

# Solidaridad



## ANNUAL REPORT

Solidaridad Regional Expertise Centre

2021-2022



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## FOREWORD

As I reflect on the past year and the remarkable journey of Solidaridad Regional Expertise Centre (SREC), India. With immense pride and gratitude, I present to you the Annual Report for the year 2021-22, documenting our endeavours, accomplishments, and impact.

We believe farming may be the most critical job. Where would we be without the producers of our food? On top of that, farmers can make all the difference regarding our planet's future. They are the stewards of our soils, vital for food production, climate mitigation, and adaptation.

But the Indian farmers face the twin challenges of land degradation, severe water crisis, low returns and low technology adoption. The income for the farmers is so little that they can't save, they have so little that they can't put up collateral for a loan, and they are unable to invest in their enterprise or education to increase their income. On top of it, climate change is expected to reduce yields in most states throughout this decade with the increasing frequency and intensity of extreme weather events like heatwaves and storms.

A growing consensus is emerging among soil scientists that regenerative agriculture holds enormous potential to restore soil health and productivity in degraded landscapes while delivering financial benefits to smallholder farmers. Regenerative agriculture also improves water use and efficiency by enhancing the health and nutrient-holding capacity of the soil. Studies have established that a one per cent increase in soil organic matter (an indicator of soil health) per 0.4 ha increases water storage potential by more than 75,000 litres.

The present Annual Report across different sectors like castor, cotton, dairy, soy, sugarcane and tea showcases the benefits for farmers of practising regenerative climate-smart agriculture. In Maharashtra, a significant achievement was to save 1.4 billion litres of water in the cotton landscapes through farm ponds, drips, and other water-saving methods.

The report also highlights how Solidaridad has intensified its usage of digital technologies across commodities. While the previous decade of the sustainability movement was focused on making physical commodity chains more democratic, more transparent and farmer-friendly, this decade is about making virtual supply chains (like blockchain) more democratic, transparent, inclusive and farmer-friendly.

Pollution currently poses one of the most significant public health and human rights challenges, disproportionately affecting the poor and the vulnerable. Exposure to air, soil, and water pollution is responsible for about 40 per cent of deaths worldwide. Solidaridad's leather sector interventions to reduce and eventually eradicate pollution in the supply chain provide new opportunities for the country's leather business. Not only it is reducing the cost of waste disposal, but by converting 'waste' into productive outputs, we are able to create new green jobs.

None of this would have been possible without the generosity and support of our donors, whose unwavering belief in our cause fuels our determination to effect lasting change. Your contributions, whether financial or in-kind, have empowered us to expand our reach and extend a helping hand to those who need it most.

Solidaridad's team working in the field deserve special recognition for their selfless dedication. You are the backbone of our organisation, working tirelessly on the ground, translating our vision into action, and spreading hope to the most remote corners of our country.

I also want to express my deepest gratitude to our partner organisations and institutions. Collaborative efforts and synergy are vital to creating a more inclusive and sustainable world. Together, we can amplify our impact and drive meaningful progress in areas that require collective action.

As we embark on the next phase of our journey, we are acutely aware of the continued challenges that lie ahead. The world of sustainability is constantly evolving, and so too must our approach and strategies. We remain committed to continuous improvement, learning from our experiences, and adopting innovative solutions to address emerging needs.

In closing, this Annual Report serves as a testament to the unwavering spirit of compassion, empathy, and resilience that defines Solidaridad Regional Expertise Centre of India. Together, we strive to build a brighter, sustainable future—one where farmers thrive, our planet flourishes, and communities prosper. With your continued support, we are confident in our ability to effect lasting change and make a tangible difference in the lives of those we serve.

Thank you for joining us on this transformative journey.



**Dr Shatadru Chattopadhyay**  
Managing Trustee  
Solidaridad Regional Expertise Centre

## MISSION AND VISION

Solidaridad envisages a world in which all we produce and consume can sustain us while respecting the planet, each other and the next generations.

Our mission is to work together with supply chain actors and engage them through innovative solutions in building a sustainable and resilient socio-economic framework that maximises benefit for all and ensures environmental harmony.

Solidaridad seeks to combat structural poverty the sustainable way. Poverty is often known to have its roots in low agricultural productivity among others. Low volume of agricultural produce leads to an imbalance between demand and supply that subsequently results in increased food prices, which pushes the poor, especially in rural areas, into further destitution, failing to meet the basic means of living. Rising demand for food, feed, fibre and fuel not only outbalances food prices, adding to the penury of a large number of people in rural areas, but also compounds the pressure on lands, threatening biodiversity and carbon rich natural landscapes.

By 2050, it is estimated that the world will have nine billion mouths to feed and a proportionate (and increased) number of people to support with basic subsistence. The need to produce more food with same amount of land and water has captured the attention of both private and public entities. In India, major local and global businesses in the agriculture supply chain have responded to the clarion call by

Solidaridad towards responsible and sustainable agriculture and trade — the only possible way to mitigate environmental depletion and ensure social, economic and environmental balance.

With a population running into billions, employment, food security, food safety along with prevention of environmental depletion are some of the pressing issues concerning India. Good and sustainable agricultural practices are therefore critical in manifesting changes in the social, economic and ecological frameworks of the country, especially its rural economy. Lack of access to inputs, poor planting material and rapid environmental degradation along with limited or no access to markets due to logistical or quality constraints are some of the predominant issues plaguing the farmers, especially smallholders, in rural India. Better farming condition is therefore key to creating a more inclusive and sustainable supply chain in the agriculture sector. Solidaridad has been a frontrunner in sustainable economic development, keeping up its pace with changing times. Recognising markets as pivotal to realise positive changes in the society and environment, Solidaridad looks at public-private partnerships as an increasingly important mechanism for testing innovations, speeding up change and taking success to scale. With improved scale and speed, Solidaridad aims to create a pervasive impact in society towards a more inclusive, climate-resilient and sustainable economy.





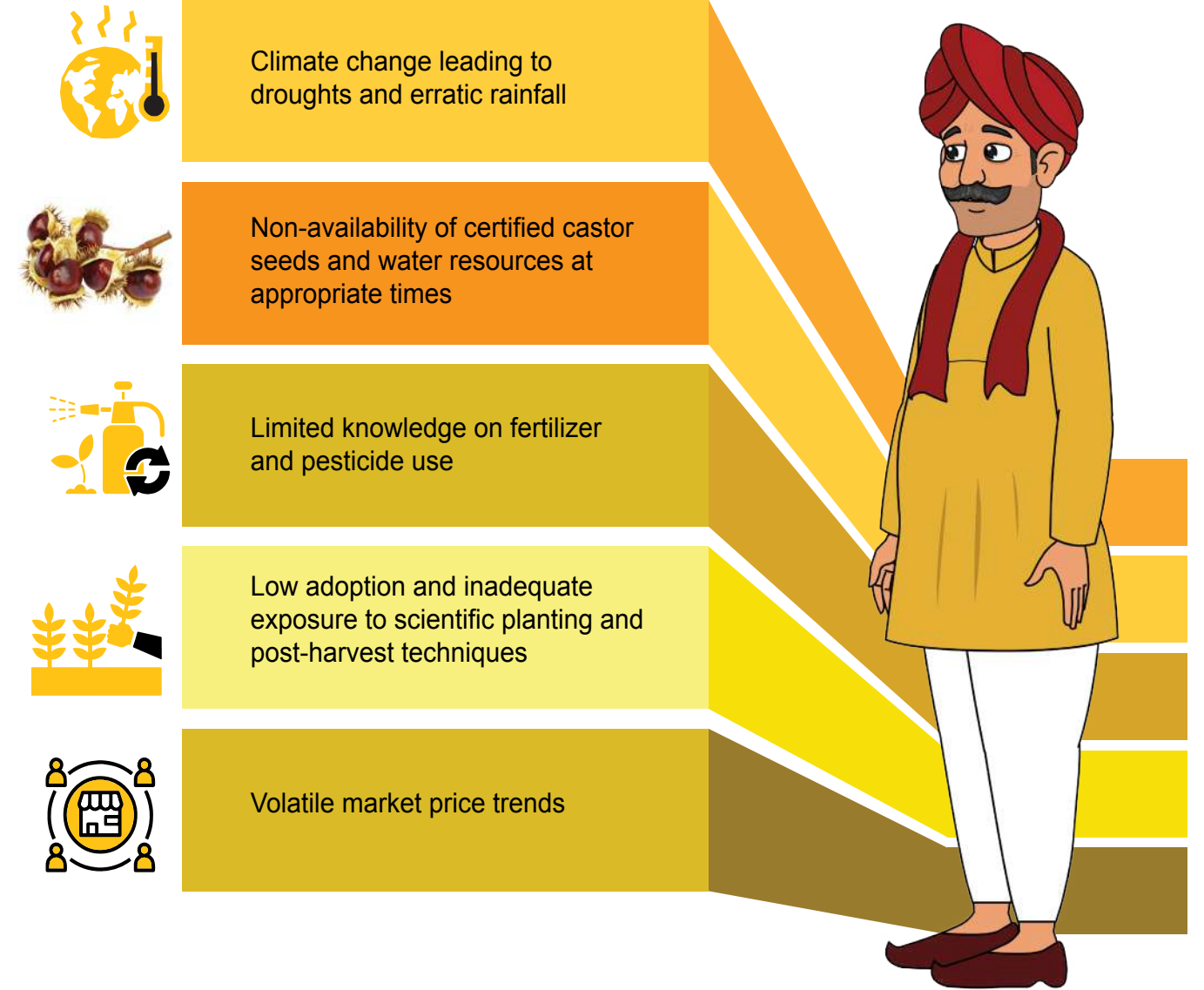
# CASTOR





## RAKING IT IN WITH SUSTAINABLE CASTOR FARMING

Castor is a remunerative, non-edible oilseed crop with an average of 47-49 per cent oil recovery. 90% of the world's supply of castor seed is produced annually in India, representing approximately 1.8 million tons. In India, the drought and pest-resistant castor crop finds favorable conditions for cultivation in Gujarat. Gujarat contributes to more than 85% of the production, approx. 1.5 million tonnes and is providing direct livelihood to an estimated 0.7 million castor producers. And yet, the castor farmers in India are distraught due to multiple challenges.



To address these challenges in the production sector, market trends and overall sustainability in castor farming, Solidaridad aspired to transform castor production practices in such a way that they provide fair and profitable business opportunities, guarantee decent working conditions, and a living wage and do not deplete landscapes where people thrive. In 2016, Solidaridad decided to expand its interventions in sustainable agriculture to include sustainable castor production in four of the major castor-growing districts in Gujarat, namely Sabarkantha, Banaskantha, Mehsana and Patan. Taking a multistakeholder approach, Solidaridad collaborated with global industrial partners - Arkema, BASF, and Jayant Agro-Organics Limited - to create a holistic programme, Sustainable Castor Initiative-Pragati, for the smallholder castor farmers. Pragati has engaged and trained more than 7400 castor farmers, out of which more than 6200 farmers have been certified under the sustainable castor code at the end of Phase II in 2021-22.

The initiative is aimed to improve productivity and sustainability in the castor supply chain in India, notably in Gujarat, thereby enhancing economic self-sufficiency and livelihoods of smallholder producers. It has also developed sustainability principles for castor which would guide and further allow the castor producers to offer certified sustainable castor in the global market.

## ON-GROUND IMPLEMENTATION

In spite of the pandemic bringing to a halt all the planned initial activities, when the lockdown was lifted in parts, the field team continued their outreach and engagement activities adhering to the safety and health guidelines.



**Capacity-Building Training Sessions:** Capacity building of farmers via regular training sessions on good agricultural practices (GAP) forms one of the main pillars of the programme. The on-field engagement, both through classroom training as well as practical training in demonstration plots, is significant in the dissemination of knowledge on sustainable castor production. These sessions are planned throughout the farming season. Scientific farming techniques through the lens of sustainability such as using certified seeds, soil management via soil test for efficient use of fertilisers and other agri-inputs, integrated nutrient and pest management, water efficiency through furrow and skip furrow irrigation methods, preserving on-farm biodiversity are imparted.

**Training of Trainers - Lead Farmers' Training:** The programme organised lead farmers' training from all the project districts in collaboration with agricultural universities such as the Sardarkrushinagar Dantiwada Agriculture University (SDAU) and Krishi Vigyan Kendra (KVK). These training sessions provided the farmers with the platform to engage with castor and agricultural experts and find solutions to their on-field challenges as well as effective ways to address agricultural problems brought in by climate change.



**Workers' Welfare - Training Sessions on Health and Safety:** The programme ensures that all its farmers and their workers maintain and follow proper working conditions in the field and avoid any health risks through training sessions and awareness meetings. Keeping the environment, health and safety guidelines in consideration, all the registered farmers were provided with waste management training on sustainable ways to ensure the safe use, reuse, and disposal of empty containers of chemicals, fertilizers and pesticides. Detailed training was also provided on the necessity of storing crop protection products (CPPs) in an efficient manner by farmers, especially smallholder farmers with limited space, to ensure no unauthorized persons like children can reach them and there is no contamination with food and water. Storage boxes with proper lock and key facilities have been distributed among farmers for safely storing CPPs.

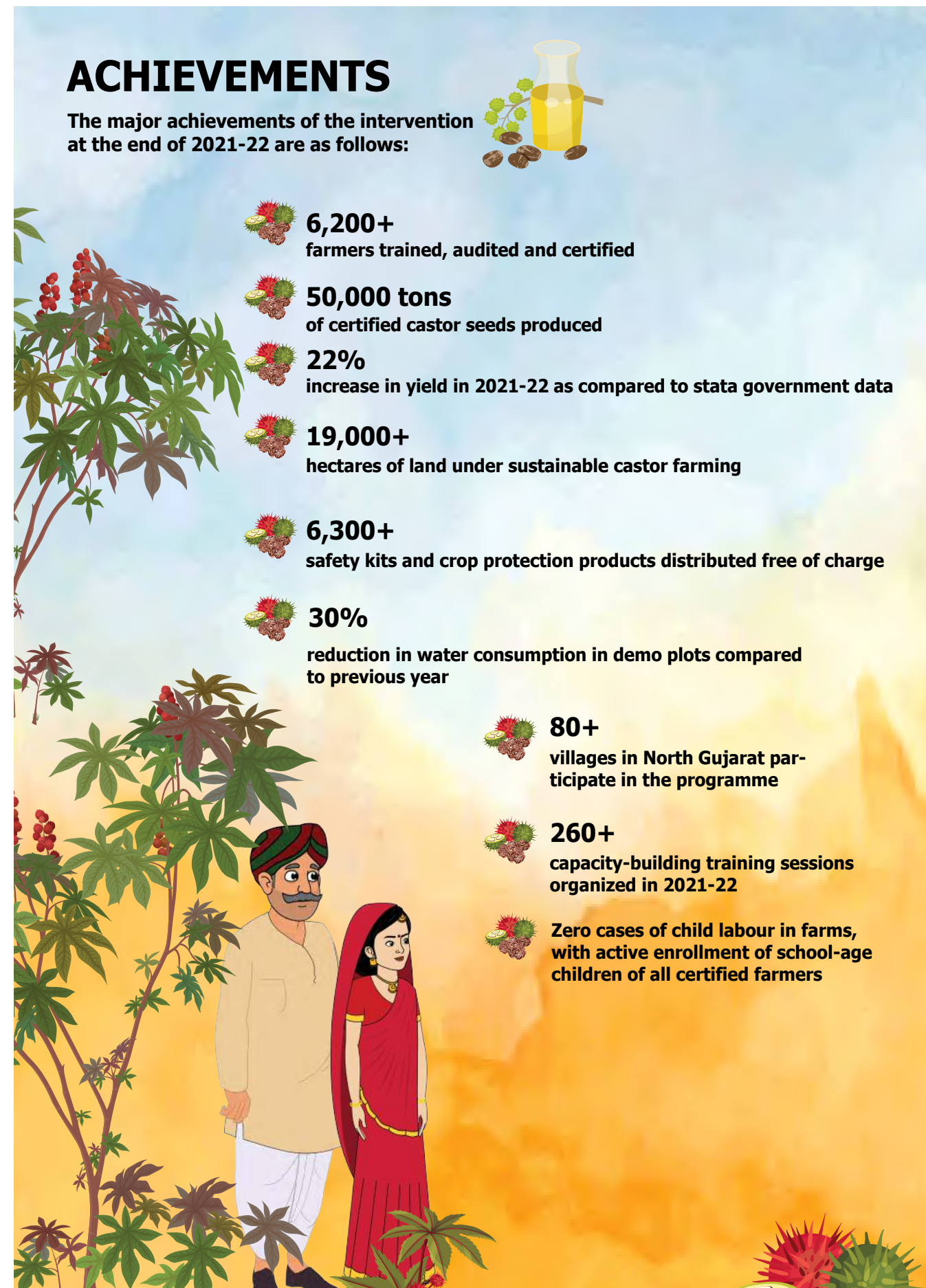


**Training on the use of personal protective equipment (PPE) kits** was provided to ensure farmers follow safety measures in agricultural practices, especially during pesticide spraying and plucking. Till now, approximately 6300 PPE kits have been distributed throughout the programme districts. Additionally, annual health check-ups for farmers and their families are also organised in all the project villages by medical professionals.

**Engagement with Women Farmers:** Identifying the undeniable contribution of women farmers to castor production in the state of Gujarat, Pragati ensured to take the first step towards engaging with women farmers in Phase II. Engagement sessions with women farmers have been conducted on areas of sustainable practices in castor farming, health guidelines and financial literacy to strengthen their position and improve decision-making power in their households. Awareness trainings on the dangers of child labour, eliminating its practice, and encouraging education for all children have also been organised.

