to quantitative and qualitative information. KAP reveals misconceptions or misunderstandings that may represent obstacles to the activities implemented and potential barriers to behaviour change. The model was mainly deployed while designing the research tools for the assessment.



The presentation of the Findings is done following the KAP model.

REECIS Framework

The evaluation of the program has been done through the six parameters of the REECIS framework.



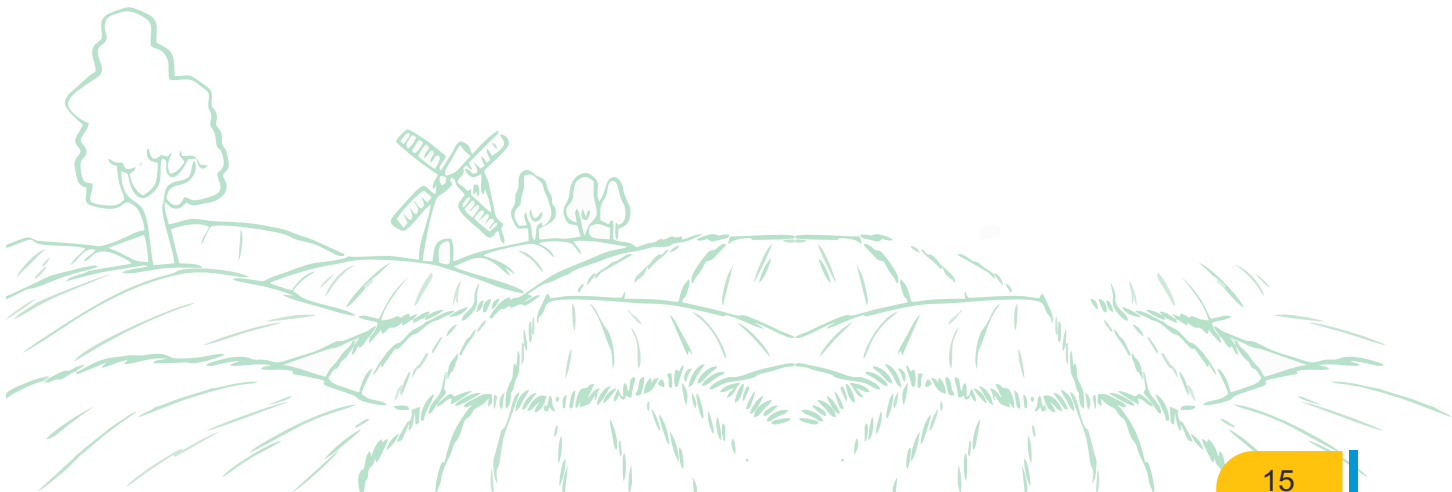
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²<https://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

The following indicators were identified to be the areas of assessment under the six parameters of the REECIS framework.

Dimensions	Areas to Check	Indicators
Relevance	Intervention need	To understand the geographical and community needs of the area
		Understand the importance of the intervention in the area
Coherence	Context of the program in a wider setting	Alignment with government institutions and departments
		Alignment with local implementation partners/NGOs
Effectiveness	Objectives, achievements, mission, vision, aim, goals, defined needs	To understand the objectives and vision of the interventions
		Achievements through the interventions
Efficiency	Justified use of resources and inputs	Budget vs Utilization
		Resource utilization
		Program level monitoring- at different levels
		HR deployment
Impact	Intended and unintended impacts of the program on direct and indirect beneficiaries	Awareness
		Knowledge sharing
		Change/ Improvement in the access to resources
		Improved awareness about government schemes

		Outcomes related to the personal and professional development of beneficiaries
Sustainability	Program future, good practices, and replicability	Adoption of the practices, methods and technologies
		Behavioural change
		Opportunities for collaboration
		Best Practices
		Sustainability of Outcomes
		Opportunities for improvement



3.FINDINGS

3.1. Program Design

This section highlights the vision behind the Manar Center and the processes which have been established to ensure its smooth functioning.

3.1.1 Purpose of the Manar Center

The Manar Center was started with the intention of addressing the prevailing issues in the areas of agriculture and horticulture. Some of the problems faced by farmers include barren land, erratic rainfall, water crisis, lack of awareness of different farming techniques, extensive usage of chemical fertilisers by small and marginal farmers, lack of awareness of natural farming, problem of wild animal invasion into farmlands, etc. In addition to the farming problems, the farmers also faced issues with the post harvesting activities and agricultural marketing.

The Manar Center is highly dedicated to the contextualization of the new developments in the agriculture industry. The Center has in-house scientists and technologist who customize the developments generated by the Indian Council of Agriculture to suit to the conditions of the program region.

The Manar Center has also collaborated with the district government departments, educational institutions, and private institutions to leverage their knowledge and technical capabilities. These collaborations have helped in giving insightful input to the training programs and R&D happening at the Center (Table 3).

Department of Horticulture and Agriculture, Government of Gujarat	The Center for Agriculture-Horticulture Development - Manar is a landmark collaborative effort between Pidilite Industries Limited and the Government of Gujarat's Department of Horticulture and Agriculture. The two agencies have come together to create this knowledge center.
National Research Center for Seed Spices (NRCSS)	Knowledge sharing and capacity building among farmers to grow seed spices.
National Horticultural Research and Development Foundation (NHRDF)	To produce and promote high TSS onion variety seed material.
Technology Information Forecasting and Assessment Council (TIFAC)	Technology assessment for edible seaweed (Monostroma) production and seedling production (Gracilaria dura).
Central Salt and Marine Chemicals Research Institute (CSMCRI)	Feasibility study of commercial seaweed cultivation at Bhavnagar Coast.

Gujarat University - Indian Institute of Sustainability (GU - IIS)	Provide certified courses and trainings to students and support R&D activities in horticulture and value-added product development.
Junagadh Agricultural University (JAU)	The B.Sc Agriculture students from JAU visit the Center for trainings and do internships.

Table 3: Collaborations of the Manar Center with government departments and other stakeholders

Collaborations were also made with the district and block level departments of agriculture, horticulture, fisheries, and livelihood mission.

To keep a track of the training programs, exposure visits, internships, the Center follows an annual calendar. The calendar has activities divided as 'Agriculture-Horticulture Crop', 'SHG, R&D, Post Harvest Training' and 'Seaweed Training'. The calendars plans for every type of activity and training to be imparted to the beneficiary farmers and SHGs.

Collaborations were also made with the district and block level departments of agriculture, horticulture, fisheries, and livelihood mission.

3.1.2 Monitoring and reporting mechanism

The monitoring of the program happens at every level. The cluster officer conducts the first level of monitoring, followed by the field officers, and lastly, the Center head. The activity updates are then given to the Pidilite team by the Center head. The Pidilite team conducts two fortnightly meetings with the Manar Center team every month. The first meeting focuses on the agri-horticulture updates and the second one focuses on the R&D and value addition efforts. As the next update, the Center's team submit bi-monthly reports to the Pidilite team which are shared with the CSR team and the board members as well. Lastly, every six months the Chairman of Pidilite Industries Limited visits the Manar Center in person and observes the activities and carries out in-person interactions with the beneficiaries.

The Center has four field officers who are responsible for a myriad of activities such as training programs, workshops, community mobilization, conducting meetings, administrative tasks, overseeing the demo plots, R&D units, and SHG groups. On the other hand, the two cluster officers are mainly responsible for engaging and mobilising the community to create awareness about the functions of the Center.

3.2. Program reach and impacts

3.2.1 Program reach

The Manar Center has achieved key results such as geographical coverage of 50 villages, the development of 37 Self Help Groups (SHGs), and the involvement of about 8500 farmers, 881 of whom have reproduced various agricultural plants after visiting the Center. In terms of the infrastructure, the Center has 155 demo plots and a soil testing laboratory that offers its services at a subsidized charge of Rs. 100. as compared to the rate of Rs. 250 outside. Farmers also get a Soil Health Card as a part of the test which guides them on crop-wise requirement of fertilisers and nutrient input. Approximately 1200 farms used the soil testing service during the fiscal year of '23.

3.2.2 Program achievements and impact

As part of the Center's initiatives, several activities such as establishment of post harvest processing technology lab, soil and water testings, capacity building training programs for farmers and SHG members, creation of marketing brands, seaweed cultivation training for fishermen and coastal farmers etc. have been undertaken to help beneficiaries. Further, the Center has successfully demonstrated the cultivation of new crops, spices, medicinal & aromatic plants to farmers through demonstration plots.

All of these activities have immensely helped 8500 beneficiary farmers in improving the quality of their soil, seeds, crops and thus overall income. It also helped them minimise post-harvest losses of agro commodities. The sections that follow discuss details of the activities undertaken by the Center.

Agriculture & Horticulture:

The Center has been consistently helping horticulture and agriculture through collaborations with professionals and organizations.. In the past year, the company has helped establish 35 new farmer clubs for important products including cotton, groundnuts, onions, etc., benefiting an extra 1,400 farmers. Over 16,400 farmers are being served by over 615 farmer clubs. In order to encourage the adoption of best practices such as soil management, intercropping, drip irrigation, etc., data on the farmers have been geotagged with area mapping on a digital portal. This has made it possible to give the farmers specific recommendations about how to increase yield and lower cultivation costs. This advice was actively used by about 65% of farmers, who profited from a 10% reduction in the cost of growing cotton and groundnut crops.

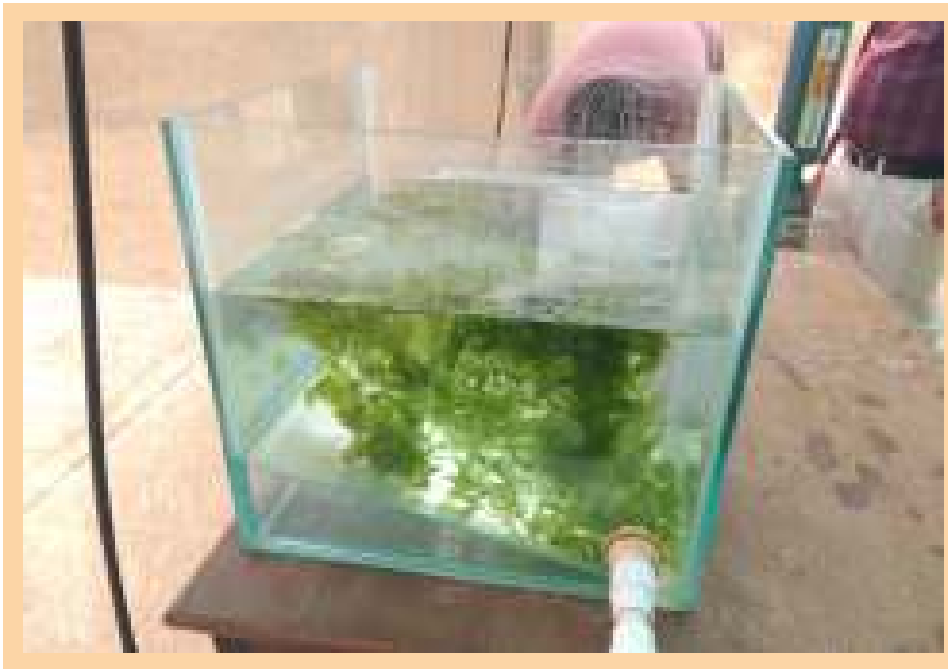
In the area of fruit and vegetable farming, the Company has taken the initiative to develop 36 one-acre wadis along with shade nets to replicate vegetable and fruit crops. 24 wadis are in the developing stage, which will be demonstrated on the farmers' own lands. The average additional income earned by farmers through this intervention is 1.10 Lakhs. The company collaborated with APMC Mahuva to address the issue of the onion crops with large amounts of chemical residue as it is affecting the export. Customised Bio-Input kits have been made accessible to farmers at a low cost. To date, 500 farmers have already started the application of the same to improve crop quality. Various low-cost technologies are being introduced at farmers' fields to reduce drudgery and save farmers time and money.

Farmer Producer Organisation (FPO)

The company has maintained its assistance to the Farmer Producer Organization (FPO). The FPO presently has more than 1,000 farmer members, and more than 3,000 farmers have used the organisation's services and bought high-quality inputs at discounted prices. The FPO's overall revenue increased from 3.70 crore in 2020–21 to 8.38 crore in 2021–22. Farmers have so far received the majority of margins. Through its Custom Hiring Center in Mota, Khutavada village, which also assists neighbouring villages, the FPO has continued to support marginal farmers by offering agricultural equipment at low rental rates in partnership with the Government of Gujarat. The incentive has been given to more than 250 farms. In order to give farmers greater and guaranteed returns, the FPO has continued to collect groundnuts from their doorsteps. Government/Agricultural Produce Market Committee, Mahuva has granted the FPO the Chana Minimum Support Price procurement. 713 MT of Chana from farmers have been purchased thus far.

Seaweed Cultivation

The Manar Center has collaborated with the Indian Centre for Climate and Societal Impact Research (ICCSIR), a nonprofit organisation, with the objective of developing technologies for the harvesting, processing, and value addition of certain seaweeds. 121 farmers in Mandvi have started growing seaweed under the direction of ICCSIR, and rafts have also been created for this purpose. At Mandvi, a tissue culture facility for Kappaphycus seaweed and potash recovery has also been started.



Seaweed cultivation at the Center's lab

SHGs activities

The Manar Center created SHG groups of rural women to involve them in income generating activities. A women's SHG is a group of 10 to 20 women from a village engaged in income generation and savings activities with micro-investments. After establishing a SHG group, they are registered under Gujarat Livelihood Promotion Company Ltd (GLPC) to get support through government schemes.

A total of 37 SHGs have been formed so far and 390 women members are involved in various activities through these groups. Activities currently underway include an initiative to prevent damage from fruit flies, an initiative to make scented candles using citronella oil, which is widely used as a mosquito repellent at the Manar Center and making karonda and lemon pickles, and training and skill development in food production. For them, the Center also created the brand called "MUH-WAH" under which all the products of the women SHGs are sold and from which they directly benefit.

The members of SHG have also been given training on soft skills such as record keeping, inventory, production and marketing aspects. Details of the achievements and impacts of Center's activities are provided in table 4.

Sr. No.	Activity	Number of beneficiaries	Number of activities conducted
1	Training in Farmers training Center	7208	126
2	Training on Manar demo plots	1728	148
3	Training on Farmers field	2312	105
4	Exposure visits to Manar Center for SPNF, various crops, intercropping and horticulture practices for farmers(2021-22)	1097	4
5	Exposure visits to Manar Center by the students (2021-22)	95	3 (training, study and visit)
3	Soil and water testing offered under subsidised rates for farmers	360 farmers	360 samples
4	Internships provided for aspiring students	8	
5	Capacity building training on seaweed cultivation for fishermen and coastal farmers.	184	6
6	Total number of partnerships established with stakeholders	6	
7	Total number of SHG s formed	37 (390 members)	
8	Income generation activity training conducted for SHGs	210 members	24
9	Soft skill training for SHGs members	124 members	9
10	Brands created to help marketing of SHGproducts		1 (MUH-WAH brand)

Table 4: Details on the reach and impacts of Center's initiatives



Post Harvest Products by
SHGs and R&D unit, Manar Center

3.3 Impact Areas of the Manar Center

The following sections give a detailed record of the input and the learnings that the farmers and the SHG members have received on three parameters namely - Knowledge, Attitude and Practices.

3.3.1 Knowledge

This section presents the gaps and challenges that the farmers and SHG members were facing before the training and the variety of training inputs received from the Manar Center.

Input received by the Farmers

The farmers were able to gain knowledge about farming techniques and practices like introduction of new crops and seaweed cultivation. In addition, training about allied agri-businesses such as livestock rearing, fodder making and organic fertiliser making has also been imparted. The Center has aided the farmers to understand various new techniques and practices of farming which are cost-effective in nature and also help minimise / eliminate the use of inorganic inputs. The farmers have been taught to apply organic fertilisers, which are a low cost input, and in addition, the Center has also provided them with vermicompost fertilisers at a subsidised rate.

The farmers were also trained in farming practices such as Subhash Palekar Natural Farming (SPNF). The SPNF farming technique believes that nothing needs to be purchased from outside for the good growth

of the crops.³ Under the SPNF training, the farmers learnt how to prepare their own organic inputs called “*Jeevamrit*”- which is a fermented microbial culture prepared using dung and urine from cows. It provides good nutrients to plants and also prevents fungal and bacterial diseases in plants and *Beejamrit* (seed treatment).

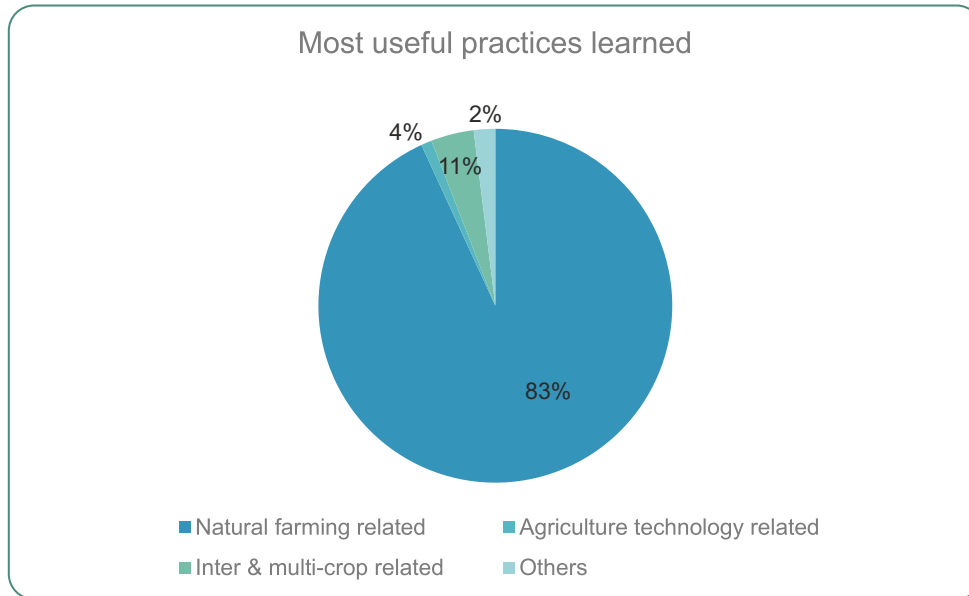


Figure 3: Most useful practices learned

83% of the farmer respondents stated that the knowledge they gained about natural farming has been most useful for them (Figure 3).

The farmers were also given information about the different phases of the crop cycle and the maintenance of the land under cultivation. The introduction of different farming techniques like intercropping, border plantation, input for improving horticulture practices, and introduction of new crops like Citronella lemongrass was done.



Intercropping being practised on a coconut plantation. Turmeric was planted in the spaces between the coconut trees.

The Center also helped the farmers understand pertinent water conservation techniques like drip irrigation. The knowledge imparted also covered farm maintenance aspects which focus on healthy soil through soil testing, soil health card, and knowing the quantity of fertiliser usage in the field. The training design also focused on the practical aspect of learning and included activities like demonstrations of farming practices and exposure visits to other model farms or villages to learn from the best practices of farming.