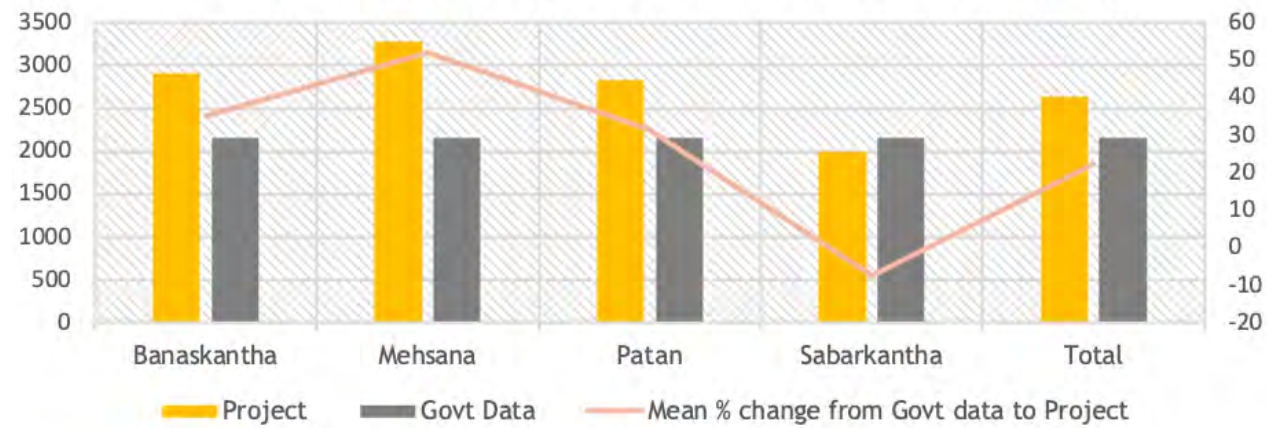
**Showcasing GAP in Demonstration Plots:** Demonstration plots articulate the principle of 'what works gets translated into sustained practice'. Thus, these plots are a platform to introduce new ideas and allow farmers to experience innovative practices on first-hand basis and dispel any inhibitions they might have around changing their traditional farming techniques. These plots encourage learning by doing, thus improving efficiency. They demonstrate that sustainable castor farming practices work and give confidence to farmers to shift from their traditional farming practices and adopt sustainable practices by minimising their risk perception. In phase II, the programme developed 25 demonstration plots in the four districts. These plots were aimed to demonstrate the effectiveness of water saving interventions along with other sustainable practices such as vermicompost.

Benchmarking and training farmers on good agricultural practices and thereby certifying them in sustainable castor framework have helped to improve the crop productivity and quality, along with improving soil health and increasing castor yield. At the same time, it has also substantially reduced input cost, thus leading to rise in income and improvement in the social and ecological landscape of the communities and creating prosperity among farmer families.





Yield (Kg per Ha) (Project vs State Average 2021-2022)



## THE CHANGE MAKER

## ENSURING FARMER AND WORKER SAFETY

Mayuddinbhai Ahmedbhai Shaikh, is a resident of Talepura village, Banaskantha district, who has been engaged in farming since 20 years. For the last 13 years he is growing castor as it is a remunerative crop in the local climatic and soil conditions. However, with the crop often getting affected by diseases and pests like blight and semilooper among others, he had been frequently using chemical pesticides by spraying or broadcasting.

The chemical pesticides were not only expensive but applying them was also taking a toll on his health. Shaikh's improper handling and exposure to the chemicals resulted in physical problems like itching, irritation in the eyes, skin rashes and bad smell on his hands. With no knowledge or access to personal protective equipment, he was exposed to adverse health risks like many other farmers.

In 2016, he came to know about the Sustainable Castor Initiative programme and joined the initiative to acquire knowledge and awareness of current good practices of castor farming. After attending the orientation session, he realized how the initiative touched many important components such as improving the livelihoods of farmers, ecological restoration as well as improved health and safety of farmers and their families. Through the training, he was made aware of the occupational health risks to farmers and workers and how to efficiently address them through the adoption of good practices to ensure health and safety of farmers on-farm and off-farm. Shaikh says, "After joining Pragati, I am careful about my safety as well as that of my family. I am using PPE kit in farming activities such as pesticide handling and spraying and harvesting. The training sessions have made me aware of avoiding exposure to the chemicals and wear appropriate clothes to cover my hands, legs and face. The use of the kit also helped me to work faster and cover more area compared to before when I had to take breaks in between chemical applications to get respite from the strong-smelling chemicals."





**COTTON**



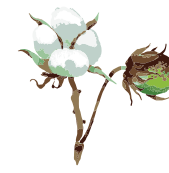


## PIVOTS OF CHANGE

The PFC Cotton Programme has made significant progress and achievements in 2022, emerging from the shadows of Covid and intensifying its activities on the ground. The project's main focus was on expanding its programme in Maharashtra and Telangana, scaling up from 5 to 9 districts of India, and reaching a total of 140,000 farmers. The programme aligns with various Central and State government initiatives in the agriculture sector, promoting production, productivity, soil health management, and climate-resilient agriculture.



## ACHIEVEMENTS



### Regenagri Certification

**17,000 farmers** covering 25,000 hectares of land adopted regenerative practices and got certified.

### Organic Certifications

**12,500 farmers** certified on 5,559 hectares of land

### Rejuvenation of Farm Ponds

**1,500+** farm ponds rejuvenated

**17,000 farmers** for regenagri on 25,000 hectares

**14 million litres** of water saved creating opportunities for additional crops.

### Water-use Efficiency

**20,000+** farmers adopted water-efficient practices

### Smart Agri Interventions

**140,000 farmers** reached through IoT solutions,

**1.4 billion litres** of water saved through farm ponds, drips, and other water-saving methods.

**120** bio-digesters installed producing 12,000 litres of organic manure daily

**1,500** compost bags provided to organic and regenagri farmers.



The project carried out the largest single regenagri certification of 8,000 farmers in the country, reaching a total of 140,000 farmers across Maharashtra and Telangana.

The adoption of the regenagri framework has unlocked carbon potential for the farmers, leading to potential carbon credit opportunities. The program aims to reach around 300,000 farmers and is exploring significant partnership opportunities in 2023.

The project's digitization efforts have transformed agriculture, making it more efficient, holistic, inclusive, and sustainable. Timely information accessibility has empowered farmers to make informed decisions and integrate traceable solutions into the value chains.

The project has continued its work on gender inclusion, reaching about 12,500 women farmers through various activities, including kitchen garden interventions and training on agricultural practices.

Crop diversification and alternate cropping systems have been promoted among farmers, generating additional income while reducing cultivation costs.

The programme increased the number of hi-tech demonstrations and agri-service providers/entrepreneurs, providing tailor-made advisories to farmers based on weather and soil data.

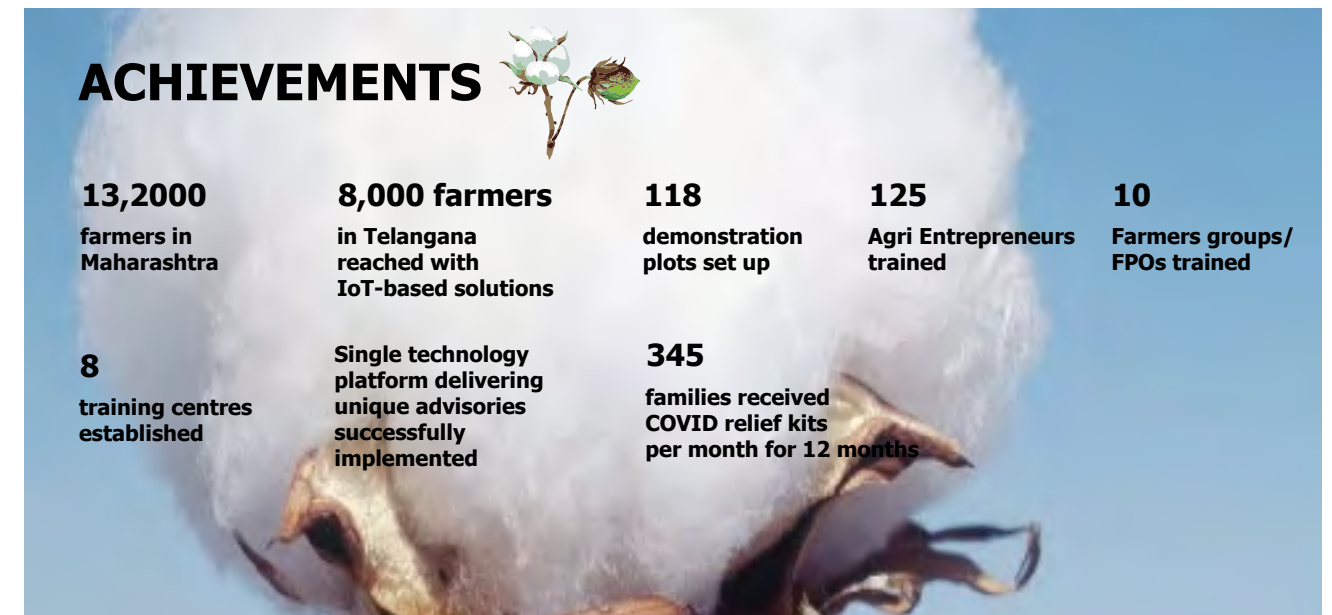
The PFC Cotton Programme has achieved remarkable progress in 2022, positively impacting the lives of farmers, promoting sustainable practices, and contributing to climate resilience and environmental conservation. The programme concluded in Dec 2022.

## SMART AGRI PROJECT PHASE -II

The Vodafone Idea Smart Agri Phase-2 project, funded by Vodafone Idea Foundation's CSR funds, aimed to enhance the livelihoods of farmers through improved practices by leveraging technology and IoT-based solutions in agriculture. The first phase covered Madhya Pradesh and Maharashtra, while phase-2 expanded to Rajasthan, Telangana, Assam, Uttar Pradesh, and included crops like mustard, cotton, tea, and sugarcane. The project targeted 2.7 lakh farmers through localized multi-crop advisories, weather stations, and digital literacy training.

### Objectives:

1. Consistently reach 2,70,000 farmers with localized multi-crop advisories.
2. Set up 14 weather stations supporting 300 hi-tech demonstrations with weather, pest, and soil data.
3. Capacity building of 2,70,000 farmers through Smart Agri Knowledge Centers and extension teams.
4. Develop 100 Agri-tech extension entrepreneurs.
5. Establish a single Agri Technology platform delivering unique advisory on multi-cropping systems.



The programme also enrolled another 80,000 farmers in the second half of 2022 as part of VIL-3 and is now covering 140,000 farmers in 9 districts of Maharashtra and Telangana with weekly audio agrometeorological advisories in not only cotton but other arable crops also. With its advanced technological features and timely reach to over more than 1345 villages the programme has helped the farming communities to plan and execute the operations better and has reduced the input cost by 12% to make the operations in agriculture more profitable.

The Vodafone Idea Smart Agri Phase-2 project has shown significant success in leveraging IoT-based solutions to empower farmers with technology and good agricultural practices. The project has reached a substantial number of farmers, improving their yields while conserving resources. The establishment of training centres and Agri-tech extension entrepreneurs has contributed to knowledge dissemination and long-term sustainability. The impact study will provide further insights into the project's effectiveness, ensuring continuous improvement and benefits for the farming communities.

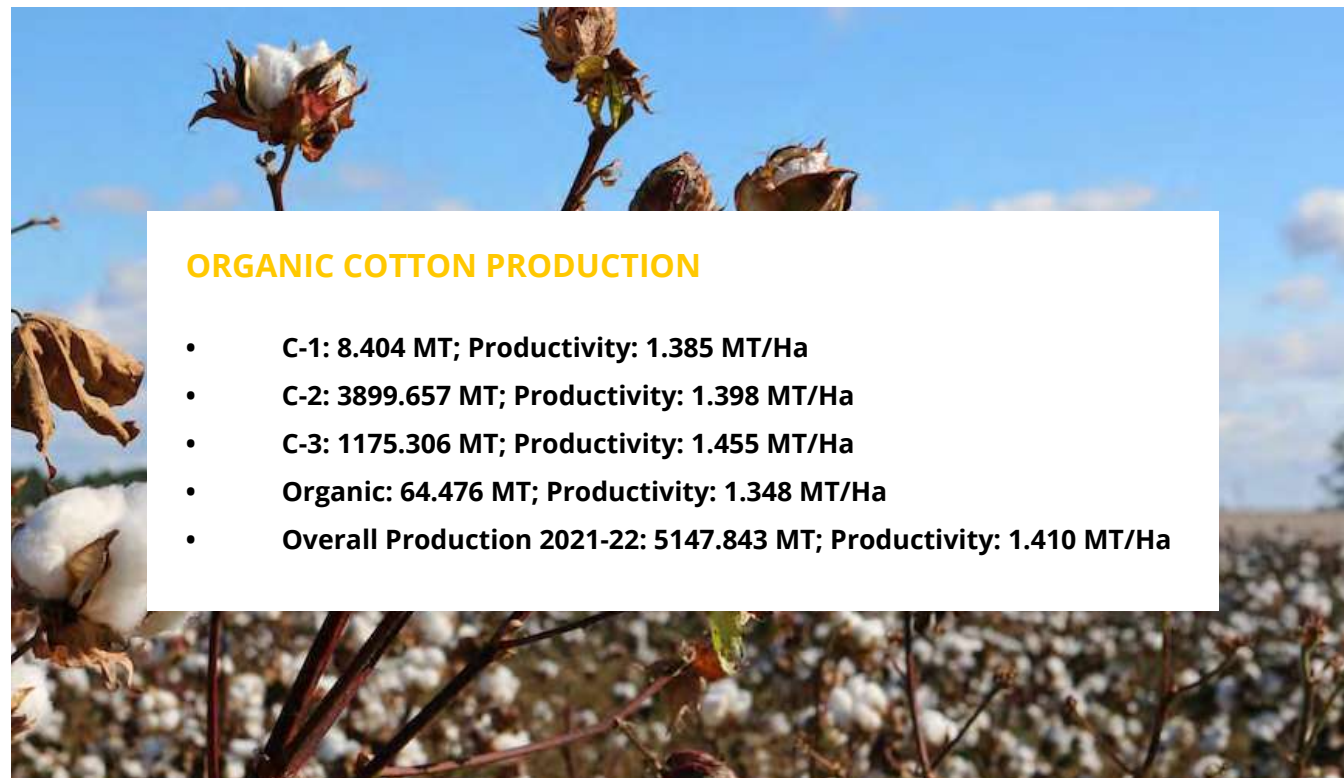
## ORGANIC COTTON HOTSPOT

The project aimed to promote organic cotton cultivation among 15,000 small and marginal farmers in Maharashtra, focusing on districts in the Vidarbha and Marathwada regions. The programme, initiated in 2018, facilitated organic certification for cotton farmers, and by 2021-22, a significant number of farmers were certified under various organic standards.



## ACHIEVEMENTS

1. Farmer Mobilization and Group Formation: Solidaridad worked with 12,494 farmers, grouped into 14 farmer producer organizations across five districts. The farmers received training on organic cotton production, cultivation of other crops, post-harvest management, and market linkages. Three new women-led Farmer Producer Organizations were established in the reporting year.
2. Enhancing Access to Organic Inputs: Farmers were trained on preparing on-farm inputs like compost, vermicomposting, seed treatments, and pest/disease management solutions. Approximately 1,000 training sessions were conducted on these topics.
3. Enhancing Availability of Quality Non-GM Cotton Seed: The program procured non-GM organic cotton seeds from Partech Seeds Pvt. Ltd. and distributed 12,500 seed packets to farmers in five districts.
4. Community Integrated Soil and Water Management: Water reserve groups were established, and farmers were trained on farm water management and rainwater harvesting. Around 59 farm ponds, 1 well, and 1 community farm pond were constructed/rejuvenated.
5. Market Linkages and Organic Certification: Arvind Ltd. engaged in the purchase of organic and in-conversion cotton from the farmers. A total of 612.876 MT of organic raw cotton was delivered to designated ginners. Additionally, other produce like soybean, pigeon pea, wheat, and chickpea were sold in the local and export markets.



## SUSTAINABLE DEVELOPMENT GOALS (SDGS)

The program interventions directly/indirectly contribute to SDG 1 (No Poverty), SDG 3 (Good Health and Well-being), SDG 10 (Reduced Inequalities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 17 (Partnerships for the Goals).

### Challenges

- The global pandemic and related travel restrictions affected the program's implementation and target of reaching 15,000 farmers.
- Farmers' payments were impacted by restrictions on banking services due to loan defaults.

The program's success is evident in the increasing number of certified organic cotton farmers and the adoption of sustainable practices in agriculture, contributing to better livelihoods and resilient communities in Maharashtra.

The programme will end in May- 2023.



## RECLAIM SUSTAINABILITY!

The RECLAIM Sustainability! Programme in India has made significant progress in promoting sustainable cotton and textiles. The program aims to create inclusive and sustainable value chains by considering the interests, rights, and voices of farmers, workers, and citizens. Some of the key achievements and interventions of the program in 2022 include:

**Private Sector Engagement:** The programme actively participated in the Organic Cotton Accelerator, a multi-stakeholder platform set up by brands to further the interests of the organic cotton sector. This resulted in the adoption of a standardized training curriculum and sourcing criteria for brands.

**National Platform for Regenerative Agriculture:** The program advocated for and successfully set up a national platform for regenerative agriculture. This platform led to the adoption of the Nagpur Declaration, which advocates for private sector sourcing based on regenerative agriculture principles and supports reducing greenhouse gas emissions significantly.

**Development of Traceability Tool:** The program supported the development of a traceability tool for sustainable cotton sourcing, which is set to be piloted in 2023 with brands like Kontoor..

**Capacity Building for Farmer Producer Organizations:** The program conducted capacity building activities for various farmer producer organizations, improving their governance systems and capabilities. This helped them actively engage in dialogues with other supply chain actors and decision-makers, leading to better negotiation positions and engagement in supply chains.

**National Natural Farming Policy and Budgetary Increase:** The program supported the implementation of the National Natural Farming Policy and contributed to securing a budgetary increase for the initiative.

**Formation of ACRE Platform:** The Alliance of Cotton & Textile Stakeholders on Regenerative (ACRE) platform was formed to promote regenerative agricultural practices in the cotton sector. The platform aims to collaborate among various cotton and textile value chain actors, raise awareness about regenerative cotton, engage in policy advocacy, and build capacity for wider adoption of regenerative practices.

**Nagpur Declaration and Regenagri Certification:** Over 25 organizations signed the Nagpur Declaration, committing to support regenagri-certified cotton. The program aims to achieve 50,000 tonnes of regenagri-certified cotton from the fields of 10,000 farmers to be used by 10 or more fashion brands.

**Shift in Policy Advocacy:** Due to setbacks caused by COVID-19 restrictions in China, the program shifted its focus from regional trade policy to advocating for private sector policies and government policies around sustainable farming and sourcing.

Overall, the program has made significant strides in promoting sustainable practices in the cotton and textile industry in India, bringing together various stakeholders and creating positive impacts on farmers, the environment, and the value chain as a whole.

## SHAPING A SUSTAINABLE FUTURE

The Sustainable Water Fund (FDW) project "Water Efficiency in sustainable cotton-based production systems in Maharashtra, India," made significant progress in promoting water-efficient practices and sustainable cotton production. The project is being implemented in Maharashtra, India, with project partners including Solidaridad Network Asia Limited, Welspun India Limited, BioCare Pvt. Ltd., and Technische Universiteit Delft (TU Delft).

The project continued its efforts to train and build the capacity of 20,000 farmers in the region. These farmers received training on Good Agricultural Practices (GAP) twice during the reporting year, covering every stage of cotton cultivation, from land preparation to harvest. Additionally, 4 new water user groups were established, bringing the total number of active water user groups in the project region to 17. These groups play a crucial role in water governance and will ensure the sustainability of water sources even after the project concludes.

The project successfully introduced smart agriculture practices using IoT-based advisories, which provided farmers with valuable information on irrigation scheduling, leading to optimum water application and better decision-making. Virtual and digital technologies were utilized to deliver crop advisories to farmers via WhatsApp video calls, SMS, and voice messages.

Furthermore, the project focused on the construction and rejuvenation of water structures, resulting in the conservation of 14.5 million m<sup>3</sup> of rainwater during the reporting year. As a result of adopting water-efficient practices, 10,000 hectares of farmland saw a water use reduction of 0.5 billion liters per year for crop irrigation.

**The project's impact extended to financial literacy and access, with 2,060 project farmers availing financial support for water harvesting structures and micro-irrigation. In total, 16,500 farmers adopted market-oriented cultivation practices, contributing to water efficiency, improved soil health, and increased returns on investment.**

**A midline survey, in collaboration with TU Delft, was completed during the year, highlighting improvements in financial literacy, cultivation practices, and yields. Additionally, a Randomised Control Trial method for surveying 2,400 farmers is planned in 2023 to enhance the understanding of key performance indicators.**



# DAIRY





## IN NEED OF A SUSTAINABLE SHIFT TO CLIMATE SMART

India is the highest milk producer and ranks first position in the world contributing 24% of global milk production in the year 2021-22. The dairy sector has been a major contributor to the growth of the rural economy in India. Despite the exponential growth of the dairy industry, dairy farmers face critical challenges such as little with least or no knowledge of advance good dairy practices to produce high quality and sustainability standards milk for the formal market, not enough income, shortage of feed and fodder, diseases among others. Dairy production places high demands on land and animals, and has environmental repercussions as well.



## CHALLENGES





## GENDER NON-INCLUSIVITY



Women play a significant role in the dairy sector they handle all aspects of the dairy work, such as feed management, dairy farm management, milking, animal care, and so on, yet they are not given credit. Women are essential contributors to development, playing a critical role in driving transformative economic, environmental, and social changes needed for sustainable progress. Unfortunately, men still hold significant decision-making power in many communities, prohibiting women from making decisions without their permission.

Yet, progress has been made through sensitization activities focused on community members and men. Women now participate in training and raise questions; their opinions are accorded the weight they deserve. This trend towards gender equality is crucial for long-term development because it allows women to fully engage in decision-making and actively drive good change.



## INTERVENTION

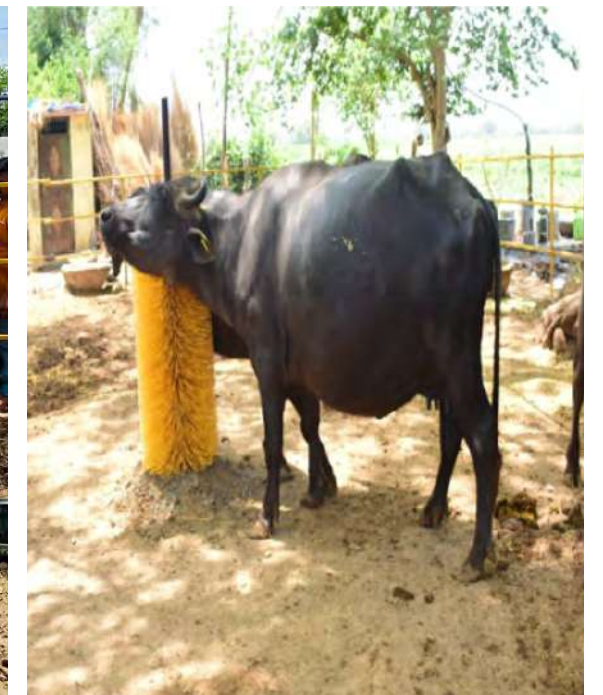
Solidaridad's focus in dairy is to make the dairy farmers' business more sustainable, biodiversity oriented, reduce GHGs emission from the dairy sector and connect consumers – farmers – dairy suppliers to bring a sustainable change. As 70% dairy farmers are women – our approach is to promote women friendly propositions. Solidaridad focused on loose housing system in dairy because largely in India – tied system of animals is followed. Loose housing is natural – improves milk productivity – reduces disease like mastitis – reduce input cost – reduce women drudgery and contributes to animal welfare.

Solidaridad in dairy brought innovative disruptions by developing a QR code system printed on bottle or packet of milk - scanning of which can show the consumers - sustainable practices being done by farmers at the farm level and quality practices being followed by dairy company. This gave a virtual platform to consumers – farmers and dairy suppliers to be connected.

Solidaridad is the first in India and Asia to get regenagri certification for dairy farmers through third party. This is one of the achievements towards GHG emission mitigation from the dairy sector.

With SAI Platform, Nestle, Unilever we piloted - using the Cool Farm Tool to measure the GHG emission mitigations from the dairy farms. We have clearly calculated 20-25% reductions through simple, scalable propositions. Animal friendly pregnancy testing system has been used which can be done at a very early stage to save on loss of number of days if animal is not pregnant and reduce inter calving period.

Solidaridad is working with 30000 dairy farmers majorly women in three states of India – Maharashtra, MP and UP, in partnership with Reliance Foundation, USAID, SAI Platform, Nutreco, IVRI, Chandra Shekhar Azad University of Agriculture and Technology, Agriculture Development Trust, Nestle, Unilever. Dairy companies like NOVA Dairy, Govind Milk, Namaste India and support from the embassy of the Netherlands in India.



## INTEGRATED APPROACH TOWARDS EMPOWERMENT

The economic situation of rural farmers is dire, to improve their financial condition, women were provided with financial literacy training as they worked extensively in the dairy sector. To further support women in the dairy sector, Solidaridad created a platform to streamline the sale of milk from farmers to Namaste India Foods (NIF) which gives them a fair price for their milk.

This initiative involved the opening of bank and mobile wallet accounts for farmers, which were then linked directly to the milk collection center. The platform ensured that farmers receive a fair price for their milk, which increase their income and improve their livelihoods. Additionally, they were able to save money in their accounts, resulting in a more stable financial situation and a respectable standard of living.

Solidaridad has distributed loose house material of Rs. 25000/- to develop loose house to 25 dairy farmers from 9 clusters of the project area in Maharashtra as well as 7 loose housing has been developed in Uttar Pradesh. Loose housing enhanced milk yield and increased the income of farmers. Farmers received training on how to make silage. After the training, 70 % of dairy farmers made and use silage for their cattle which increases milk productivity. It also benefits dairy farmers by reducing expenditure on feed and nutrition.

Women in rural areas are primarily responsible for household chores, child development, and caring for elderly family members. Women are frequently confined to their homes due to traditional beliefs and limited opportunities, making it difficult to persuade them to attend training programs.

Frequent visits were made to villages on a regular basis to educate the male members of the families. Sensitisation of males and community members eventually persuaded them, to allow women to participate in the trainings. Women can now sit beside men and speak in front of them. Earlier they veiled their faces, but now they just cover their heads. Soft skill training was given to women dairy farmers, and gender sensitization programmes were organized for dairy farmers. Initiated a way towards a women entrepreneurship program to get the involvement of women dairy farmers in the project. Various training, social activities, and programmes were organised to Increase women dairy farmers' involvement in dairy farms. Initiated an entrepreneurship model to create extra income for women dairy farmers.



## TRACEABLE DAIRY FARMING

Under the Trust Dairy project in Maharashtra, Solidaridad, in collaboration with Nutreco, Govind Milk and Milk Products Pvt. Ltd., and Agricultural Development Trust Baramati, launched a traceability feature for the dairy sector. The traceability programme will increase customer transparency and quality assurance by connecting them with farmers and industries. By documenting quality and sustainability practices undertaken by the processor and producer, the feature will promote visibility and transparency in the dairy supply chain. Consumers will be able to get the information by simply scanning a QR code.

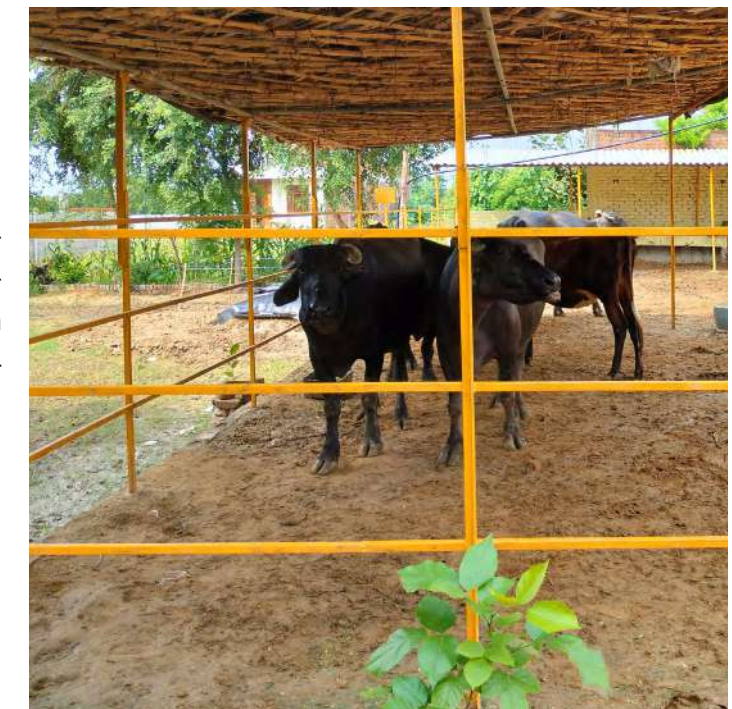


## FINANCIAL AND DIGITAL LITERACY

Financial and digital literacy is essential for empowering women in rural communities. However, during our visits, we discovered that many women had little knowledge of saving and were unfamiliar with digital transactions. To address this, the team gave these women digital and financial literacy training. As a result, women now have control over their funds and have improved their overall living standards, which has proven tremendously useful.

## EFFICIENT FARM MANAGEMENT

Loose housing was a new system developed in Maharashtra and Uttar Pradesh that was cost-effective and beneficial for the better health of cattle. Designed a cow health book for dairy farm bookkeeping data in order to transition to professional dairy farming.



## ACHIEVEMENTS

**10000**

Capacity Building on Good Dairy Practices of Dairy Farmers

**1500**

Linkage to the formal Transaction system

**8000**

Capacity Building through IVR

**70**

Community Mobilisers/ Advocate

**2000**

Financial Literacy Training

**1500**

Linkage to Market (VLCC)

**2000**

Digital Literacy Promotion and outreach

**47**

Loose house developed

**800**

Silage made

**1200**

Adopted dry matter-based feed for animals

**307**

Biogas installed

**60**

Training on Prom fertilizer

**60**

Training of women dairy farmers on soft skills and entrepreneurship



## THE CHANGE MAKER

## SOLUTION OF MASTITIS THROUGH CLEANLINESS PRACTICE IN DAIRY

Poonam Devi is a resident of Kulgaon village district of Kanpur Nagar. Her family's main occupation is dairy farming. During summer, one of her cattle produced less milk because of frequent illness and Thanella (Mastitis) infection. There was a significant reduction in milk production, 2 litres per day and the milk was unhygienic. Earlier, they were dependent on the local veterinary doctors who used to visit them and provide traditional and mediocre services, costing them approximately Rs 4000 annually per cattle for home visits and medical expenses. After attending training programmes organised by Solidaridad, Poonam Devi started adopting good practices, paying special attention to the maintenance and cleanliness of the animal's space and floor. As per the instructions given by the dairy experts She changed the method of milking, cleaning of hands and udder. Now as soon as any mild symptoms of the disease appear in her cattle, she consults Solidaridad dairy experts, free of cost using the 24\*7 helpline number provided to her and starts the treatment of their cattle accordingly. By giving proper attention, the cattle are now in good health and there is an increase in both milk production and income making a net profit of 2100 rupees per month.



	Before Mastitis	During Mastitis	After treatment
Milk production per day (Lts)	10	8	12
% Of milk production	100 %	20% reduction	Increased by 20%
Income per day	350	280	420
Monthly income	10500	8400	12600



# LEATHER





## THE POLLUTION CONUNDRUM

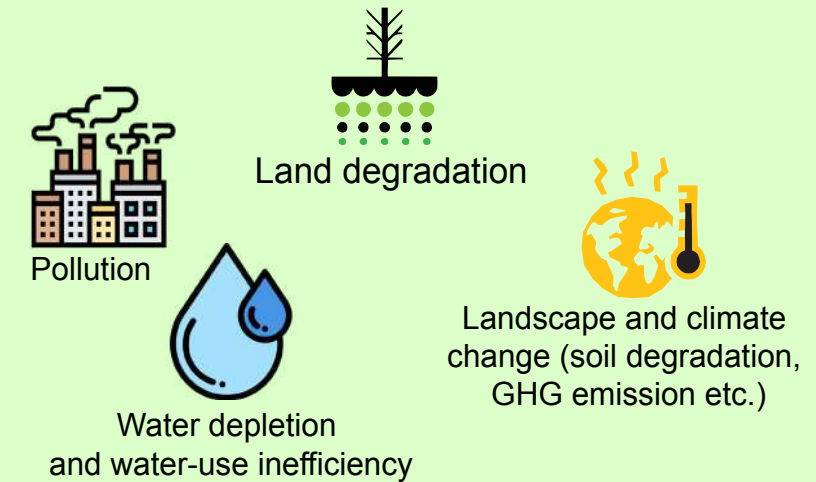
An erstwhile formidable market in India, mainly for export of its leather products, the Kanpur-Unnao region has been in constant social, political and environmental conundrum for its contribution to pollution, especially in the river Ganga, which runs through Kanpur in Uttar Pradesh. After the launch of the Government of India's ambitious 'Namami Gange' programme in June 2014, which aims at abating pollution in Ganga and restoring its vitality, the leather industry in the region has come under stricter lens from both the central and state pollution control boards and other regulatory bodies. The inability to adhere to statutory environmental compliances as set by the regulatory bodies has led to a prolonged closure of tanneries as ordered by the National Green Tribunal (NGT). This crackdown on the tanneries is a huge blow to their revenue and has



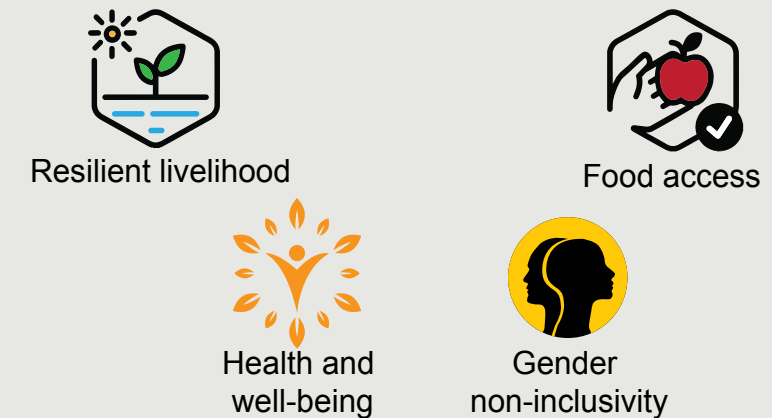
rendered many workers jobless. The nature of work in the tanneries exposes the workers to harmful chemicals, which compromises their safety conditions, leading to poor occupational health. Also, the farming communities downstream of the Ganga are significantly affected due to the polluted water released from the upstream industries. Despite the installation of common effluent treatment plants (CETPs), the water reaching downstream has remained laden with toxic effluents affecting crops and livelihoods downstream. The agriculture and dairy productions have seen a sharp decline over the past decade in the region. Adoption of advanced and clean technologies to comply with the pollution norms has become essential for the survival of tanneries. The Kanpur-Unnao leather cluster in Uttar Pradesh is particularly mired in pollution issues. Solidaridad, under this project on strengthening value chain of the Kanpur-Unnao leather cluster, aims at not only reducing the pollution load discharged from the tanneries, but also reducing its water consumption in its operations.