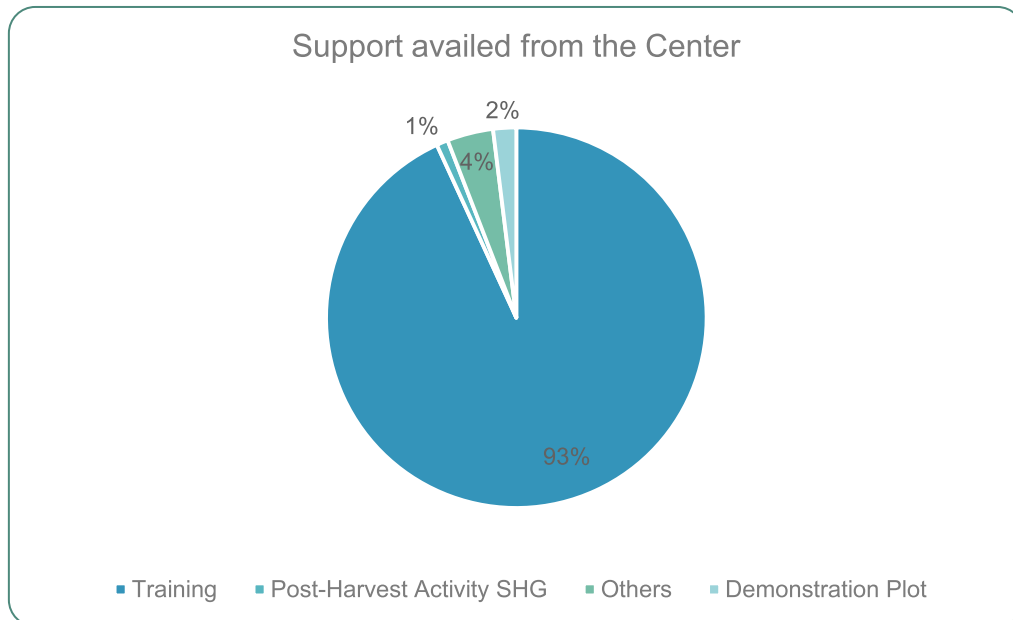


Figure 4: Support availed from the Center by the Farmers

93% of the survey respondents stated that the most support they received from the Center was through the training programs they attended.

In addition to the training, to showcase the new techniques and practices in agriculture, the Center has established demonstration plots. The Center has successfully demonstrated agriculture, horticulture, aromatic, fruit, and medicinal crop cultivation techniques to beneficiary farmers through these demonstration plots. Farmers from 35 adjoining villages have visited the Center to learn the best practices. Low-cost technologies/methods like the one farmer-one cow biogas model, shade nets, fruit fly traps, intercropping, Integrated Pest and Nutrient Management (IPNM), mulching, border plantations, natural farming, no-tillage farming, hydroponics, mushroom units, zero gravity kitchen gardens, Thailand soilless kitchen gardens, etc. are a few demo plots available at the Center.

In addition to the core training on farming techniques and practices, the farmers were also trained on allied agri-businesses like livestock rearing. Training on livestock rearing and its components like fodder development (napier grass), veterinary services for livestock at the Center as well as their *Gaushalas* and welfare, were imparted to the farmers.

Capability building efforts were also taken outside of individual farming to formalise the farmers. The Manar Center has helped form a Farmers Producer Organization (FPO) in the Mahuva block. Given the location, farmers from Talaja, Palitana, Sihore and Vallabhipur blocks are unable to avail themselves of

the benefits of the FPO. The farmers of the region are further limited in resources as they are not associated with the Agricultural Produce Market Communities (APMC) and they are not getting good prices for their produce.

Input received by the SHGs

The majority of the women in the area are involved in daily wage labour in agriculture, small scale industries (diamond polishing, Patta work), sewing, or tailoring work. Though women are engaged in income generation activities, they are not organised. The Manar Center has mobilised them, organised them into groups, and formed SHGs.

The main purpose of SHG creation is to improve the economic and social conditions of poor and backward-class women through income generation and saving activity with micro-investment. Capacity building training was given to all 37 SHGs on various livelihood related activities and processes. Different types of training provided to SHGs are given in Table 5.

Currently, the initiative has 390 women members covering 8 villages. After the formation of SHGs, 5-10 SHGs are further clubbed together to form a Village Organization (VO). The VO head is responsible for arranging meetings, training and skill development and organising exposure visits.

Training type	Number of participant SHGs
Khakra	7 SHGs
Pickle making	10 SHGs
Lemon squash and tomato sauce	7 SHGs
Bakery	1 SHGs
Masala	1 SHGs
Papad	2 SHGs
Syrup (Sarbat from pineapple, orange, mango, kiwi and rose)	1 SHGs
Candle making (online training)	11 women

Table 5: Various trainings provided to SHGs

Among survey respondent groups, the majority of the respondents (28%) received training on the Food Processing Unit . This is closely followed by the 24% of the respondents who received training of the Khakhra making unit (Figure 4).

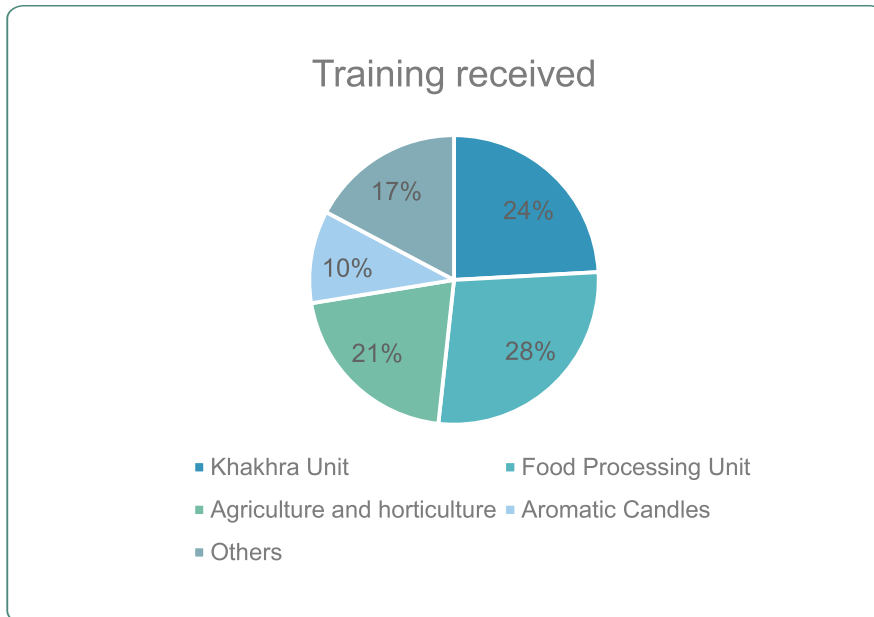


Figure 5 : Training received by SHG respondents

In addition, five SHGs from Manar have undergone a brief training at Kalsar Food Lab on different types of pickles and six types of khakhara. The SHGs were also involved in mask making during the COVID-19 pandemic.

Currently, the SHGs are engaged in fruit fly trap making - an initiative to decrease the damage to mango crops; aromatic candles with citronella oil (mosquito repellent);, karonda and lemon pickle making, and training and skill development for food product manufacturing.



FGD being conducted with the SHG involved in fruitfly trap making

In addition to the post harvest training, SHG members also receive training on soft skills such as record keeping, selling and marketing knowledge. The leaders of the SHGs have been given four training sessions on soft skills and capacity building. The other such trainings given to SHG members are given in Table 6-

Capacity building	Training type	Number of participant SHGs
	Record keeping	32
	Animal husbandry	18
	Livelihood and livelihood market management training	19
	MHM training	22
	Dialogue with self-reliant women	54
	Women Safety training at Gujarat maritime board	25 women from Alang

Table 6 : Various soft skill training provided by the Center to SHGs

In efforts to formalise the sale of these products, the Manar Center has formed the “MUH-WAH” brand for the SHG women, under which all products of the women SHG (10-20 members) are sold, and they directly benefited. The Center has also developed a grading system for the SHG group for evaluation on the basis of their activities and expertise.

Through the SHG formation initiative, the members are now involved in saving activities and are able to get financial support through loans of up to Rs. 1,00,000 for themselves or for their families. The Manar Center has played a vital role in mobilizing rural women and organizing them in groups and helped build their capacities. The Center has also helped the SHGs become associated with the Gujarat Livelihood Promotion Company Limited (GLPC) and the State Livelihood Mission. This convergence has benefitted one of the VOs to get a support of Rs. 7,00,000 from the GLPC.

3.3.2 Attitude

Experience of the Farmers

The Manar Center has created two clusters, Mydhar and Sihore. The mobilisation and awareness efforts were undertaken by the cluster and field officers at the Manar Center. The mobilisation team had strategic measures for creating awareness, which first included village identification, conducting meetings with the farmers wherein information about the Center was provided. During these meetings, farmers were also given information on crop selection, natural farming and production. The mobilisation team sought support from the Gram Panchayat to have a more efficient reach into the community.