## CHALLENGES

### ENVIRONMENTAL CHALLENGES



### ECONOMIC AND SOCIAL CHALLENGES

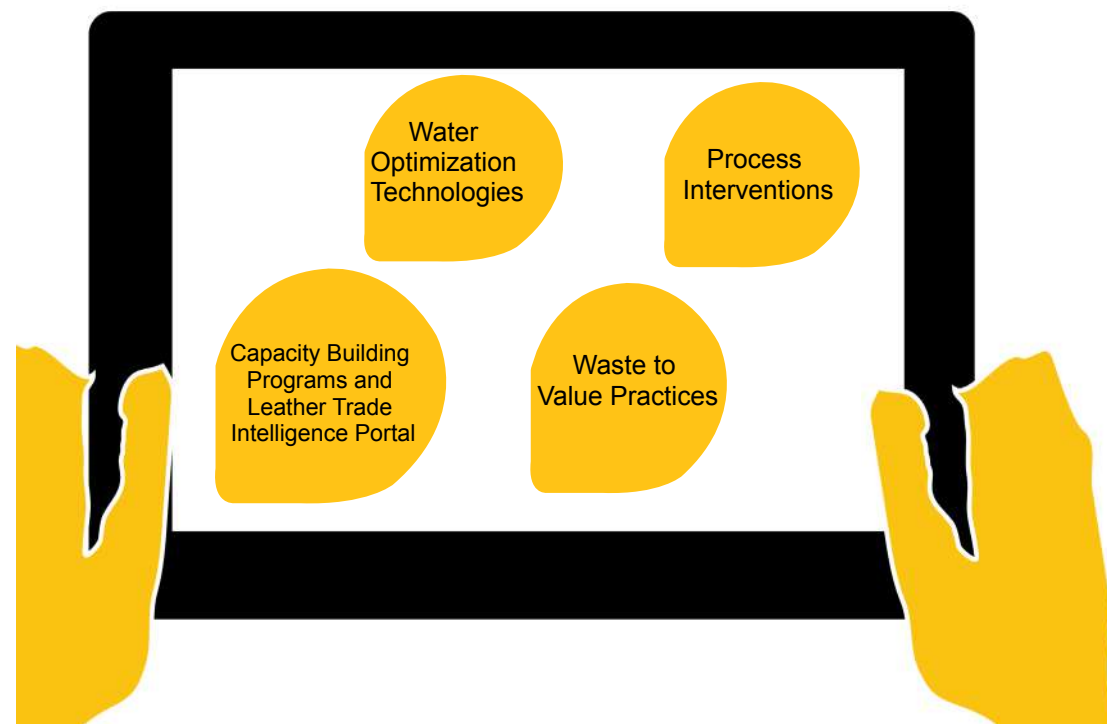


# SUSTAINABLE TRANSFORMATION

The “Pollution Prevention and Efficient Water Use in Kanpur-Unnao Leather Cluster” project has a primary goal of addressing pollution and water-related challenges in the Kanpur-Unnao region, specifically originating from tanneries and inefficient water usage. The Kanpur-Unnao leather cluster holds historical significance as one of the country’s oldest industrial clusters, employing traditional machinery, production methods, and approaches. While some tanners have begun modernizing their practices, the majority still operate in a manner reminiscent of ancient times. The project follows an approach involving pilot testing of interventions to reduce wastewater, convert waste into valuable resources, and optimize processes. Once the pilots achieve a certain level of success, Solidaridad scales up these interventions in other tanneries. This approach has significantly reduced pollution stemming from the tanneries. One of the significant challenges lies in changing the behaviour of individuals working in the sector, as the transition is gradual but is starting to yield positive results. Efforts are also being made to address gender non-inclusivity in tanneries through capacity building programs specifically designed for women.

The “Pollution Prevention and Efficient Water Use in Kanpur-Unnao Leather Cluster” project implemented various technologies and interventions to address pollution and water-related challenges in the Kanpur-Unnao region. These interventions garnered significant interest from tanneries, leading them to approach Solidaridad for further assistance. A noticeable change in the tannery owners’ mindset regarding the environment has been observed. The project not only focuses on environmental benefits but also promotes gender equality in the region.

## INTERVENTION



Solidaridad introduced several technologies to optimize water usage in tanneries, including the use of solenoid valves, water flow meters, and the Smart Water Saving System (SWaSS). These technologies resulted in significant water savings during various processes, such as fleshing and drum operations.

Solidaridad implemented a range of process interventions to reduce pollution parameters in the cluster. These included enzymatic dehairing, low salt pickling, bar screens, drum screens, electrooxidation technology, and desalting machines. These interventions significantly reduced the generation of noxious gases, total dissolved solids (TDS), suspended solids (TSS), and other pollutants from the tanneries.

Solidaridad implemented waste to value practices by introducing pilot tallow extraction plant, biogas plant, and paver blocks made from lime sludge waste. These interventions aimed to convert solid waste into valuable resources, such as fleshing to tallow, biogas for energy production, and paver blocks for construction purposes.

Capacity Building Programs, OHS Training Programs, and Leather Trade Intelligence Portal: Solidaridad established a Centre of Excellence (COE) to provide technical assistance and capacity building programs for tannery workers and supervisors. They also implemented an occupational health and safety (OHS) program to improve work conditions and conducted OHS workshops in tanneries. Additionally, Solidaridad developed the Leather Trade Intelligence Portal, an online platform that provides comprehensive information about tanneries’ production capacity, eco-friendly practices, safety measures, and water management initiatives.

The efforts of the Solidaridad Leather Project in the Kanpur-Unnao Cluster have brought about significant positive changes, not only in terms of environmental impact but also in promoting sustainable practices, worker safety, and the use of innovative technologies in the leather industry.

### STRENGTHENING THE TANNERIES WITH CLEAN TECHNOLOGIES

Our interventions in the cluster are unique and custom tailored to the need of tanneries. Bar Screen are made up of corrosion resistant material and are inclined at certain angle so as to not clog easily. The enzymatic trials conducted by Solidaridad have proved to be vital for the industry, as Solidaridad successfully conducted the trials on bulk lot as well with desired result. The pilot plant to convert the fleshing into tallow oil, waste trimmings to bonded leather and limed sludge to pavor block has showed the sustainable waste to value practices.

Our interventions have also used modern technology of PLC based automated dosing system to fill the tanning drums with desired level of water and counting it to the last drop.

The efforts of the Solidaridad Leather Project in the Kanpur-Unnao Cluster have brought about significant positive changes, not only in terms of environmental impact but also in promoting sustainable practices, worker safety, and the use of innovative technologies in the leather industry.

# ACHIEVEMENTS KANPUR

<b>547</b>	<b>100</b>	<b>92</b>	<b>92</b>	<b>5</b>
tanners and workers trained	tanners pledged to adopt responsible practices	solenoid valves	water flow meters	Smart Water Saving Systems installed
<b>79</b>	<b>52</b>	<b>10</b>	<b>6</b>	<b>5</b>
tanneries adopted bar screens	desalting machines installed and adopted	tanneries adopted Enzyme Assisted Dehairing	tanneries adopted the LTIP,	locations display paver tiles made from sludge

## SOLENOID VALVE (FOR 100 HIDES/DAY CAPACITY)

No. of Units/ Flow Meters	Per Year Water Saved in Million Liters
<b>95</b>	<b>18.81</b>



## WATER FLOW METER (FOR 100 HIDES/DAY CAPACITY)

No. of Units/ Flow Meters	Per Year Water Saved in Million Liters
<b>152</b>	<b>175.89</b>



## SMART WATER SAVING SYSTEM (FOR 100 HIDES/DAY CAPACITY)

No. of Units/ Flow Meters	Per Year Water Saved in Million Liters
<b>29</b>	<b>54.00</b>

Per Year Water Saved in Million Liters

**Total Water Saving Potential Each Year 248.70**

## Desalting Machine

No. of Units/ Flow Meters	Desalted Salt (In Tonnes)
<b>52</b>	<b>3,744</b>



**This Salt is Equivalent to:**

**Environment Protection:** Preventing 107.54 million litres of water each year from becoming saline (Considering avg. salinity of 3.5% or 35 Gram of Salt Per Litre of Water).

- Carbon Footprint Reduction: Reduces the carbon footprint by 374.4 Ton of CO<sub>2</sub>e by reducing the requirement and promoting reuse of salt (Carbon footprint of Salt production is 0.1 kg of CO<sub>2</sub>e/kg).
- Co-funding: The enthusiasm displayed by tanners is evident, as they have stepped forward and are contributing in a 50:50 ratio.

## Pilot- Tallow Extraction Plant:



- Environmental Benefits: This pilot plant is saving 335.7 ton of animal fleshing every day from being disposed in landfills causing soil pollution.

- Carbon Footprint Reduction: Carbon footprint reduction by 2,09,476.8 Kg of CO<sub>2</sub>e (As per the data published by United Nations Industrial Development Organization, each ton of fleshing from tannery produces 624 Kg of CO<sub>2</sub>e emissions.)
- Economic benefits: Providing employment to 4 persons throughout the year and producing raw material for various other industries.

## Enzyme Assisted Dehairing



This remarkable achievement led to a 95% reduction in the risk of people facing Hydrogen Sulphide Toxicity, reflecting a profound commitment to ensuring no life is lost due to negligence.

## Bar Screen & Drum Screen



Environmental Benefit: 6,570 Ton of organic solid waste prevented from entering the river stream each year. This has tremendously reduced the BOD in the effluent while also reducing the chances of clogging of downstream equipment.

## PILOT- TALLOW EXTRACTION PLANT



Using custom tailored innovative technologies, the project successfully achieved more than a 40% reduction in water usage through its interventions, as well as reductions in TDS, sulphide, BOD, and COD through process interventions in beam house. The project's success was due in part to regular engagements with stakeholders and MSP meetings where progress, challenges, and solutions were discussed.

Overall, Solidaridad Kanpur's project is successful in providing economic, technical, and commercial solutions to reduce pollution parameters and water usage in the leather industry, ultimately contributing to the preservation of the holy river Ganga.

## INNOVATION FOR CHANGE

### Pilot Tallow Extraction Plant

In Kanpur, the mismanagement of fleshing waste has been a pain point for the industry. There is no proper channel for disposal, and the unsustainable methods in practice lead to many problems. For example, the high organic content in the waste causes foul odour, which can make life unbearable for nearby residents. The traditional tallow extraction process is time-consuming and inefficient, resulting in significant waste of resources. However, after conducting intense research, Solidaridad has managed to increase the efficiency and sustainability of the existing process by making some modifications to it. Solidaridad's innovative approach involves cooking the fleshing waste with steam at a precise temperature. This separates the fatty material from the fleshing, which then starts to float on top of the reaction chamber. The remaining fatty matter is separated, filtered, and purified using diluted sulphuric acid, which is readily available in the market. The result of this process is tallow, a valuable commodity in the market which is widely used in India for making soap and other products. Solidaridad estimates that from every 1,000 kilograms of wet fleshing, around 25-30 kilograms of tallow can be recovered. By implementing this innovative process, Solidaridad is not only creating an economic opportunity for the local tanners but also reducing the environmental impact of the leather industry, particularly caused by the disposal of fleshing.

## BONDED LEATHER PRODUCTS



## LIMED SLUDGE TO PAVOR BLOCKS



### Enzyme Assisted Dehairing

This process uses protease enzyme and reduces the amount of sodium sulphide in the dehairing process, which eliminates the production of hydrogen sulphide gas and reduces pollution. The enzyme-based dehairing method removes hair from hide/skin and filters out the undissolved hair from the effluent, reducing its chemical oxygen demand. Solidaridad has supported the development and application of proteolytic enzymes in the Kanpur-Unnao Leather Cluster to improve dehairing methods and offer alternatives to chemical processes. The conventional dehairing process using sodium sulphide and lime causes pollution by dissolving the removed hair in water and also one of the prime reasons of production of Hydrogen Sulphide gas in effluent treatment plant. Solidaridad conducted successful research and development trials to develop a low sulphide dehairing process using enzymes, optimizing enzyme amounts for complete hair removal. The enzymatically dehaired leather maintains comparable properties to conventionally produced leather while significantly reducing pollution indicators. Solidaridad performed enzyme-assisted dehairing trials in a tannery, achieving satisfactory results with good quality pelt and no hair residue.



## TESTIMONIALS



Experience with electro oxidation technology is currently undergoing standardization. Our journey began with the intention of becoming an independent tannery inside the cluster. Numerous tests were conducted to evaluate the quality of leather and reclaimed water after installation of 40 KLD plant. Performed enzymatic de-hairing with recycled water with positive results. We are hopeful of our vision as were closing working towards achieving full capacity and technical parameters like TDS.

**Mr. Amir Ausaf**

Production Manger- M/s Kings International



The intervention is reasonable and has a substantial effect, earlier, workers considered it difficult to use, but now they are obliged to record readings and supply the appropriate amount of water depending on the process. This has helped me acquire a better knowledge of the quantity of water consumed in each drum. Not only do I find this intervention to be cost-effective, but I am also among the expanding number of persons who are adopting cleaner and greener technologies.

**Mr. Ahmar Ahmed**

Joint managing director M/s Supreme tanning industries



The works collectively done by solidaridad towards the alleviation of pollution at the source is really great. Desalting has really helped us in the reduction and reuse of salt than our conventional methods.

**Mr. Sarvanan**

Rehman Industries Limited



Results on Enzymatic trials are at par with conventional lots and swelling and plumping is equivalent to regular lots. Little bit of fine tuning needs to be done and there is complete hair removal.

**Mr. Izhar Alam**

Incharge-Beam house M/s Kings International



Being the pioneers in implementing Sustainable technologies, Low salt pickling has been adopted in both Cow and buffalo substrates and multiple lots of production has been done. The costing & commercial aspects should be taken care of.

**Mr. Amir Ahmed**

Managing director - M/s Shalimar Tanning Industries

## DONORS AND PARTNERS



## AWARDS AND RECOGNITIONS



Solidaridad has been awarded the **'Water Sustainability Award 2021-2022'** for its innovative approach to water technology by retrofitting the fleshing process in leather manufacturing, resulting in reduced water consumption. The prestigious TERI-IWA-UNDP award was presented by Mr. Bharat Lal, Secretary of Lokpal of India and former Secretary of the Ministry of Water Resources, Government of India, and Ms. Shoko Noda, UNDP Resident Representative in India. The award ceremony took place on World Water Day 2022.



**The Global Goods Award, 2022:** Solidaridad has been awarded the esteemed Global Good Award in the category of Community Partnerships on 13 October 2022 for its commendable work in the FDW Kanpur-Unnao Leather Project, which aimed to prevent pollution and promote efficient water usage. The Global Good Awards, previously known as the National CSR Awards, have been honoring sustainable and responsible practices since 2015. The Community Partnerships category had seven nominations, and the leather project was selected as the winner by a 39-member jury due to its strong community engagement and potential for replication. The award ceremony was held in hybrid mode in London.



## RED ALERT- BANTALA CLUSTER

India proudly claims the title of the second-largest exporter of leather garments, a feat exemplified by the substantial export value of 5.74 billion US dollars in footwear and leather products during the period of 2017-18. Furthermore, the nation's prowess extends to the domain of saddlery and harnesses, standing tall as the third-largest exporter in this segment, with its primary markets rooted in prominent countries such as the US, the UK, Germany, Italy, and France. Within India, Kolkata emerges as a dominant player in the leather industry, solidifying its position as the second-largest producer of leather, notably concentrated in the Bantala region. This thriving industrial hub operates under the organizational banner of the Calcutta Leather Complex Tanners Association (CLCTA), unifying the Micro, Small, and Medium Enterprise (MSME) tanning enterprises. Regrettably, it is essential to acknowledge that this segment of the tanning industry is categorized as "red" by the Central Pollution Control Board, Government of India, signifying critical levels of pollution. Specifically, the industry generates substantial quantities of highly polluting solid waste in the form of fleshings, off-cuts, and sludge.

Despite its impressive achievements and undeniable potential for expansion into the European Market, the leather industry faces formidable obstacles, particularly concerning environmental and public health risks due to the alarming pollution levels. These concerns must be diligently addressed to ensure the sustainable growth and reputation of this vital economic sector.





### Landscape

- Water consumption and pollution
- Chemical pollution
- Energy consumption and green house gas emissions
- Waste management

### Climate Change

- Livestock Rearing
- Energy Consumption
- Chemical Usage
- Waste Generation

### Pollution

- Wastewater Pollution
- Solid waste Pollution
- Chemical Pollution
- Air Pollution
- Energy Consumption
- Hazardous waste

### Water depletion and water use inefficiency

- Unaccounted Water Usage
- Lack of Monitoring System
- Unorganized Facility Layout
- Mindset of the Tanners
- Limited Adoption of Water-Saving Technologies
- Inadequate Water Reuse
- Lack of Awareness and Education
- Unorganized Production Process

- IV. The prevailing high temperatures and humidity further exacerbate the challenging conditions under which these workers operate.
- V. Compounding the problem, the tannery workers are frequently deprived of essential personal safety equipment, such as goggles, gloves, and protective clothing.
- VI. Throughout the tanning process, the workers are exposed to harmful dust and hazardous chemicals present in the processing baths, leading to various health problems.
- VII. Skin rashes, respiratory issues, and eye irritations are commonly reported among the workforce in the tanning industry.
- VIII. A comprehensive study conducted in 2015 by the Entrepreneurship Development Institute of India revealed that the lack of adherence to international social compliance standards and the persistently unsafe working conditions were key factors impeding the international competitiveness of the Bantala Leather Cluster.
- IX. Implementing stringent safety measures and conducting regular training sessions to raise awareness about potential hazards among the workforce.
- X. Encouraging tannery owners to invest in proper safety equipment and facilities to ensure the well-being and productivity of their employees.
- XI. Collaborating with relevant government bodies and organizations to enforce adherence to international social compliance standards, promoting a safer work environment.
- XII. Establishing health monitoring systems to track and address the health issues faced by tannery workers, ensuring timely medical attention and support.
- XIII. Fostering dialogue between industry stakeholders, workers, and community representatives to address concerns and implement sustainable improvements in working conditions.

## ECONOMIC AND SOCIAL CHALLENGES

### Health-and-well-being

- I. The tanneries located in Bantala play a crucial role in providing significant employment opportunities to a large number of low-skilled workers.
- II. Unfortunately, the working conditions within these tanneries often pose serious risks, as the employees frequently find themselves in unsafe environments.
- III. One of the primary issues is the lack of awareness and knowledge among the workers about potential hazards.



## GENDER NON-INCLUSIVITY

- Limited Representation in Leadership Positions
- Gender Bias in Hiring and Promotions
- Occupational Segregation
- Lack of Gender-Friendly Work Environments
- Limited Access to Training and Skill Development

## PROGRESSIVE STEP TOWARDS A SUSTAINABLE FUTURE



- Desalting Machines
- Enzyme-assisted Dehairing
- Water Optimizing Mechanism
- Digital water flow meter
- Low salt tanning technology
- Tallow Extraction
- Manufacture of Paver blocks/tiles
- Bonded Leather Sheet
- Buffing Dust Utilization
- Occupational Health and Safety Training
- Eye Camps
- Gender Sensitization

## ACHIEVEMENTS



**50**  
tanneries adopted mechanical de-salting process

**5**  
tanneries adopted enzyme assisted dehairing

**100**  
tanneries installed solenoid valve & limit switch

**15**  
tanneries conducted trial of low salt tanning

**5**  
tanneries conducted trial of sin aqua tanning

**4**  
fire safety camps conducted

**5**  
workshops conducted on gender sensitization

**1**  
tannery adopted dewatering machine

**27**  
tanneries adopted accurate weighing system

**1**  
tannery adopted SwaSS

**20**  
tanneries adopted water flow meters

**1**  
tannery adopted rotate drum screener

**10**  
tanneries adopted SS Bar Screener

**1**  
tannery implemented tallow extraction

**1**  
tannery implemented bio-digested system

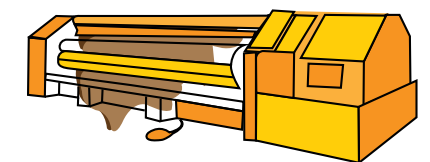
**3**  
tanneries showcase utilization of sludge to paver blocks

**1**  
tannery adopted buffing dust process

**61**  
workshops conducted on OHS

**7**  
eye screening camps conducted

**72**  
training of trainers conducted



## IMPACT THROUGH WATER FOOTPRINT REDUCTION

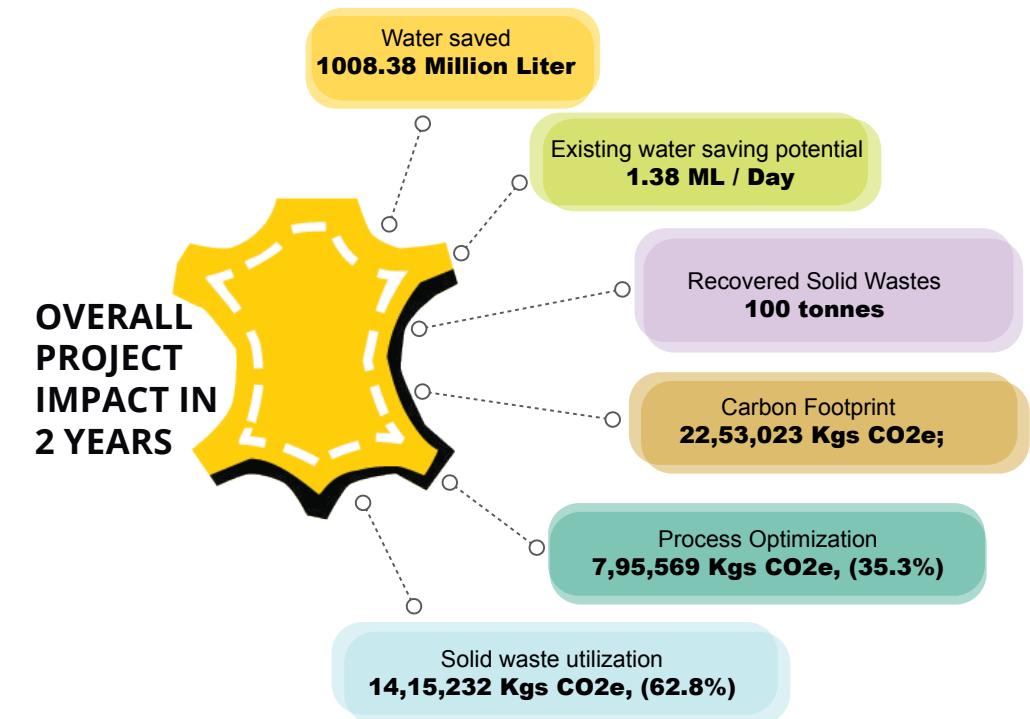
INTERVENTION	Water Footprint Reduction / Tannery (ML) / Year	Total tannery reached	Total Water Footprint reduction (ML) in 2 Years (Apprx.)
Water Optimizing Mechanism	1.23	100	247.10
Desalting Machine	3.45	45	310.5
Accurate Weighing m/c	6.91	20	276.4
Digital Water Flow Meter	0.0495	30	2.97
Enzyme Assisted Dehairing	1.728	27	93.31
Low Salt Tanning	0.9	10	9.0

## IMPACT THROUGH GHG REDUCTION

INTERVENTION	Carbon Footprint Reduction / Tannery (Kg CO2e) / Year	Total tannery reached	Total Carbon Footprint reduction (Kg CO2e) in 2 Years
Water Optimizing Mechanism	301.088	100	60217
Desalting Machine	4472.330	45	402509
Accurate Weighing m/c	2737.164	25	136858
Digital Water Flow Meter	168	30	10080
Enzyme Assisted Dehairing	2786.5	27	150471
Low Salt Tanning	1771.7	10	35434

## IMPACT THROUGH GHG REDUCTION OF SOLID WASTE

INTERVENTION	Amount Recovered (tonne) till April'23	Emission Factor (CO2Kg/t)	GHG saved (Kg CO2e) till April'23
CETP / Tannery Sludge (35% dry matter)	80	455	36400
Fleshings	4	624	2496
Trimnings & Cuttings	15	221	3315
Buffing Dust	0.05	221	11.05
Recovered "Cured Salt"	2268	624	1415232



# THE CHANGE MAKER

## STEPPING ON A SUSTAINABLE JOURNEY

Trident Tannery has undergone a remarkable transformation from an unorganized tannery to a modern facility equipped with state-of-the-art technological interventions. These advancements have not only elevated the efficiency and productivity of the tannery but also significantly reduced its environmental impact. One of the key technological interventions implemented at Trident Tannery is the installation of a desalting machine. This machine plays a crucial role in the treatment of raw materials by removing excess salt from the hides or skins which reflects in the significant drop of TDS (Total Dissolved Solids). Desalting is essential to ensure better-quality leather

production and prevents excessive water consumption during the process. Water optimization mechanisms have been put in place to maximize the efficient use of water resources. Water is a critical component in the tanning process, and the implementation of these mechanisms helps to minimize water wastage and lowers the overall water footprint of the tannery. Furthermore, the adoption of enzyme-assisted dehairing is another significant development. This enzymatic process aids in the removal of hair from hides or skins, reducing the reliance on traditional, often chemical-intensive dehairing methods. As a result, this eco-friendly approach not only improves the quality of leather produced but also reduces the environmental impact of the tanning process by reducing TSS (Total Suspended Solids), BOD (Biochemical Oxygen Demands), COD (Chemical Oxygen Demand) and sulphide content in the effluent.

To ensure a responsible and sustainable use of water, Trident Tannery has introduced a smart water automated saving system. This system monitors and optimizes water usage throughout the tanning process, ensuring that water is used efficiently and only when required. In addition to water conservation efforts, the tannery has also implemented an accurate weighing system. This system helps in precisely measuring and controlling the amounts of chemicals and materials used in the tanning process. By reducing excessive use of resources, such as chemicals, water, and energy, Trident Tannery minimizes its carbon footprint and contributes to a greener, more sustainable leather manufacturing industry. Moreover, Trident Tannery has taken a proactive approach towards waste management by utilizing solid wastes that come out of the leather manufacturing process. By finding innovative ways to repurpose and recycle these by-products, the tannery minimizes waste sent to landfills and reduces its environmental impact. To ensure compliance with environmental regulations and to continually improve its ecological performance, the tannery actively monitors effluent parameters. This helps to keep track of any potential pollutants in the wastewater and ensures that the discharge meets the required standards before entering the environment.

Perhaps one of the most significant strides taken by Trident Tannery is the adoption of green tanning processes. By integrating eco-friendly and sustainable practices into their operations, the tannery demonstrates its commitment to responsible manufacturing and environmental stewardship.

In summary, the transformation of Trident Tannery from an unorganized facility to a technologically advanced and eco-friendly tannery showcases its dedication to sustainability and environmental consciousness. Through the implementation of desalting machines, water optimization mechanisms, enzyme-assisted dehairing, smart water automated saving systems, and accurate weighing systems, the tannery has minimized its water and carbon footprint. By utilizing solid wastes, monitoring effluent parameters, and adopting green tanning processes, Trident Tannery sets an example for the leather manufacturing industry by balancing business growth with environmental responsibility with Solidaridad.

## TESTIMONIALS



Solidaridad has shown promising commitment towards Kolkata leather cluster. They have demonstrated water optimizing mechanisms like Solenoid valve, water meter etc. in our tannery and results are very encouraging.

**Prabhas Sadhukhan,**  
Technical Head, Ah Tiam Tannery



Solidaridad has successfully utilized PTP sludge into a very useful product, paver block, which was laid Infront of tannery raw entrance as well as in the parking area. I appreciate Solidaridad's green effort.

**Kamal Ahmad Khan**  
Managing Director, Dugros Leather (India) Pvt. Ltd



I really appreciate the work, Solidaridad has done in my tannery and the outcome was truly inspiring. We have tested the lime float for better understanding and reduction of TDS, TSS and Sulphide was prominent. I am happy with the quality of leather that coming through the Enzyme Assisted Dehairing.

**Azhar Nadeem**  
Managing Director, M. K. Products



Solidaridad has implemented few water saving interventions like solenoid, weighing system and desalting machine in my tannery. Their efforts and supports to escalate these commercially viable technical interventions helped me to showcase my tannery in global level.

**Asad Ahmad**  
Chief Executive Officer, N. J. Export



I am very close to Solidaridad people because they have always shown professionalism and informed me about every new technology. Recently, they have demonstrated solid waste utilisation technology where buffing was used to upgrade low selection leather. Thank you so much Solidaridad for introducing us with the globally recognized green technology.

**Taher Alam**  
Managing Director, Trident Leather



We appreciate their work specifically the desalting machine, paver blocks and solenoid valve mechanism should be adopted by everyone in the complex of Bantala.

**Imran Ahmad Khan**  
General Secretary, Calcutta Leather Complex Tanner's Association



Most of their interventions are cost effective and demonstrated in my tannery on previous year. Throughout the year they have supported for understanding the benefits of it. I would like to recommend everyone to try one of their interventions and experience the future of leather industry.

**Haider Ali**  
Owner, Crescent Tannery



The project - Effective Waste Management & Sustainable Development of the MSMSE tanning companies in Kolkata Leather Cluster (Bantala)- is an outcome of the Memorandum of Understanding between Solidaridad with Government entities of West Bengal and CLC Tanners Association. We as partner are working together in leather supply chain on different aspects of circular economy, waste to wealth, demonstration of techno-commercially viable process and implementation of cleaner technologies which itself proves that we are walking towards the path of sustainability.

**Ramesh Kumar Juneja**  
Regional Chairman-East, Council for Leather Export


# RECOGNITIONS



# DONORS AND PARTNERS



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ CERTIFICADO ◆ CERTIFICAT



## VERIFICATION STATEMENT OF GREENHOUSE GAS

The Certification Body of  
**TÜV SÜD South Asia Pvt. Ltd.**  
certifies that the GHG Assertion reported by  
**Solidaridad Regional Expertise Centre**

### Solidaridad


For its  
**Project Interventions in**  
Trident Leather, Bantala Leather Complex, Zone 03, Plot 219 to 221, Karaidanga, Kolkata, India.  
N J Exports, Bantala Leather Complex, Zone 01, Plot 54, Karaidanga, Kolkata, India.  
Aslam Tanning Industries, Bantala Leather Complex, Zone 03, Plot 217-218, Karaidanga, Kolkata, India.  
Dugros Leather India Pvt. Ltd., Bantala Leather Complex, Zone 08, Plot 622, Karaidanga, Kolkata, India.

In line with  
**ISO 14064-2:2019**


Base Year: 2021    Application Year: 2022  
Reporting Period: January 2022-December 2022

Total GHG emissions reduction reported for Desalting Mechanism: 5.76 tCO<sub>2</sub>e/year;  
Total GHG emissions reduction reported for Water Optimization Mechanism: 0.3 tCO<sub>2</sub>e/year;  
Total GHG emissions reduction reported for Accurate Weighing Mechanism: 143 tCO<sub>2</sub>e/year;  
Assurance Category: Limited Level  
GHG Accounting Standard: ISO 14064-2:2019  
GHG Sources:  CO<sub>2</sub>  CH<sub>4</sub>  N<sub>2</sub>O  HFCs  PFCs  SF<sub>6</sub>

Verification Statement No.: VVB-06/  
Vide Report No.: ET-006263



Shrutika Kudarkar,  
Manager, Certification Body  
TUV SUD South Asia Pvt Ltd  
Date: 30/05/2023



FILE: IS-GHG-VVB-06    Version:04    Effective: 15-01-2022    1

Statement continued

Project title	Project Interventions in Kolkata Leather Cluster (Bantala)
Name of the Client	Solidaridad Regional Expertise Centre
Location	Kolkata, India
Technology/ Sector	Leather and Leather Products (EA Code: 05)
GHG Sources	Purchased Electricity from Indian National Grid
Type of GHGs	CO <sub>2</sub>
Base year	2021
Inventory year	2022
Reporting Period	January 2022 to December 2022
Criteria	In line with ISO 14064-2:2019

Objective: The objectives of this audit were to:

- To determine the extent of conformity of Solidaridad Regional Expertise Centre GHG emissions reduction interventions implemented in four tanneries of Kolkata Leather Cluster (Bantala) with the applicable verification criteria's of ISO 14064-3:2019, including the principles and requirements of applicable clauses of ISO 14064-2:2019;
- Evaluate the project GHG information system and its controls/management in preparing emission report;
- Confirm whether or not the GHG assertion is without material and whether the verification activities provide the level of assurance agreed to at the beginning of the verification process.

Level of Assurance Achieved: Limited


Conclusion on the GHG assertion, including any qualifications or limitations (hypothetical, projected and/or historical in nature): The statement and report can only be used for the intended use defined in verification report. The GHG emission reductions are verified at the implementation sites namely Trident Leather, Dugros Leather (India) Private Ltd., Aslam Tanning Industries Pvt. Ltd. and N. J. Exports premises. The validation of the methodology proposed by the project proponent in the verification report is based on the data reported at the above-mentioned sites.

Whether there is

evidence that the GHG assertion is materially correct and fair representation of the GHG data and information or that it has been prepared in accordance with the related international standard on GHG quantification, monitoring and reporting or to relevant national standards or practices.

no evidence that the GHG assertion is materially correct and fair representation of the GHG data and information or that it has not been prepared in accordance with the related international standard on GHG quantification, monitoring and reporting or to relevant national standards or practices.