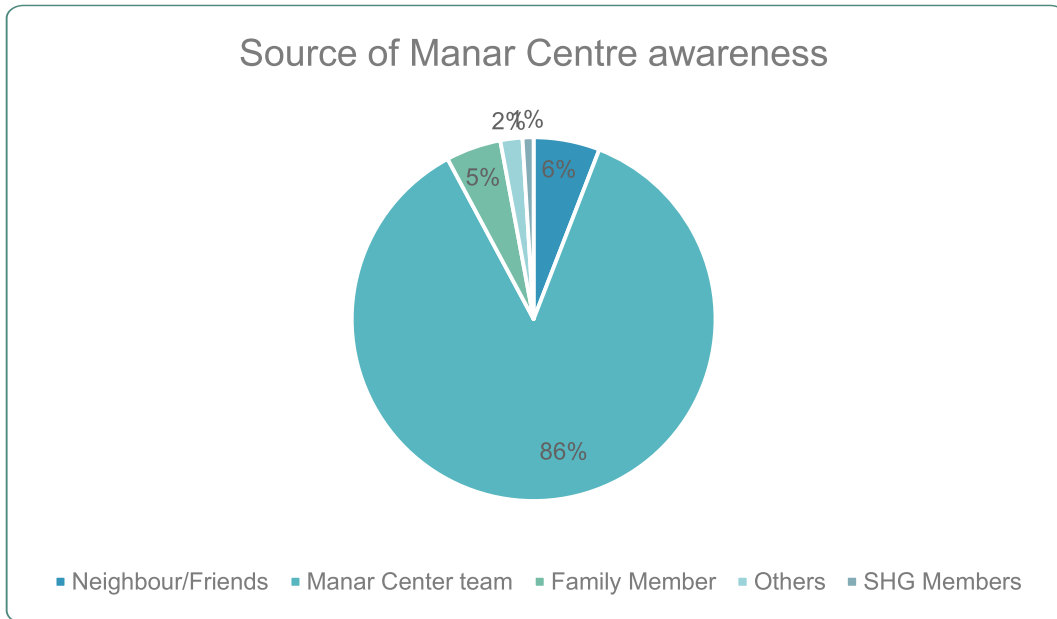


Figure 6 : Source of awareness about the Manar Center for the Farmers

86% of the survey respondents mentioned that they got to know about the Center through the Manar Center team during village level meetings (Figure 5).

Currently, the Mydhar cluster has around 1000 farmers, and the Sihore cluster has 700 who partake in the training activities. Under every cluster, there are farmer clubs, each of these having 15 farmers. The cluster officers who monitor the activities also conduct regular meetings with the farmers' club leaders every 10th of each month. They are also connected through a WhatsApp group to share information and updates with the other farmers. The field officers are also actively engaged with the farmers and constantly respond to their queries or suggestions.

The survey respondent farmers expressed high satisfaction with the experience at the Manar Center (Figure 6). 98% of the respondents are satisfied with the materials used for training and said that training materials used were updated and sufficient. In addition, 98% of the respondents also felt that the facilities at the Center and the infrastructure created were adequate. In all, 96% of the respondents were very satisfied with the experience of training at the Manar Center. In light of their whole experience, 99% of respondents feel that the training offered at the Center is required for farmers and that they would recommend it to others.





Figure 7 : Ratings by farmer respondents about various components of training programs

Experience of the SHGs

Similar to the mobilisation steps taken for the farmers, the cluster officers of the Manar Center conducted meetings with the women to make them aware of the SHG initiatives. 89% of the respondents became aware of the SHG initiative directly through the Manar Center team members, and 7% stated that they became aware through their family members.

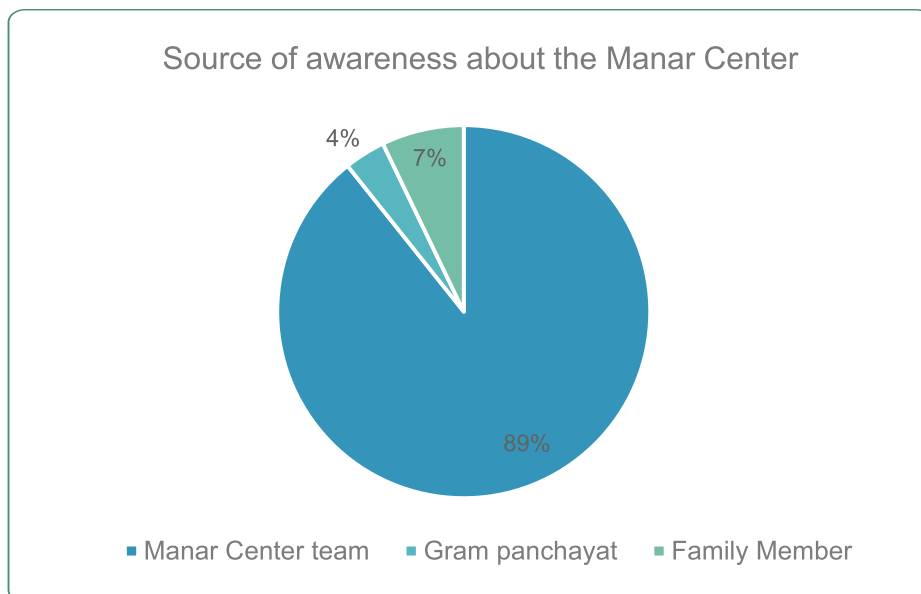


Figure 8: Source of awareness about the Manar Center for the SHG members

After becoming members of the SHGs, women experienced an increase in their daily wages. Earlier, they used to get Rs. 150 as daily wage labour and now they are earning Rs. 300 as their daily wage. This growth in wages was experienced by the women who are involved in the R&D unit at the Center. Whereas the other women are earning monthly Rs. 3,000-4,000 through the various activities. And they have continued their additional activities, such as sewing and embroidery work (Rs 1200-1500). In a month, women earn around Rs 5000-6000. Women can also contribute to household expenditures. One of the members of SHG who is a widow, shared that she is able to pay fees for her children's education due to the work provided by the Center.

A field officer from the Center, Ms. Bhavuben Makwana, who is in charge of the SHGs activities in the area and is responsible for monitoring of the group and reporting them to the Center head visits the work units regularly to meet the members and conducts meetings on a regular basis. Bhavuben shared that it was challenging initially as the community was not supportive of the formation of this group.

“The community members were not supportive of women stepping out of the house for meetings. A change in this attitude has been observed after the women started working and earning money.”

- **Bhavuben Makwana, SHG incharge**

Bhavuben recalled that the women of the area who used to be housewives who never stepped out of their house are now engaged in income generation activities and also mobilise the other women of the village who are not part of SHGs.

The survey responses of the beneficiary SHG members showed high satisfaction among SHG members for the knowledge received from the Manar Center (Figure 7). 90% of the respondents stated that the knowledge received from the Center is useful. 93% of the respondents felt that the training given by the Center was required and were very satisfied with their experience. Lastly and most important the majority of the respondents (79%) felt confident and empowered due to the learnings they received during the training provided by the Center.



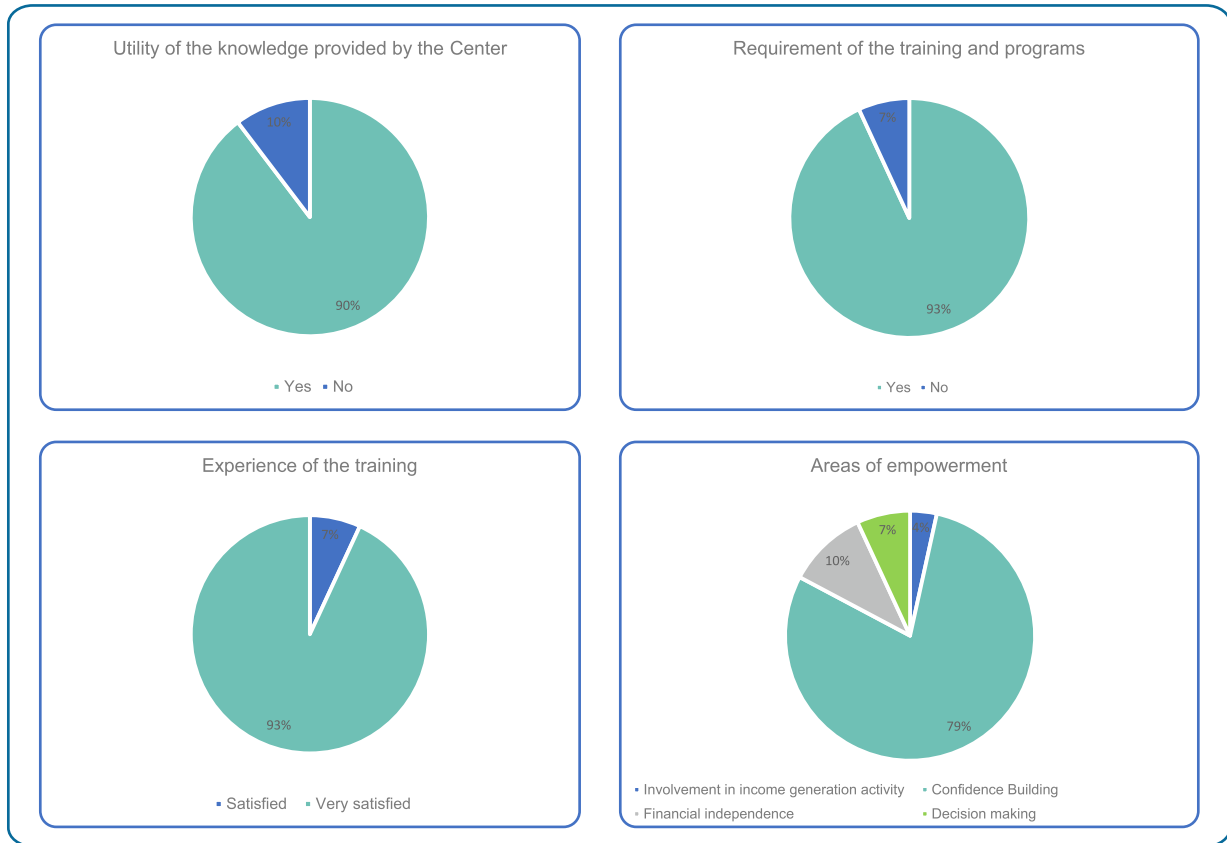


Figure 9 : Ratings by SHG respondents about various components of training programmes

3.3.3 Practice

The Practice section denotes the findings acquired from the knowledge and learnings that the farmers and the SHGs have been able to apply and benefit from.

Practices Adopted by the Farmers

The farmers who received training at the Manar Center have adopted a few of the farming techniques. Some of the practices being followed are intercropping farming, border plantations, preparing vermicompost, and fodder development. In addition, practices like drip and sprinkler irrigation, SPNF farming techniques, soil testing, and ensuring the quality of the fertiliser being used on the land etc are also adopted by the beneficiary farmers.

In particular, natural farming is introduced to reduce input costs and enhance the farmer's income. The training received at the Center and the subsequent adoption of these practices have been beneficial to the farmers on multiple fronts (Figure 8). First, it has helped them increase their income. 35% of the survey respondents stated that they have noted an increase in their annual income. Second, it has increased their knowledge and skill levels to perform better in agriculture and horticulture. Finally, they experienced an increase in farm yields (29%) and also cost reductions on inputs.



Figure 10 : Benefits experienced by farmers as a result of trainings and adoption of natural farming techniques

With regards to increase in income specifically, 59% of the respondents noted an increase of 10%-30% in their income, 20% of them experienced 30-50% increase in income and 1% of the respondents even experienced an 81%-100% growth in their income (Figure 11). This is an important outcome of the Center activities, and this data could imply that nearly 85 (1% of 8500 of total beneficiaries) farmers have doubled their income while all beneficiary farmers experienced an increase in income.

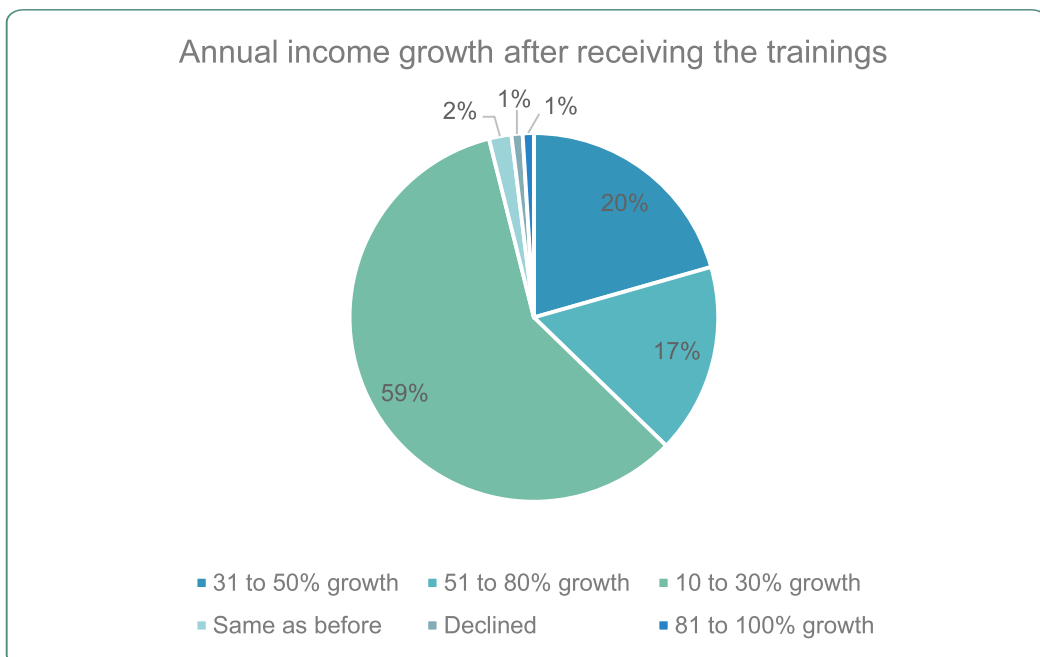


Figure 11 : Increase in annual income post trainings

In terms of understanding the utilization of the learnings received from the Center, a significant 92% of the respondents stated that they are able to use their learnings for all farming activities (Figure 12).

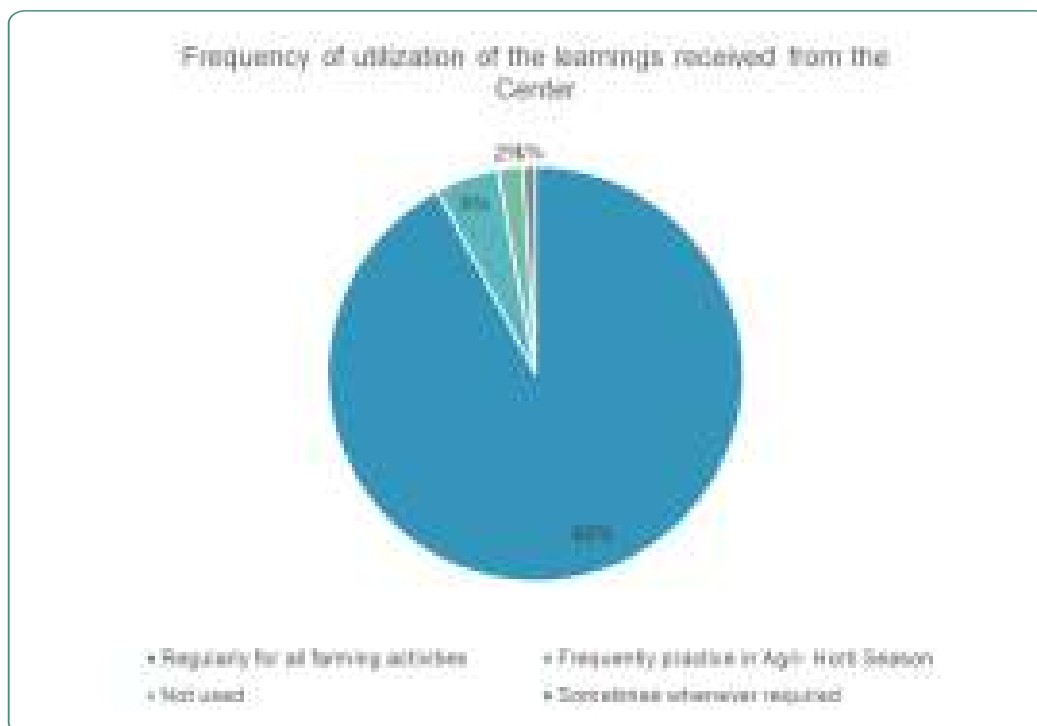


Figure 12 : Utilisation of learnings received from trainings

Due to the application of the free-of-cost input received from the Center, some farmers have become model farmers. These farmers help mobilise and motivate other farmers to avail themselves of benefits from the Center by participating in the training programs.

One of the concerns expressed by the farmers had to do with not being able to get the right price for their produce. At present, most of the farmers, especially the cotton farmers, are not happy with the prices they receive in the market. The farmers are interested in the formation of more FPOs so that they are able to get good prices. There are also requests for improved agricultural marketing, which will aid the farmers get a platform or market which offers preferred pricing.

The Center also helps farmers avail government schemes under which they have been able to get support for storage facilities (e.g. shed for the onions), subsidies for drip irrigation, barrels for natural farming, and incentives of Rs. 900 for cow-based farming (one farmer, one cow) etc. Presently, farmers do not get influenced by the agricultural products or agro-stores in the market. They consult the Center or field officers before using any products or applying any farming practices in the field.

A change in attitudes and behaviours among the farmers has been noted as they witnessed the change in the crop pattern and increase in their income due to the introduction of a new crop and new farming techniques. This positive change in attitude was also created due to the demonstration plots and exposure visits. 155 types of agri-horticultural crops are demonstrated and practiced in the demo plots.

This helped the farmers see the benefits of the farming practices in real-time. The demo plots initiative has been dedicated to a land area of 2.5-acre for the years of 2022-23. The Center currently has three demo plots of which one is entirely dedicated to R&D and the produce from the other two are sold in markets. The Total income generation from R&D demo plots between 2018 and 2022 is Rs. 8,33,832 lakhs.

Practices adopted by the SHGs

The practical training received at the Center has helped the SHG members engage in new income generation activities. The women are now involved in work that provides them with a regular monthly income. Figure 13 represents various income generation activities that the SHG respondents involved post training.