FILE: IS-GHG-VVB-06    Version:04    Effective: 15-01-2022    2







**SOY**





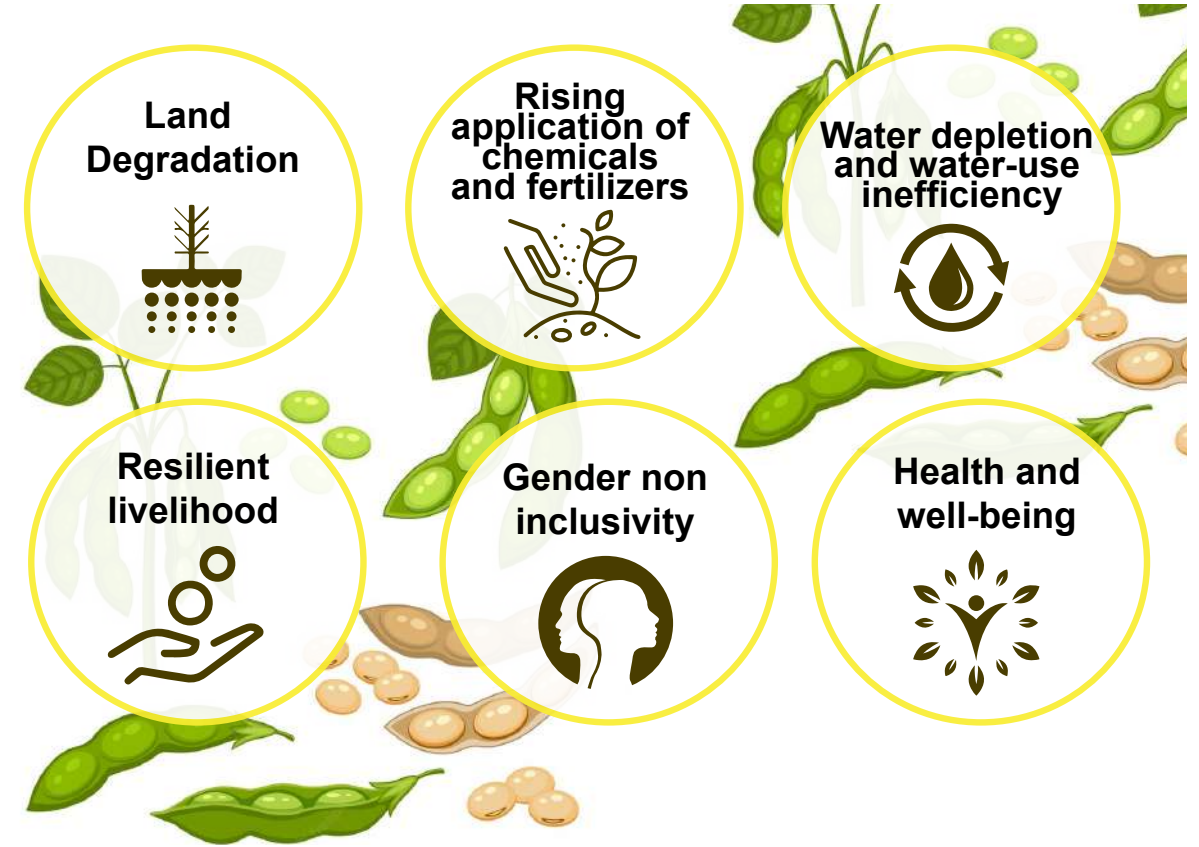


## A TALE OF MISERY

Indian states of Madhya Pradesh and Rajasthan play a key role in the agricultural growth of the country. Madhya Pradesh contributes around 8% of the total food grain and around 25% of total pulses and oil seeds production in India. There are 11 different agro climatic zones in the state which has aided in the diversification of crops. The state ranks first in the production of oil seeds, pulses, soybean and chick pea.

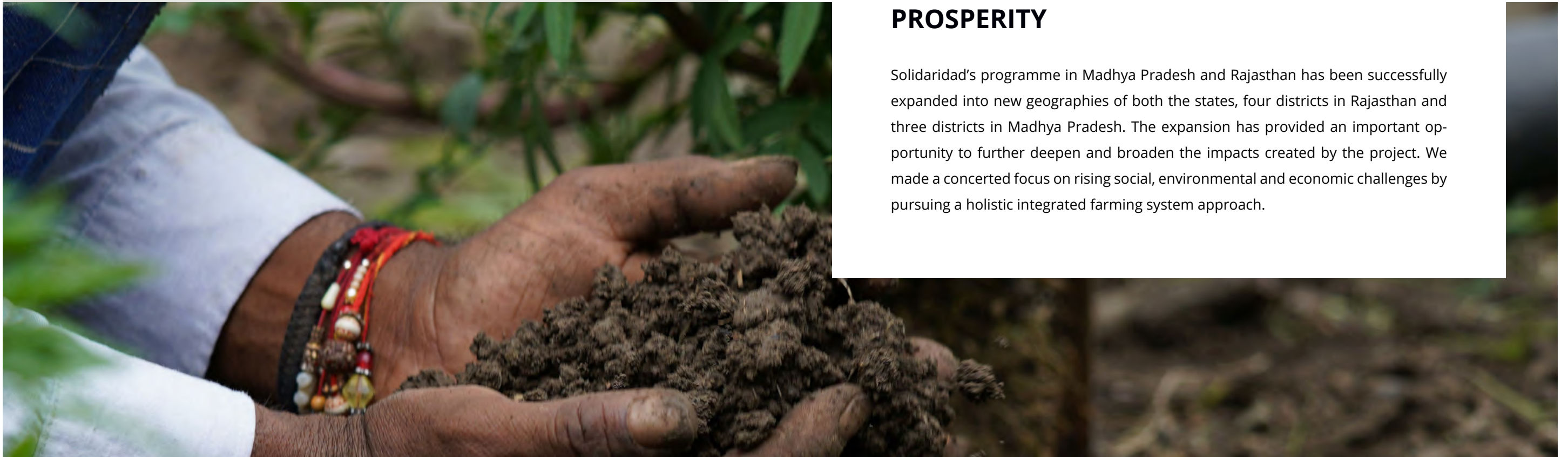
In Rajasthan, a large population is engaged in agriculture and its allied sectors. Agriculture production in the state is largely depends on timely arrival of monsoon. The state produces 5.49% of the nation's total food grains and 21.31% of its oilseeds. Rajasthan is the largest producer of mustard and Bajra and second largest producer of groundnut in the country. It contributes 42.41% and 46.46% of total production of Bajra and mustard respectively at all India level.

However, farmers are grappling with various challenges: lack of access to resources, climate shock, deteriorating soil and water resources, poor agricultural output and uncertain income and livelihood. Lack of women's access to knowledge and nutritional risks is a major social challenge prevalent in the state of Madhya Pradesh.



## INTEGRATED FARMING SYSTEM TOWARDS PROSPERITY

Solidaridad's programme in Madhya Pradesh and Rajasthan has been successfully expanded into new geographies of both the states, four districts in Rajasthan and three districts in Madhya Pradesh. The expansion has provided an important opportunity to further deepen and broaden the impacts created by the project. We made a concerted focus on rising social, environmental and economic challenges by pursuing a holistic integrated farming system approach.



## Farmers Training and Capacity Building in Good Agricultural Practices

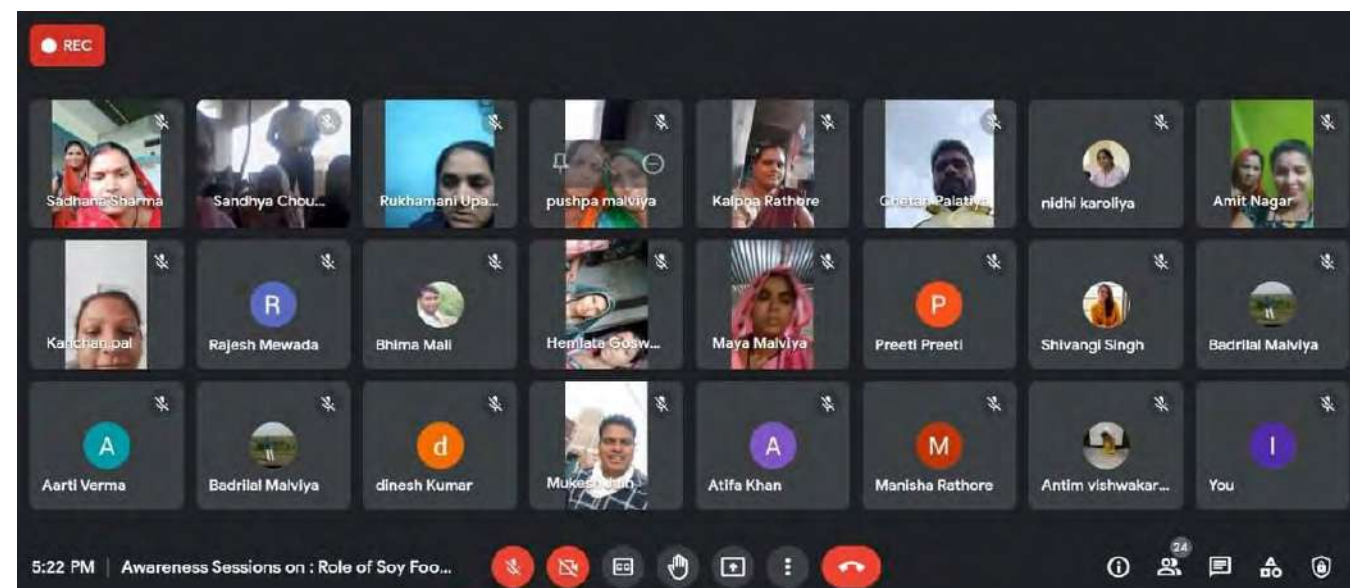
In the year 2021-22, Solidaridad organised a systematic capacity building programme on Good Agriculture practices (GAP) which included adoption of recommended package of practices by the target farmers. Farmers organised under farmer field school were provided with knowledge and practical exposure on GAPs namely, land preparation by deep summer ploughing, seed selection and seed treatment, integrated nutrient management, integrated pest management practices, intercropping and weed management, irrigation management harvesting and post harvesting management of soybean in kharif and wheat and gram in rabi season.

The Krishi Vigyan Kendras (KVKs, district based agricultural extension centres) are engaged for their technical knowledge support to the local extension team. The Training-of-Trainers (ToTs) and extension activities were organized with the technical knowledge support of KVKs and Indian Institute of Soybean Research. Through such ToTs the extension staff are informed and trained on the roll-out of improved training curricula for soy and vegetables. These ToTs aimed towards facilitating the effective implementation of farmers engagement and extension model and to update them with new and improved technologies and practices.

Farmers were given practical demonstration and exposures on each of these GAPs which included selection of quality seed which has biotic and abiotic resistance. Farmers were given knowledge about variety cafeteria and go for combination of variety to ensure efficient input use, cope with climatic abnormalities.

## Frontline Demonstrations on Improved Practices

The demonstration plots are set-up for farmer learning and experimentation, thereby providing an opportunity for them to observe the benefits of improved seed varieties, good agronomic practices and climate smart agricultural practices. A total of 225 Front Line Demonstrations (FLDs) were successfully organised. The FLDs were appropriately planned by way of selection of farmers and demonstration sites as per prescribed guidelines and followed by organizing an orientation training by the subject matter specialists (SMS). The executed FLD programme was aimed to showcase the comparative advantages of the key critical agronomic interventions like seed-bed preparation, incorporation of enriched compost /FYM, selection of improved varieties, seed treatment, germination/emergence test prior seeding, optimized seed rate, adoption of integrated approach for nutrient, pests, disease, weeds and water management, and intercropping operations, and last but



not the least precautionary harvesting and post-harvesting practices to which farmers remain either unaware or not keen to adopt in the absence of knowledge on benefits of adoption.

## Distribution of Quality Inputs for Demonstration

The quality inputs are distributed among lead farmers with the objectives to demonstrate its result among farmers. The quality inputs include improved seed varieties, seed treatment materials, IPM kit, fertilisers, liquid manures and NPK etc.

## FARMERS FIELD SCHOOLS (FFS)

The Farmers Field Schools (FFS) and lead farmers led extension approach is followed for farmers engagement and extension. This approach facilitates participatory process of learning by doing. The objective of setting-up of FFS is for transfer of technical knowledge and improving capacities, decision making of farmers for adoption of available technologies and stimulating local innovations. FFS would also sensitize farmers in new ways of thinking and problem solving based on their own observations of experimental plots in their Field schools and to explain their reasoning. The FFS facilitates learning sessions at demonstration plots and "Lead Farmers" are identified who are prepared as local expert to facilitate adoption of practices by fellow farmer in the locality.



In view of limitations of pandemic Covid-19, webinars involving all the lead farmers were organised with the support of Sr Scientist and Agronomist and Plant Protection Specialist. A special round of training was also imparted to respondents in each district in July and mid-August by subject matter specialists/scientists. The Weekly Advisory issued by ICAR-IISR on Soybean PoP was made available to all the farmers through social media group and also during group interactions. Full support of KVKs in the districts was mustered for training and in on-spot addressing the issues emerged during the cropping season. Short videos on specific subjects like Land Preparation, Varietal Selection, Seed Treatment, Intercultural Operation cum Weed Management, Moisture Management, Integrated Nutrient Management, Sowing on BFF System, Integrated Pest Management, Harvesting and Post-harvesting Management, Yield Assessment were prepared with support of scientists working with Solidaridad and were provided to all the farmers to get the complete understanding of the technical interventions. A weekly tracking system was developed to check and understand the crop condition which helped to issue regular field advisories to farmers as per the crop situation and prevailing climatic conditions.

Many group meetings were organized for mobilization of farmers as well as to make them aware about the new knowledge and technologies. Such meetings would also provide opportunities for extension staff and farmers to come together to discuss and analyze issues and ideas. Such meetings are organized at different intervals of crop i.e. pre-sowing, post-sowing, harvesting, post-harvest and marketing.

### **Promotion of Crop Diversification for Enhanced Income of Farmers**

We have successfully promoted the crop diversification with-in the soy cropping system. The objectives of promotion of crop diversification were to promote the resource use efficiency, climate resilience, entrepreneurship development as well as nutrition and food security. For crop diversification, we have promoted the key crops i.e. medicinal and aromatic plants (MAPs) as well as mustard and vegetables. Integration of these crops in the soy cropping system, makes a unique combination.

Through the interventions around soy and mustard we are also contributing towards Government of India's ambition towards the self-sufficiency in the edible oils. We are closely working with the relevant government agencies through the solvent extractors' association of India and sharing the best practices and experiences for the country wide replication. We are expecting to develop a mega programme around edible oils together with the support of Government of India and potential private partners.

Medicinal plant cultivation among the small holder farmers have helped in crop diversification and created a buffer for small holder famers to climate change risks and a measure for climate change adaptation, as well as food, health and livelihood security.

In addition to these, Solidaridad together with the 1-2 Taste has introduced a digital marketplace for small-holders to sell their products to potential buyers in India as well as in Europe. Under the pilot, Solidaridad is supporting FPOs and entrepreneurs who are the small and medium enterprises (SME) and prepare them to aggregate and source sustainably cultivated plants and support them where needed to onboard to the 1-2-taste platform. Through such platform our aim is to develop new markets and create shorter and transparent supply chains that allow for more equal value sharing and more rewarding prices for farmers and SME suppliers.

### **Support to Farmer Producer Organisations (FPOs) and Rural Entrepreneurs**

The Farmer Producer Organisations (FPOs) and rural entrepreneurs are promoted to facilitate business models around advisory, inputs, farm machinery, post-harvest and market linkages services to farmers. The FPOs and agri enterprises are one of the key pillars of our intervention strategy around local ownership and handing over the responsibilities.

During the year, we have provided training and capacity building support to 11 farmers' organizations (FPO), 64 rural entrepreneurs and 20 extension service providers (these service providers are associated with FPO). The trained rural entrepreneurs (64) provide advisory support and timely availability of quality inputs that includes crop protection products, quality seeds and fertilizers. The FPO produce, process and market the quality seeds, with the objectives to ensure availability of quality seeds at fair prices to farmers. In addition, the FPO provides the aggregation and market linkages support to the member farmers.

### **Contribution of Towards Government of India's Ambition of 10000 FPOs**

The Government of India has approved and launched a Central Sector Scheme of "Formation and Promotion of 10,000 Farmer Producer Organizations (FPOs)" till 2027-28. The scheme was launched by the Prime Minister Narendra Modi, in the year 2020. As part of this ambitious task, we have signed an MoU with the Small Farmers' Agribusiness Consortium (SFAC) as CBBO for formation of 10 FPOs in Madhya Pradesh and Rajasthan states of India.

## **GOVERNANCE AND MANAGEMENT OF FPOS**

The governing board is one of the critical components in FPO. It is identified that the board members of FPOs are mostly lacking leadership skills and capacities which affects the decision-making process in FPO and institutional efficiency therefore the Board of Directors of FPOs are targeted to be trained to ensure efficient governance system, better decision making and transparent practices. Series of field training and capacity building programmes are organized for promotion of leadership and motivation among the elected Board of Directors of FPOs. FPO wise vision building exercises are also organized.

## **HAND HOLDING AND BUSINESS PLAN TRAINING FOR FPOS AT IRMA**

It is identified that the FPOs are lacking the skills to prepare business plans hence we have engaged the Institute of Rural Management, Anand. The institute is an autonomous institution and premier business school located in Anand Gujarat, India with the mandate of contributing to the professional management of rural organisations. The business plan process followed a comprehensive process which includes identification of potential commodities and service provision related business opportunities facilitated by the FPO. The business planning process also included the financial planning and plan to raise the finance etc. In addition to this, the office bearers/staff in FPO as well as board member are capacitated on business planning process, understanding of rules and regulations, statutory requirements to the RoC, Government schemes and basic accounting and record keeping etc.

The training programme was organized at the Institute of Rural Management (IRMA) Anand, Gujarat. for the FPOs promoted under the project.

## SET-UP OF SOY FOOD PROCESSING MACHINE BY RAKSHIKA WOMEN FPO

The Rakshika women FPO, which is jointly formed by Solidaridad and MPSRLM, has set-up a soy food processing unit for production of soy milk and soy tofu. The unit was inaugurated by Mr Michiel Van Erkel, Agricultural Counsellor, Embassy of the Kingdom of the Netherlands in India. The produced soy products would be sold in the local markets as well as in the MDM school kitchens. The similar two more units are also set-up by women SHGs in Ujjain and Agar districts.

### Setting-up of Custom Hiring Centres by FPO

Through the project, the FPOs are supported for setting-up of custom hiring centres on a pilot basis. Four BBF planter and three Multi crop Grading machines have been provided in the project districts which would be used on custom hiring basis under the motivated Rural entrepreneurs. It will help and motivate more number of farmers to go for BBF(Broad Bed and Furrow) planting and also obtain quality grain through use of multi grain grader machine which would help farmers do primary processing and segregate the quality grain before taking to market and fetch premium price. Similarly, the entrepreneurs would receive a chance to explore new opportunities in agriculture and its scientific enquiries. In addition to this, a total of 38 soil testing kits and 15-grain moisture meters are also provided to the rural entrepreneurs.

A virtual training session on “Training of Trainer (TOT) of Rural Entrepreneurs on Soil Testing” was conducted for more than 40 Entrepreneur and 12 field team members from five project districts. The training helped rural entrepreneurs to understand importance of soil testing, process of soil sampling, testing N,P, K and Ph and report interpretation etc.

### Quality Seed Production by FPOs

In order to ensure the availability of quality soy seeds, the Samarth Kisan Producer Company Ltd Agar is supported through set-up of a new gravity separator machine. The machine will remove the damaged, deteriorated, insect damaged crop seed and stones from good seeds. With the help of this machine, the lightest seeds float down under gravity and are discharged at the lower end, while the heaviest ones are kicked up the slope by contact with the oscillating deck and are discharged at the upper end. This machine separates seeds of the same density but of different size and seeds of the same size but of different densities. Therefore, it provides greater separation efficiency and accuracy which is very much required for quality seed processing.

Similarly, in Dewas District the Diwasa Agro Producer Company has procured the 20 quintals of quality onion seeds from Maharashtra @ Rs 850 per kg and sold off the seed @Rs 1050 per kg. The member of FPO have received the quality seeds at a fair price. Overall, through these interventions FPOs are oriented about the aggregation and sale of inputs as well as market linkages. Further these FPOs would facilitate for service provision around quality inputs and aggregation and market linkages for quality soy produced by its member farmers.

FPO resource centres cum information centre are also being set up in 7 different locations with facility for farmers meeting and trainings.

## SUSTAINABLE EDIBLE OIL MISSION: TOWARDS SELF-SUFFICIENCY IN EDIBLE OILS IN INDIA

Solidaridad together with the Solvent Extractors' Association of India (SEA) promoting the sustainability in the edible oil sector through a joint mission. The mission is very well aligned with the Government of India's ambition towards making India 'Atmanirbhar' in edible oils.

Under this mission, we have achieved many milestones in last few years. The Indian Palm Oil Sustainability (IPOS) framework is developed with the support of Indian Institute of Oil Palm Research (IIOPR), SOPOPRAD and many industry stakeholders. IPOS strengthen the social, economic and environmental aspects of palm oil production and trade. It will help in acceleration of expansion of Oil Palm production and expansion in India under the NMEO-OP. Already together with the Godrej Agrovet Ltd. we are preparing farmers for the sustainable production of Oil Palm, we are also in-process to promote oil palm in a big way in the North Eastern states of India. Solidaridad and SEA are already facilitating coordination and cooperation with the major palm oil producing countries i.e. Indonesia and Malaysia for the sustainable production and trade.

The Mission Mustard Model Farms Project was launched in the year 2019 and expanded it into the key producing and potential states i.e. Rajasthan, Madhya Pradesh, Uttar Pradesh and Punjab with an ambitious target of increasing the production of rapeseed-mustard by 200 lakh tons by 2025. The Directorate of Rapeseed-Mustard Research is engaged for providing technical knowledge support through regular guidance and advisory on technical aspects.

In the year 2021-22, a total of 500 Mustard Model Farms were set-up in Tonk, Bundi, Baran and Kota Districts of Rajasthan and Mandsaur Dist of Madhya Pradesh.

In 2021-22, the model farm farmers have realized the yield of 28.6 quintals per hectare and control farmers have realized 18.68 quintal per hectares, which is 53% higher than the control farmers, as per the MART study. The farmers are supported through extension and trainings on scientifically proven technologies, access to improved variety seeds and crop management practices for better yield and income. Such encouraging and positive outcomes from the mustard model farms project provide potential opportunity for county-wide expansion of this initiative towards achieving the ambitious target of increasing production and productivity of oilseeds.

## STRATEGIC INTERVENTION WITH 20:20 MODEL

A new concept around the 20:20 Model of Eco Agriculture, was introduced last year to demonstrate the new and innovative solutions for addressing the challenges of the conventional agriculture i. e. heavy use of chemicals, land degradation etc. Developed by Padma Shri Awardee Dr M H Mehta, the former vice-chancellor of Gujarat Agriculture University (renowned agronomist and Chairman of Gujarat Life Science, Vadodara) developed 20:20 model of Eco Agriculture, this model is a combination of eco-friendly technologies, resource efficient and circular agriculture practices and gives practical insight to have 20 % more crop production with more than 20 % reduction in input cost in a sustainable and evolutionary manner. The model leverage and apply the technological advancement in areas of bio-fertilizer, bio-pesticide, bio-compost and agro waste management in crop production. It is a proven concept which have already been implemented in different countries including India, Africa and far Eastern countries.

Solidaridad is promoting sustainable and integrated farming system approach with the key objectives to improve productivity, reduce cost of production, improve soil health, water use efficiency and mitigate climate risk and hence 20-20 model perfectly fits in to our strategy. Under our Soy Programme, we have made efforts to adapt some of the key practices and principles given under 20:20 model. The Practices followed through series of extension activities and Front-Line Demonstration. The basic premise behind our approach for sustainability is:

- Integrated Farming System approach for sustainability
- Improving Soil health and water Use Efficiency
- Adopt Agro ecological approach for pest & disease management
- Input use efficiency i.e. produce more with less
- Promotion of climate resilient production practices

### Outcome and impact of adopting 20:20 Model:

Adoption of some of the above key practices of 20:20 model has brought about some of the key impact in terms of soil health, crop yield and agro ecology. The low cost formulation was affordable for farmers who were eager for such products to minimize the burden of input cost. Some of the key outcomes are as below:

- Improved Soil moisture and soil organic carbon content
- Almost 20 % reduction in use of fertilizer
- 20 to 30 % decrease in use of pesticide, insecticide due to protective IPM methods.
- Improved soil fertility owing to use of waste decomposer, desi manure and enriched compost
- Decreased exposure of farm worker and farmers to agro chemicals.
- Cost of production reduced by 25-30 % on an average
- Productivity improved by 20-25 % on an average.

## SMART AGRI: LEVERAGING TECH ENABLED SOLUTIONS FOR FARMERS

Solidaridad with support from Vodafone Idea and Indus Tower's CSR initiative implementing the Smart Agri project, which aims to bring about the change by leveraging technology in agriculture to move it from subsistence to enterprise. The project was introduced in January, 2020; with-in the dominant production system of soy and cotton in the state of Madhya Pradesh and Maharashtra with 50,000 farmers.

The project has made significant contribution towards preparing farmers for the use of digital IoT based solutions. The precise information and scientifically proven advisories shared to farmers help them for optimum use of resources i.e. water, fertilizers and pesticides and in turn increase the productivity and contribute towards the ecosystem restoration.

The main feature of this program is the advisory support to farmers for subsequent crops so that they can maximize their output from the adopted practices, the project has built the capacity of farmers on the use of IT solutions in adapting good practices and efficient technologies on ground. The SmartAgri project has empowered over 75821 farmers in the states of Madhya Pradesh and Rajasthan to use sustainable farming practices. The project is making a great impact in helping farmers reduce climate induced risk through Weather based real time advisory services and expert guidance on adoption of climate resilient practices.

### HARNESSING WOMEN POWER

#### Cadre of Trained Nutrition Team

During the period, we have set-up a vibrant and trained team of nutrition experts including field extension functionaries who are facilitating the implementation of extension activities, training and capacity building as well as awareness programmes related to nutrition and health for the targeted community. A total of 64 Nutri Sakhis are identified and trained during this year.



Team: Series of training programmes are organized for improving the technical knowledge on nutrition, causes of malnutrition, training on diversified diets and food preparation methods etc.

### Orientation and Training of Nutrition Team








**Communication and Facilitation Skills:** The nutrition team is trained on the soft skills such as facilitation, negotiation, communication and gender sensitivity. Through such trainings the nutrition team is expected to motivate and encourage households for the consumption of nutritious soy food and vegetables.

**Community Mobilization, Trust Building and Cultural Awareness:** The extension team visited to different villages with the objectives to maintain regular contact and have established relationship with the people and the community in which they will work. As the extension agents are mostly from the local area where they are working, therefore they have intimate knowledge and understating of the local context, social norms, belief systems and culture etc.

### Training and Capacity Building

The training and capacity building activities are organized using different training modules developed by the Nutrition experts. These modules are mainly focused on causes and identification of malnutrition, balanced diet, Anemia, dietary diversity and importance of nutritious vegetables. The objective of these training programmes is to build the capacities of key extension functionaries i.e. Nutri sakhi and paraworkers who are directly working in the field. The details of training modules is given in the table below.

### Community Mobilisation and Awareness Creation of Soy Food Consumption

 <b>Awareness on Malnutrition and Anemia</b>	 <b>Demonstration and Trainings on Kitchen Gardens</b>	 <b>Cookery Classes and Demonstrations</b>	 <b>National Forum for Soy Food Promotion</b>
 <b>Capacity Building of Beneficiaries on benefits of Soy and Vegetable's Nutrition</b>	 <b>Interventions around Behavioural Change Communication (BCC)</b>	 <b>Training of Beneficiaries on Soy food processing</b>	



### Digital Inclusion of Women

Solidaridad is training women on the use of digital tools and solutions. Through the improved knowledge of women, we are aiming to mainstream the involvement of women in decision making process.

### Women Entrepreneurship and Skill

We are promoting women entrepreneurs in the project villages. These women entrepreneurs are prepared on food processing, preparation of bio-pesticides/bio-fertilizers, cultivation and primary processing of high value crops like medicinal plants and vegetables etc.







### Weekly Nutrition Choupal

**GOOD FARMING – GOOD FOOD**

**Weekly Nutrition Choupal**  
( Every Saturday 4:00 to 5:30 PM )

**Importance of Nutrition Garden in backyard and its Benefits**  
पोषण वाटिका का महत्व और उसके लाभ

<p><b>DATE</b> 04 December 2021</p> <p><b>EXPERT</b> Dr. RPS Shaktawat Head and Sr. Scientist Krishi Vigyan Kendra , Agar Malwa</p> <p><b>Agenda</b></p> <ul style="list-style-type: none"> <li>- Meaning of Backyard Nutrition Garden and Importance for the Family</li> <li>- Nursery Layout and Design for Nutrition Garden</li> <li>- Selection of Vegetables for Nutrition garden</li> <li>- Importance of Seasonal Vegetables and Method of Growing</li> </ul>	   
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**How to Join ?**  
Click on the link below after installing Google Meet  
<https://meet.google.com/xfs-tpwr-wsg>

**For More Information Please Contact**  
nidhi.karoliya@solidaridadnetwork.org  
sandhya.choukiker@solidaridadnetwork.org  
Ms. Shikha Gaur - 6263442834  
Ms. Kanchan Pal - 6267118140

The weekly Choupal initiated in the Month of May 2021 with the objectives to provide a platform for rural women to directly consult with the experts on the health and nutrition related issues. The Choupal is being organised on every Saturday. In each of the choupal, the expert sessions are organized on different topics related to nutrition, balanced and diversified diets, importance of soy and nutritious vegetables etc. The Choupal has also provided opportunity for rural women to share their experiences as well as to get answers to the different questions and concerns related to health and nutrition. The experts from different institutions like Indian Institute of Hotel Management, College of Food Sciences etc are invited for taking the expert sessions. The project partners i.e. Vippy, Samarth, EWS, MPSRLM are actively engaged in the programme, including this the leading key stakeholders i.e. Mid-Day Meal and Department of Women and Child Development – ICDS were also engaged in the choupal.



## COVID-19 RESPONSE

With the objectives to complement the Government of India's efforts and to make the valuable contributions to benefit the society in the event of outbreak of Covid-19 pandemic, we put our efforts to support those families which are affected by the Covid-19.

### Ration Kit Distribution

A total of 300 vulnerable households have been identified in all the project districts which are affected by the Covid-19. These households were supported through free of cost distribution of ration kits.

### VI Scholarship Applications

A total of 69 students are awarded with the Vodafone Idea Foundation's Students Scholarship Programme 2021. The Scholarship initiative aims to bridge the social and fiscal divide that teachers and students face in terms of availability and accessibility to the necessary resources that help them to excel. In times of the pandemic, such scholarship programme is helping students get resources to invest in technology tools and their education. We believe this will go a long way in spreading the light of education and further enhance employability of people, thereby also reducing poverty. The selection process which was based on merit and it was entirely online process, overseen by an independent jury, including eminent educators, representatives of civil society organizations.



## ACHIEVEMENTS

**60,752**

farmers capacitated on good agricultural practices



**53%**

higher yield for mustard model farms compared to control farms



**11 FPOs and 64**

rural entrepreneurs trained on Agri supply chain



**78,977 ha**

area under good agricultural practices



**14.45%**

reduction in cost of cultivation



**64**

"Nutri-Sakhis" trained



**19.86 %**

increase in yield with new seed varieties



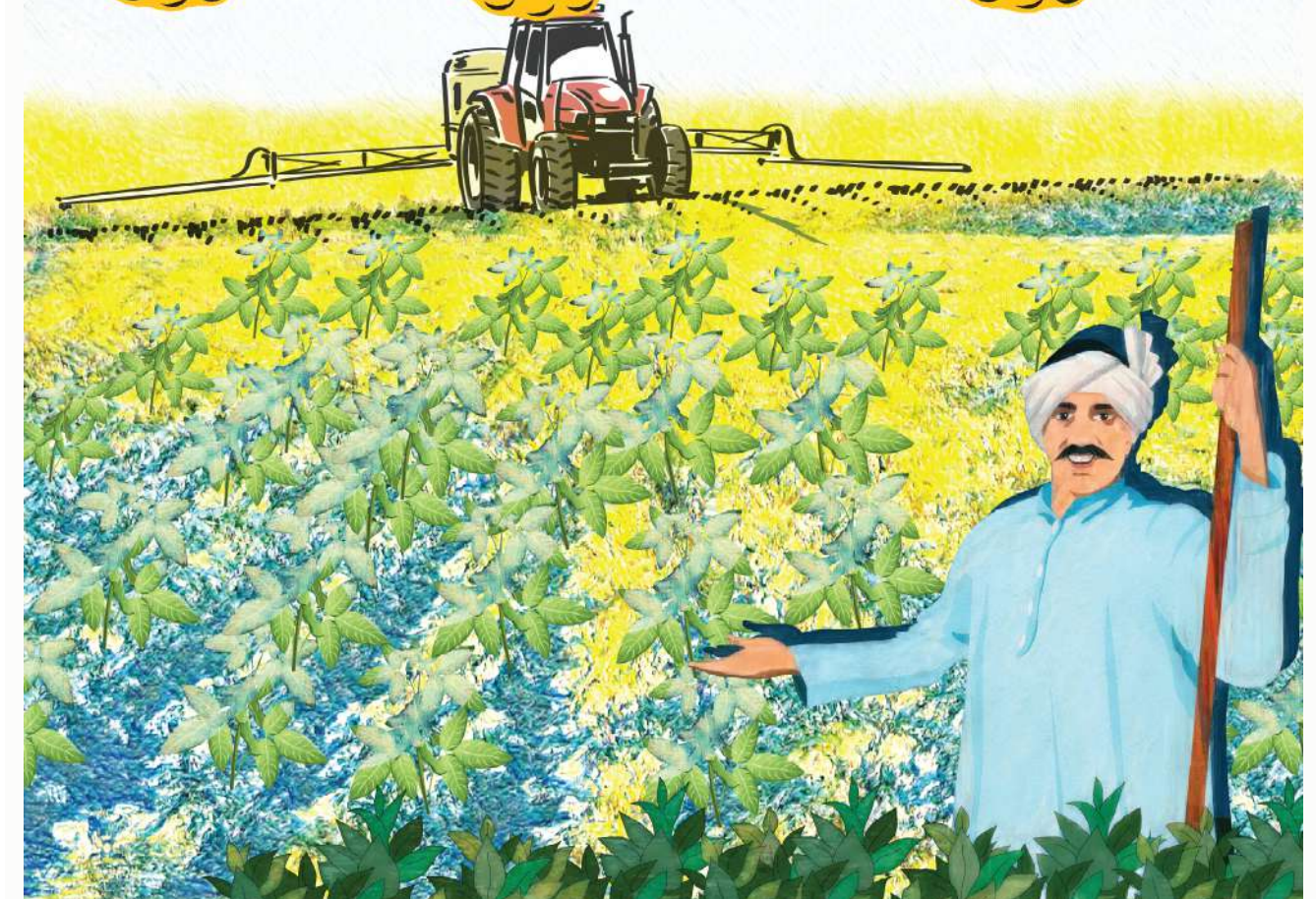
**20%**

reduction in cost of production and 20% increased production under the innovative 20:20 model



**8402**

women trained and empowered



## PARTNERS/DONORS



## THE CHANGE MAKER

## SHIFT FROM LOW VALUE CEREALS TO HIGH VALUE MEDICINAL PLANTS

Mr Dinesh Patidar, a farmer of Rola village, Sehore district, decided to take up cultivation of Ashwagandha plant on 1 acre of his farmland, in place of cultivation of traditional crops. Mr Dinesh came to know about the basics and benefits of medicinal plant cultivation from Solidaridad field trainings and meetings. Thus, as a start, he took up Ashwagandha cultivation on one acre of his land, which he previously used for growing traditional crops like; wheat and chick-pea.