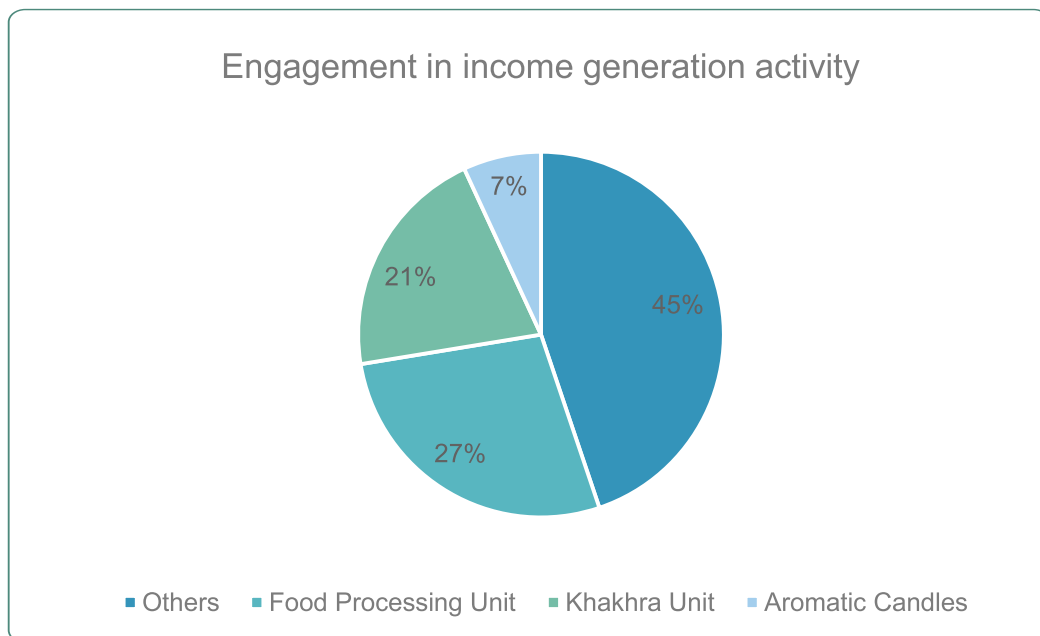
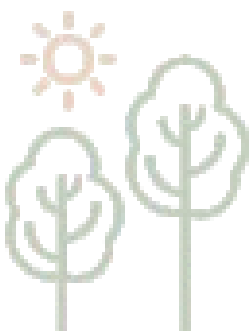


Figure 13 : SHG respondents' involvement in income generation activities



Due to the formal training, the women have also become familiar with technology and adopted it in their activities. The women involved in making the mango pulp use machines such as the seaming machine and use sterilization processes.



SHG members making mango pulp with the help of a machine



Steam distillation machine used by the SHG members in the aromatic oil unit

The SHGs actively participated in the intervention and have been able to run businesses successfully by producing goods such as mango pulp, fruitfly traps, masks, aromatic candles, khakra, and pickles. Details on these income generation activities are provided in Table 7.

Type of income generation activity	Number of women involved	Production	Income generation
Mango pulp	11 women SHG - Alang Mahila Mandal	3250 units of mango pulp (sweetened and unsweetened)	Rs. 2.98 Lacs
Fruitfly trap making	11 women	1500 trap (1st step) 200 trap (2nd step) 220 trap (3rd step) 1465 trap (4rd step)	Rs. 1,25,205/- (some income is yet to be realized)
Mask making	06 women	3000 masks	Rs. 9,500
Aromatic candles initiative	11 women SHG - Alang Mahila Mandal	1290 candles 1. Designer pillar 2. Tulshi kiyaari 3. Dia 4. Teddy	Rs. 7,520
Khakra	7 women SHG - Chamunda Mahila Mandal	Sales : 725 kg FSSAI license/registration no. - 20721006000105	Rs 47,777
Festival activity		500 rakhis	Rs. 1,750
Karonda pickle initiative	SHG - Gayatri Mahila Mandal	Pickle made from plot of karonda at the Manar Center	-

Table 7 : Details of income generation activities of the beneficiary SHGs

97% of the respondents feel that they have benefited from the horticultural development which has happened at the Manar Center (Figure 14). Since the SHG activities are largely post harvest in nature, the horticulture development subsequently allowed them to gain more work.

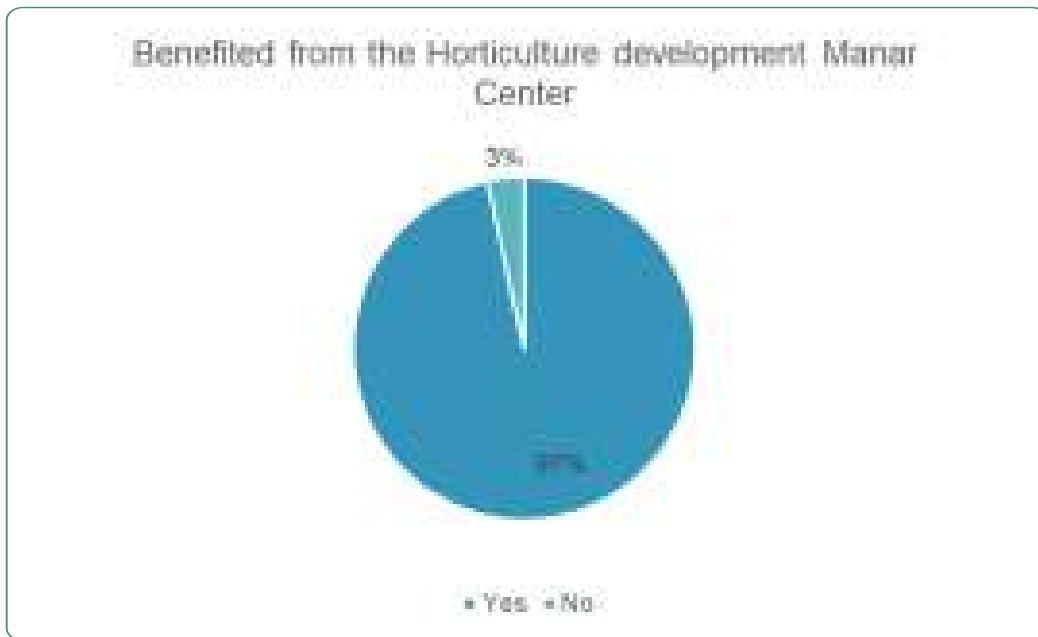


Figure 14 : SHGs benefits from their involvement in horticulture development

Though initial mistakes were made while learning the production process, participating in these activities has boosted their confidence and made them more interested in learning new skills and getting more work. They have also been able to contribute their earnings towards household expenses and education and wellbeing of their children. This ability to help their families has boosted their confidence and further motivated them to get more work and be more productive outside their homes. The fact that these women were able to contribute towards the family expenses has not only enabled them to gain support for their work from family but also earned them good respect in the family. All of the respondents mentioned that their family now has a positive attitude towards women working and supporting it.

The healthy rapport established with the Center's field officer encourages women to consult them if they have any queries about their work, assignments, or want to know about any new training programs at the Center. Going ahead, the SHGs have expressed their desire to work in long-term engagements throughout the year rather than do just seasonal work. The members have also expressed more interest in getting involved in seaweed farming training as compared to the *papad* and *khakra* making training. In the current pattern, 81% of survey respondents said that they are only able to utilize the training received in the agri-horticulture season. Activities such as aromatic candle making are profitable initiatives, but they are seasonal and involve short-term engagement.

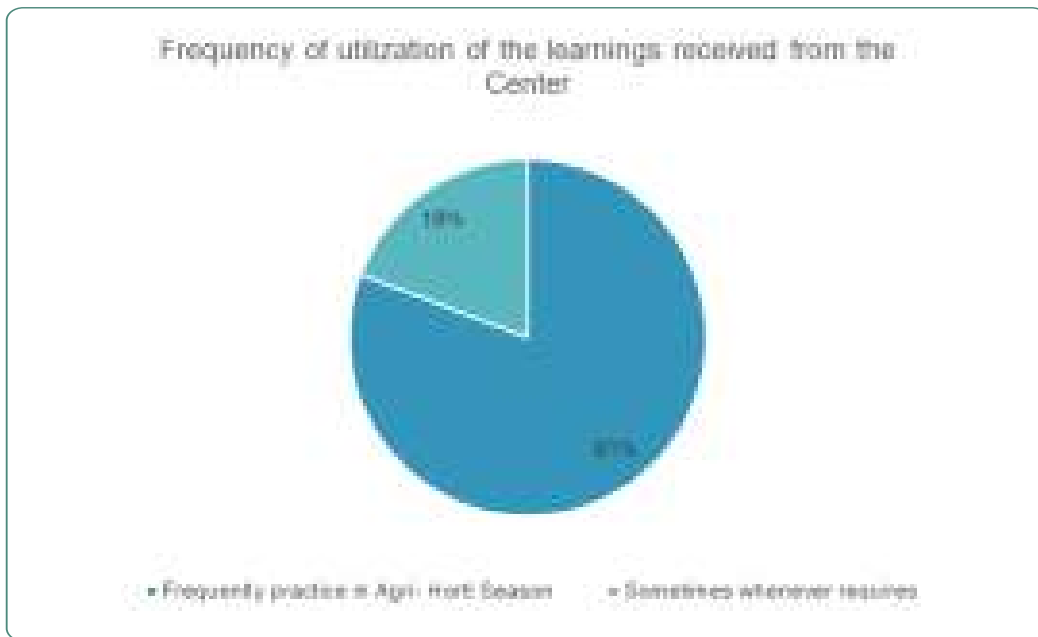


Figure 15 : Utilization of the learnings received from the Manar Center



4. ANALYSIS

REECIS Evaluation

The following section provides a detailed evaluation of the program basis the REECIS framework on the six parameters of - Relevance, Effectiveness, Efficiency, Impact, Coherence and Sustainability .

Relevance

The first criterion in the REECIS framework, Relevance, is to understand how far the program is responding to the needs of the beneficiary group.

Agriculture is the primary occupation for the majority of people residing in the program areas. Given the proximity to the sea, salinity has been an increasing challenge for them. Every year there is an increase in the salinity in lands spreading into the fertile agricultural lands . This reduction in fertile land was further exacerbated due to inadequate water, lack of upgradation in agriculture practices and lack of access to latest knowledge and techniques. This situation was demotivating to the younger generations who then started to migrate out of Bhavnagar district to Surat for labor work. In all, the combination of water inadequacy, degradation of soil quality, lack of newer cultivation practices were creating unfavourable conditions for agriculture and affecting livelihoods and income of many in the region.

Given the social and cultural structures of the communities in the program area, the rural women faced mobility restrictions and they were not allowed to participate in income generating activities, especially the ones that would require them to step out of the house.

The Manar Center was created with a vision to provide knowledge and solutions to address all the challenges faced by men and women through provision of training and resources. The Shree Gram Daxinamurti Heritage Trust which runs the Center has been present in the region for many years. Their in-depth knowledge about the community and the issues faced by them has helped to design an apt program that was very relevant to the geography and the community. The local experience working with community has helped Center to contextualize the resource material to the farmers.

To address the water challenge, the Center introduced drip irrigation to farmers which improved water efficiency in the area. The Center then worked on curating training programs by engaging prolific institutions who provided high quality knowledge and technologies to upgrade the agriculture practices. The Center also succeeded in addressing inadequate income generation from agriculture through this. Introduction of new crops which can secure higher prices in the market such as horticulture crops, medical plants, aromatic plants and spices was a very timely solution. Introduction of techniques like intercropping also ensured that small and medium sized farmers are benefited.

Through the Center's efforts to create SHGs to participate in post harvest activities, the Center has successfully involved women of the community in income generation activities. This has helped households get another stream of income and more importantly boosted the morale of the women.

Creation of post harvest activities also increased the income of the farmers as a single produce such as aromatic plants now had multiple sale opportunities such as the plant itself, aromatic oils as well as the candles.

The Center's efforts to formalize women's economic activities through SHGs and the farmers into FPOs ensures that they get a platform where they can get support and exercise decision making.

Furthermore, creation of an infrastructural facility has helped make knowledge accessible to the farmers and SHG members. Due to the presence of the facility, scientists from institutions are able to travel to the Center and conduct training programs in an appropriate setting with needed facilities.

Overall, all interventions implemented by the Center to address challenges faced by farming communities in the region find high relevance.

Effectiveness

The second criterion in the REECIS framework is Effectiveness, which measures the extent to which the intervention achieved or is expected to achieve its objectives, and its results, including any differential results across groups.

The Manar Center was formed with an objective to improve the agriculture and horticulture practices in the area (Bhavnagar) and help the community. Awareness programmes, exposure visits of the farmers, demonstration plots for witnessing the farming practices, natural farming and low cost technology etc has helped the farmers in providing the knowledge about different practices. Eventually it helped in improving their farming practices and increasing their productivity and income.

The program design and the training programs have effectively incorporated oral and visual teaching methods. Though the farmers of the region hold a minimum of a primary education, imparting training through oral and visual methods is a more appealing and engaging form of teaching. The demonstration plots provide a visual of the new techniques and practices as well as show the benefits of their adoption to the farmers. In addition, the plots are effective as learning through them presents a low risk to the farmers in terms of investment of their time, money, agricultural products and land.

In addition, the collaborations that the Center made to create the training programs has ensured that the beneficiaries have gained high quality of the training knowledge from reputed institutions. The training programs and the range of topics covered has also helped the farmers gain knowledge that can aid with the entire cultivation process. Continuous efforts have been made by the Center to collaborate with the experts and the educational institutions and share the best practices with the farmers. SPNF, Aromatic crops and border plantations are the practices adopted by the farmers. Even the Governor of Gujarat visited one of the farmers practising natural farming in Timana Village and recognised the work of the center.

They have also successfully helped the women to form the SHGs in the village and work in different income generating activities. There has been change in the attitude and perception of the community towards the women participation in work and earning money.

Efficiency

The criterion of Efficiency measures the extent to which the intervention delivers or is likely to deliver, results in an economical and timely way.

The Manar Center has three teams shouldering different responsibilities related to the program implementation. The managerial team, the technical team and head office management team. The managerial team, consisting of 4 persons, is focused on performing tasks like administrative responsibilities, collaborations with external institutions, procurement, account management etc. The technical team consists of 2 cluster officers, 4 field officers, 1 agriculture officer, 1 technical officer, 1 technologist and 2 scientists. The technical staff are responsible for mobilising, training and providing handholding support to farmers on natural farming and water conservation techniques. In the technical team, especially the cluster officers are individuals belonging to Bhavnagar district. Having local individuals in community facing roles has eased the mobilization process to a greater extent. Since the program involves accepting new practices for a primary source of income, having someone who could connect faster with the community has been efficient.

The technical team also has a food technologist, a project scientist and an R&D scientist who is also involved in product development. By far, having an in-house team of experts has been the key highlight and it strengthened the presence of the Manar Center as a knowledge-based institution. It also helps the precise contextualization of the newer practices and protocols which are emerging in the agriculture industry.

While the current team at the Center is managing at its best, our interactions with the Center staff revealed that the existing staff size is not sufficient to fulfil current demands for the implementation of all planned activities of the Center. Hence, the staff are of the opinion that the addition of more staff will make it more effective, especially for the probable expansion of activities.

For effective time management, the Center created a calendar for all the training programs and exposure visits which were planned to be carried out. This calendar was aligned with the crop cycles and the type of crops which can be grown in that particular cycle. This practice of creating a calendar helped streamline the training programs and also the beneficiary group which is the most suitable for it. Majority of the interventions and activities of the Center involved R&D type of work and also knowledge transfer and adoption of new techniques. These activities naturally are time consuming. However, with the meticulous planning and execution of training programmes and strong involvement of motivated staff at the Center made it possible to bring intended outcomes at the earliest.

Impact

This criterion measures the extent to which the intervention has generated or is expected to generate significant positive or negative, intended or unintended, higher-level effects.

The program has been successful in catering to the unique geography present in the area. The practices and techniques which have been introduced to the farmers are inclusive to any size of land-holding.

Along with the knowledge, introduction to allied businesses and strengthening of post harvest productions is helping ensure multiple streams of livelihood to the community.

With the SHG members, since their economic status has improved from their monthly earnings, they have been able to contribute to household expenditure, children's education and healthcare expenses of the family. This newly acquired status of SHG members in their family has empowered them and boosted their confidence and also enabled them to take part in decision making in their families. The increased spending pattern towards children's education exhibited an investment in the literacy of the future generations and also the overall health of the family. The spending power thus combined, has a longer and sustainable impact on the development of the community in vital areas of literacy and health.

Coherence

The fourth criterion in the REECIS framework is Coherence. This measures the compatibility of the intervention with other interventions in a country, sector, or institution.

The program has made strategic collaborations with private as well as government institutions to ensure the quality of their facilities. Institutions such as NHRDF, TIFAC, CSMCRI and the GU-IIS had a multitude of involvements such as promotion of new crops, technical and feasibility assessments and imparting certified courses. Leveraging these institutions for their knowledge not only ensured the latest information of the sector but also ensured the compatibility with the geography.

The program design gave importance for formalising the beneficiaries to make their income generation process oriented and structured. The Center helped farmers create an FPO. Getting formalised in an FPO allows farmers to be more in charge about the price for their produce. Being organised in an FPO also reduces the dependency on a middle-man who claims a stake in the profit. The program has also helped farmers beneficiaries become aware of the government schemes related to agriculture and livestock which can help reduce the burden of the recurring expenses during the crop cycles.

In case of SHGs, the entire initiative is aligned with the central government's efforts of getting women into micro-financing through the Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY – NRLM). Furthermore, converging SHGs to the GLPC and SRLM ensures that the SHGs are recognised by the state of Gujarat and are rightly supported in their efforts.

Sustainability

The criterion of Sustainability measures the extent to which the net benefits of the intervention continue, or are likely to continue.

The Center focuses on capacity building and skilling of the farmers and SHG members by imparting high quality practical and technical training. The free-of-cost training provided to the beneficiaries empowers them long-term on multiple levels such as knowledge, skills and cost-effective farming practices. This creation of knowledge has provided the beneficiaries with a long term resource that helps develop their livelihood and skills for the foreseeable future.

5. RECOMMENDATIONS

Training tool kit for the farmers

Farmers should be provided with a training tool kit that lists the practices and techniques that were mentioned. It will also help them mobilize other farmers in the village and provide them with information.

Training of model farmers

The model farmers identified by the Center should be trained (master trainers) so that they can train the other farmers. The model farmers will mobilize and train farmers in their respective villages.

Greater focus on post harvest management

Post harvest management will help reduce losses of perishable horticultural products during harvest, transportation, handling, storage, etc. To this end, packing houses, ripening chambers, cold storage, delivery trucks, and mobile processing units are needed in the region.

Forward linkages

Farmers repeatedly pointed out in the discussion that they are not getting a good price for their products. They requested that there should be a mechanism through which they can sell their products and get a good price for their farm products. The focus should be on the forward linkage of products so that farmers can get good prices in the market.

Aromatic plants

Manar Center has proven through its agricultural practices that aromatic plants are useful for farmers. They helped curb wildlife intrusion into the fields and helped farmers earn additional income. The introduction of more such aromatic plants in the region should be encouraged.

Vermicompost and mushroom plants

Vermicompost is becoming increasingly popular and practised in most regions. Some of the plants established under the Manar Center are working well. These plants should be more focused on the region.

Innovative business ideas for SHGs

Aromatic candles, fruit fly trap making and mango pulp processing are the seasonal works that SHGs are involved in. In addition, other innovative ideas should be introduced that would help the women to work throughout the year.

Hiring more staff for the Center

Currently, the Center has 8 technical staff and 2 cluster officers who oversee the field, training, research

and development, and food processing activities of the center. They are actively involved in field activities and community engagement. However, the Manar Center needs more staff. The recruitment of more staff for the Center should be targeted.

Replication of the model - Manar Center

The Manar Center has become a Center for knowledge sharing and demonstration of agricultural practices and techniques. It has imparted knowledge of various farming techniques to the farmers, and they have also adopted them. Even government departments, institutions, and educational and private bodies have partnered with the Center. A replication of this model should be made in other parts of the country so that knowledge sharing and learning continue within the community.

Creation of more FPOs

Currently, all farmers are not able to access the FPO in Mahuva. Creation of more FPOs can ensure that all the beneficiary farmers who have been covered in the Center's outreach can benefit from them.



6. CONCLUSION

With the aim of helping farmers in the region, the Manar Center for Agriculture and Horticulture Practices was established to provide relevant information and knowledge to farmers and assist them in their agricultural practices. Barren land, water scarcity, soil salinization and erratic rainfall are some of the challenges of the region that need to be considered while working in the area. The Center has overcome these challenges and successfully introduced various agricultural and horticultural farming practices & techniques in the region. Through their in-house training facility, exposure visits and demonstration of farming methods, they have imparted knowledge to the community. They have developed state-of-the-art post harvest processing laboratories that have been well-received by scientific and educational institutions.

In addition, the Center has been working to empower women in the Bhavnagar district. The Center has helped these women to form SHGs in the villages and helped them involve in money-saving and income-generating activities. With the improved income, these SHG women and their families have been able to access good education and health care.

In collaboration with government departments, institutions, and educational and private bodies, they imparted the latest cultivation practices to the farmers that contribute to sustainable agriculture and horticulture. They constantly strive to transfer knowledge from experts and universities to farmers. It has become a knowledge hub for agriculture and horticulture.

The key takeaway from our findings and analysis is that this model is successful in curating solutions to the unique challenges of those dependent on agriculture for their income. The model holds high value in replication as the solutions are not only effective to a particular geography but also focus on formalising the beneficiaries for the long term.

7. ANNEXURE

1. Field Story

Natural farming in Timana village



Shri Pandya Ginjashankar ji in his farm in Timana village

Shri Acharya Devrut, the Governor of Gujarat, visited Timana village last year in January 2022 to talk about natural farming and its benefits. One of the farms he visited is that of Shri Pandya Ginjashankar Rahuji.

Information about the Center

Shri Ginjashankar ji is a retired government teacher. After retirement, he devoted his time to farming. He has been involved in farming for a long time now. Talking about the Manar Center, he said that they (other farmers in the village) came to know about the Center through another villager (Talaja block) and its training and support activities for farmers. They wanted to approach Mahipal ji (Cluster Incharge of Manar Center) and asked him to provide them information and training as they had done in other villages.

Training by the Manar Center

He knew the old traditional farming methods where they use chemical fertilisers and irrigation systems

for the agricultural land. These are the same methods he observed his elders using and which he used himself. But he visited the Center and attended training on SPNF, intercropping, tillage and drip irrigation. He learnt many new things about agriculture and horticulture.

Improvements and visit from the Governor of Gujarat

In his 9 bigha farmland, he used chemical fertilisers like DAP, urea, phosphorus and his cost for 1 bigha land was around Rs 3000-4000. After the training on SPNF he is not using chemical fertilisers anymore and water consumption in the field has been reduced. He is satisfied with the results of Natural Farming as it has increased his production and income. He grows peas dal (tuvar), jowar, sugarcane and groundnut. Besides, he also does horticulture and has mango, lemon, guava, sapota and custard apple trees on his land. His farm has become a model farm as he practises natural farming, vermicomposting, intercropping, horticulture and spice cultivation. His income has also increased by adopting these practices (about 10 lacs).

Orchards in Valavad village, Sihore Taluka

Rain and damage to orchards

In Sihore, many farmers are engaged in horticulture and earning good profits from selling their fruits and vegetables. Shri Ramsinh Rupsinh Chauhan, resident of Valavad village of Sihore taluka has orchards. He owns 34 bighas of land in which he has lemon and Guava trees, which have suffered a loss of about 5-7 lacs due to the heavy rains for two years in a row (2019-20).

As much as 5% of the trees in the orchards have been destroyed due to this heavy year. Compensation has been provided by the government to the affected farmers which has helped to restore their farms.

Awareness of the Center

Through the cluster officer of the area, Kanu bhai, he came to know about the various activities of the Manar Center. He was asked to visit the Center and see the demonstration plots of agricultural practices. Following this, he decided to participate in the training programme.

Participation and Adoption of practices

He attended the training on SPNF and horticulture practices. He also learns to prepare natural medicines and fertilisers for the crops. The training helps him to know what medicines are needed for lemons and when and how often to apply them and when to water the trees. He has grown lemons on 20 bighas and earns around 20 lakhs from these lemon trees. He has also planted guavas in 10 bighas and earns 7 lakhs per year from them. He sells his produce to an organic vendor in the APMC market in Bhavnagar. He also uses 4 bighas of land for growing fodder (Napier grass) for his cattle. He also practised intercropping in the field by growing different crops and plants.

2. Farmers Awareness Program and Training Activities Manar Center 2021-22

Sr. No.	Name of Training	Number of farmers	Training purpose	Training subject
1	Farmers Exposure visit at Manar center	60	On field training on SPNF for various crops at fro farmers from Amreli district.	Horticulture crops (Pomegranate, Amla, Custard apple)
2	Training & exposure to first batch of B.Sc Agri students RK Uni. Rajkot	35	Training , study and visit at manar center	Horticulture, agriculture, aromatic, medicinal and spices crops
3	Training & exposure to 2nd batch of B.Sc Agri students RK Uni. Rajkot	40	Training , study and visit at manar center	Horticulture, agriculture, aromatic, medicinal and spices crops
5	Training and exposure to B.Sc JAU students	20	Training , study and visit at manar center	Horticulture, agriculture, aromatic, medicinal and spices crops
6.	Farmers Exposure Visit at Manar center	22	On field training on SPNF for various crops at Manar center from near villages	Horticulture crops (Date palm, coconut, Mango, Sapota)
7	Training on organic farming in horticulture and agriculture crops	175	Gopal sutariya and manar center gave training on organic farming and awareness of cow base farming to farmers	horticulture and agriculture crops
8	One day farmers training and experience sharing with farmers on horticulture and agriculture crops	110	Mayank Gandhi & Hon.Mansukh Bhai Mandaviya team with center staff gave training and center visit to farmers	New Initiatives in Horticulture and Agriculture crops
9	Training on Animal husbandry	150	Center visit and farmers awareness on animal husbandry by Gopal sutariya and Manar center	Animal husbandry
10.	Farmers camp for Citronella planting material distribution with Horticulture department, ATMA and DDO, Bhavnagar	120	DDO Bhavnagar, Horticulture Bhavnagar, ATMA and other GOV. staff with manar center organized training and distribution of citronella to famers at manar center	Aromatic crops

11	Farmers Program on the occasion of Launch of Prime Minister "Saat PAGALA scheme"	125	Hon. MLA Mahuva and senior Gov. officials organized program at Manar center for Government scheme and training .	Launch of , " saat PAGALA scheme"
12	Joint initiative on Aloe vera Cultivation training	25	Dr. Jagdish Prasad , CEO, (GMPB) visit and training on medicinal crops	Medicinal crops
13	Farmers seminar for training on Intercropping of Aromatic, Spices, Medicinal crops with Perennial Crops	1500	Conducted 30 farmers seminar at Manar center for farmers from Talaja, Gogha vallbhipur, Palitana , Sihor and Amreli taluka.	Intercrop models of Citronella, Aloe Vera, Turmeric in Perennial Crops.
14	Twenty-five field day on Horticulture crops during rabi (12) and kharif season (13) at Manar center.	1000	Farmers from 30 villages from 6 taluka visited center for training and exposure on Horticulture crops	Spice Crops, Fruit Crops- Thai Guava, Custard Apple, Lemon, Sapota, Net House and aromatic crops
15	Training on SPNF farming - methods and application	22	To provide live demonstration on production process of organic fertilizer (jivamrut and Bijamrut)	Horticulture and agriculture crops
16	Exposure visit at Manar Center	15	New initiatives on Intercrop models in	Horticulture with Aromatic & medicinal crops
17	Training with Horticulture department on Vegetable Kitchen garden and kit distribution	20	To provide information to farmers about kitchen garden kit benefit.	Horticulture crops
18	Joint collaborative initiative with DDO-Bhavnagar, hort. Department, ATMA and NHRDF on " Onion seed production -New variety for high TSS content" ,	7	Training on onion seed production of NHRDF new variety - Agri found white for onion seed production	Onion Seed Production

About Nusocia

NuSocia is an impact advisory organisation.

It started its operations in 2017 by a group of industry experts, with more than decades of experience on different sides of the social impact spectrum. Its mission is to enable the impact ecosystem by delivering programmes with impact that is evident. It was incubated at NSRCEL, IIM Bangalore.

The team comprises of CSR professionals, Management Consultants, Social Sector Professionals, Data Scientists, and Social Researchers with a common passion to generate ideas that matter for the people.

NuSocia works with Corporations, Governments, Foundations, and Non-profits to help the establishments' maximise, manage, measure, and communicate their social impact. Clients select us for our expertise and ability to connect at the grassroots level and thus create and deliver practical solutions for their unique requirements.

With its unique process excellence focus and experience, it has grown into being one of the most reputed social impact-consulting firm, with projects spread across the length and breadth of the country and boasting of who's who of client list, working with major industry names. Today, NuSocia is positioned as a social impact advisory at the intersection of Knowledge, Practice and Research and based on the core pillars of design thinking and collaboration. It works across the entire CSR lifecycle offering services in CSR strategy, needs assessment, programme design, implementation, monitoring and evaluation, impact assessments, communication, and more.

With a global consulting team, localised partnerships and 60% female workforce, NuSocia is committed to creating an inclusive and diverse environment focused on equality, empowerment and mutual respect.



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