For the last four years, Mr Dinesh has participated in the field trainings and meetings conducted by Solidaridad on sustainable agriculture practices and techniques. As an active farmer he has also adopted these good practices in his farm, all these years, and have obtained better results from it, which he shared with fellow farmers as well. When he learnt about the benefits of Ashwagandha cultivation, he brought the saplings by himself to plant in his farm. Usually, medicinal plant cultivation requires low chemical fertilizers, pesticides compared to traditional crops; thereby reducing the input cost. Further, good and sustainable cultivation practices in medicinal plants, improve the quality of the output and fetches good price for the cultivators. Solidaridad field team and experts provided the required support, in terms of knowledge on sustainable cultivation techniques and practices for Ashwagandha cultivation, to Mr Dinesh.

Till date, Mr Dinesh has harvested his Ashwagandha plants once and have also sold them to Neemuch district Agri-Produce Market. He earned about Rs 1 lakh net from his one acre of Ashwagandha cultivation, which is high compared to the profit earned from one acre of wheat crop. This motivated Mr Dinesh to take up medicinal plant cultivation in a considerable way. This year along with Ashwagandha (1 acre), he is also cultivating Askara (1 acre) and Kalonji (0.6 acres) plants in his farm. Seeing his profits and success, about 50 farmers from the village has taken up Ashwagandha cultivation this year. Solidaridad subject experts and field team is providing all hand holding and technical support to these farmers on sustainable cultivation techniques and practices of medicinal plants (Ashwagandha). Cultivation of medicinal plants is commercially beneficial for the cultivators and also addresses the growing demand for the plants in the country. Mr Dinesh is a lead farmer in this region for promoting medicinal plants cultivation among the fellow farmers. His hardwork, determination and success has inspired and is inspiring many farmers from the nearby villages to take up medicinal plant cultivation along with traditional crop cultivation.





# SUGARCANE





## BITTER TASTE OF SWEET CROP

India is a major producer as well as consumer of the sugar in the world and is generating about 30MT of sugar from 400MT of canes annually. The sugar industry in India has been a focal point for socio-economic development in the rural regions by mobilizing rural resources, generating employment, and enhancing farm income.

Maharashtra, Uttar Pradesh, Karnataka are among the top sugarcane and sugar producer states in India. Sugar(cane) industry plays a crucial role in the socio-economic development in the rural regions of these states. However, majority of sugarcane growers of these states have been facing different challenges in their farming practices and realising financial crunch due to ongoing increasing cost of cultivation. Most of the farmers of these states are still following the traditional method of sugarcane farming which involves excessive use of chemicals and water for irrigation. All these practices are ultimately promoting polluting land decreasing water table and degrading the fertility of land.

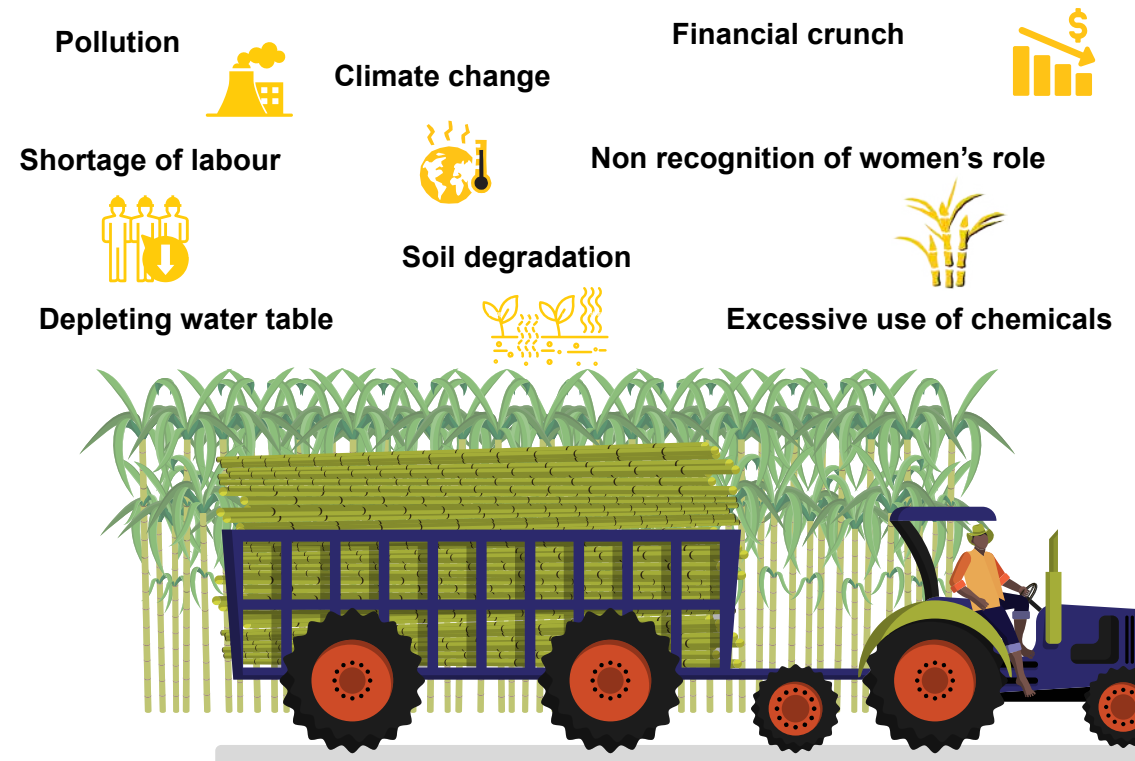


On the socio-economic front, these states are dominated by feudal system of society and contribution of women have been remained unidentified and unaccounted. Feudal system does not allow to transfer or procure immovable assets on the name of women. Further to that, as a long crop (in height) sugarcane is not considered a safe crop for women in almost all the states.

As the demand for sugarcane has been increasing in India, due to push given by Ethanol Policy, of the government. The Ethanol Policy of the Government of India (2018) talks about blending of Ethanol (up to 25%) in fossil fuel reduce the emission GHG including carbon dioxide. However, ongoing climate change is posing a big threat not only on the sugarcane cultivation but across all the agriculture commodities (crops) in India.

Apart from it the conventional practices, that have been adopted by larger segment of farmers, intensive use of fertiliser and water in sugarcane cultivation have been remaining a big issue in sugar sector. Due to shortage of labour burning of trash/ crop residue has also been increasing across India, causing a great loss to environment in surroundings and health of people living in and around those areas. In one of the base line surveys, in Kolhapur and Sangli districts of Maharashtra, it was realised that 80 % of the farmers are burning the crop residue after harvesting. In that survey it was also came out that only 1% of farmers are applying vermi-compost which shows that farmers are not caring about soil organic matter which is essential for the sustainability of soil health.

## CHALLENGES



## SWEET DEAL

Solidaridad designed some new strategies and interventions to ensure regenerative and sustainable supply of sugarcane as it gives employment to more than 50 million farmers and has been a major source of income to support the daily needs of their family members. To make a positive and deepen impact on the community members Solidaridad developed partnership with different sugar companies (Dalmia Bharat Sugar and Industries Limited, Shree Renuka Sugars Limited, NSL Sugars and DCM Shreeram Sugars) and designed programme to implement for the improvement of agriculture practices of famers/ sugarcane growers who are living in the vicinity of sugar mills of these corporates.

During the year Solidaridad started a new initiative in Maharashtra (Kolhapur and Sangli districts) in partnership with Dalmia Bharat Sugars Industries Limited (DBSIL). Objective of this project is to promote the practices that are supportive to regenerative and sustainable practices (increase soil health, water use efficiency, reduction in carbon and water foot prints).

More than 350 Demo Plots have been established in Uttar Pradesh, Karnataka and Maharashtra to show the good agriculture practices (GAPs) to farmers. More than 140,00 farmers have been trained during the year, through face to face/ technology based training programmes.

Under the Smart Agri Project (SAP) Solidaridad supported around 98000 farmers in Uttar Pradesh so that they could develop their resilience toward climate change and environmental vulnerability. 30 Automatic/ Weather stations were installed to provide weekly advisories to farmers on various aspects viz. temperature, humidity (important from the pest & disease perspective), rain fall (from the irrigation perspective), wind velocity and direction (from crop management perspective) and sowing of inter crops (from soil health perspective).

Under Regenerative and Sustainable Sugarcane project in Maharashtra, 150 farmers have been piloted with vermi bed. After getting the vermi bed, farmers started producing vermi compost and substituted the product with synthetic chemical fertilisers. Solidaridad also supported sugar mills (in Kolhapur and Sangli) to give press mud (a waste by-product that comes after filtering the cane juice but rich in terms of micro nutrients) to farmers so that they could use them and make their land nutrient rich.

In Karnataka 100 farmers were supported with Bio-Digestors so that farmers can utilise the cow-dung, available with them, to make fuel (bio gas) at their home. The slurry, generated after production of bio gas could further be utilised in farmer's field as compost. The availability of bio gas of these 100 farmers has also supported the environment in reduction of 50 tons (Approx.) equivalent to CO<sub>2</sub> emission during the one year time period.

During the year measures have been taken to reduce the input costs of the farmers in their agriculture practices. In line of this more than 1000 farmers in Uttar Pradesh and 150 farmers in Maharashtra were promoted to use Soil Moisture indicators (SMI). This SMI is a device that given information related to availability of moisture (level of water stress) in-side the soil. The farmers were trained to use this device by putting the sensors, attached with the device, close to root zones of sugarcane crop. After getting the reading, related to soil stress, they were suggested to irrigate the field.

The result of this pilot was very encouraging. Almost all the farmers who used the SMI, shared that they have been able to reduce at least one round of irrigation in their field. In number terms, one irrigation (Flood method) consumes around 4 lakhs litre/acre costing around INR 2000-3000. By using SMIs farmers have been able to save the money as well as a very precious natural resource – ground water. Some of the farmers have also been able to save two rounds of irrigation and therefore they have been able to save more money and utilised lesser amount of ground water, from their field.

In Karnataka where farmers were piloted with Bio-Digestors, shared that with the help of bio-digestor they have been able to save around INR 800-850 per month (INR 10,000 per year/bio digester, approx.). Along with that they have also been able to reduce their fertiliser cost by INR 2000-2500 per year.

During the year, 1150 farmers from Maharashtra and Uttar Pradesh have been piloted with Vermi Beds. These farmers were also supported with training and exposed with vermi compost making processes. After having the beds and training many farmers are now producing vermi compost and using that into their fields. This pilot has supported farmers to improve the soil health in their fields. More than that these farmers have also been able to reduce their costs on fertiliser by INR 2000-2500 per year. Some of the farmers have also been able to sell vermi culture and have earned around INR 3500-4000 in a year.

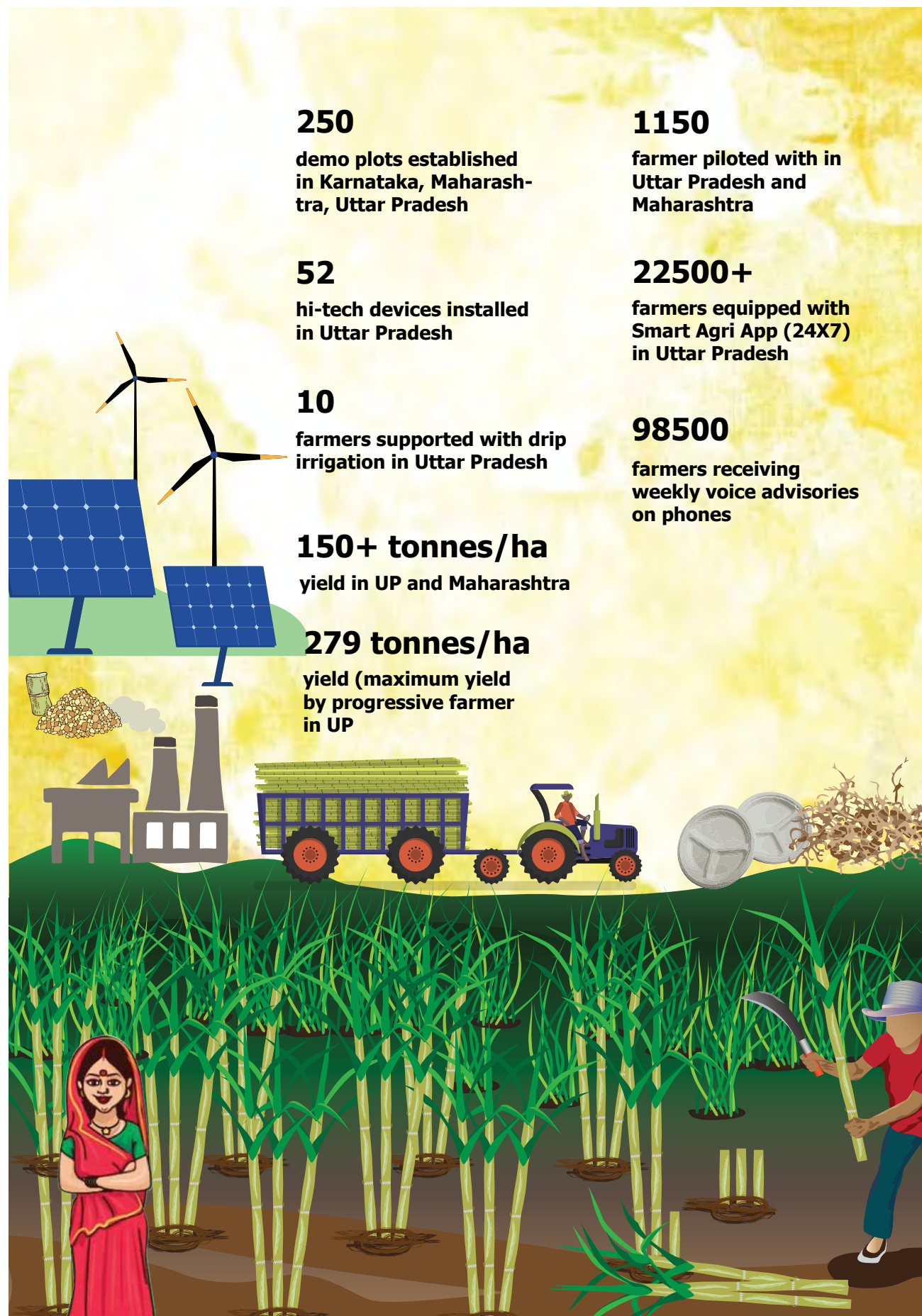
During the year focus under different interventions were made upon the women engagement. Keeping this aspect in mind women farmers were promoted to establish Demo Plots. By having a demo plot in their field women farmers were able to attend training programme on GAPs. To support the women farmers, further, in Maharashtra 100 women farmers were taken to Vasantdada Sugar Institute (VSI, Pune) on a three-days training cum exposure visit. During this programme women farmers learnt about nursery raising under sugarcane cultivation, They also learnt about the seed selection, seed cutting, seed treatment and transplantation of seedlings during this training programme.

Similarly, a batch of 50 women farmers attended a day long training programme at Regional Agriculture Management and Extension Training Institute (RAMETI, Kolhapur). The objective of this programme was to learn about the crops that can go with sugarcane as intercrop as give nutritional value to increase the health of farmers' families. In Uttar Pradesh, Automatic Weather Station (AWS) has been installed on one of the women demo plot holders. With the help of this AWS the women farmer is now getting right information about the weather condition around her field. Apart from this, she has been able to know the bio mass that is generated in her field to sequester the carbon and soil organic matter. All these support, exposure and training have been able to generate confidence among the women farmers on agriculture and businesses related to it.

## KEY RESULTS

- With the help of pilots made and support given to farmers during the year, majority of farmers have been able to take good crop as well yield from their farming activities. This could be corroborated with the data of sugar mills who have been able to crush highest amount of sugarcane. All the four mills in Karnataka where farmers have been supported, are able to break their past records.
- In Uttar Pradesh also farmers were able to supply huge amount of sugarcane to mills and that resulted in the production of and fulfilling the demand for Ethanol in the state.
- Despite low rain fall, farmers of Uttar Pradesh were able to manage their irrigation cycle by using the Soil Moisture Indicator.

## ACHIEVEMENTS



## THE CHANGE MAKER

## SUSTAINABLE PATH TO PROFIT

36-years-old Muttappa Appasab Mirji is a small farmer with a large joint family, consisting of the families of his two other brothers. Between them, the three brothers owned just three acres of land which provided very little for the family. Farming entirely depended on rains, the harvest was not enough to feed the family and they toiled in others field for very little money.

Muttappa, who discontinued education after his 10th grade, had to earn because he was the eldest son of the family, so he went to the neighbouring state of Maharashtra to work as a labourer, harvesting sugarcane for four years. That gave him money to buy another acre of land. On this one acre, they grew sugarcane purchasing water from a neighbour who had installed a pipeline from a nearby river for Rs 12,000 for one acre for over a year.

Later, the family availed of a crop loan meant for small farmers with which they set up a piped water supply from the Krishna River, six kilometres away. With the pipeline in place, they expanded their area under sugarcane production to cover all their land. As the money began trickling in, they became prudent of their investments.

Just about the same time, a team from Solidaridad arrived at Muttappa's village of Tubachi in Bagalkot district. The advice given by the scientists and experts of Solidaridad made sense to Muttappa and he became a regular participant at the organisation's meetings in the village. Muttappa's experiment with spreading sugarcane trash leaves on the farm floor was an eye-opener. As a small farmer, he was always looking for ways to cut corners and economise on time so that he could do something else, like tending to the cows and buffaloes. Trash mulching was exactly a corner-cutting exercise – it helped him reduce his procurement of fertilisers while also reducing his time to remove weeds from the field.

In March 2022, Muttappa received a biodigester. He had heard of gohar gas, but dismissed it because, at their modest village home, there was no space for gohar gas. They were happy burning fuelwood and cow dung cakes. However, he changed his mind when the Solidaridad staff on the ground told him that the cooking gas was just a by-product and that the real product would be slurry that would help him reduce his fertiliser costs. He was also given to understand how much he would save on agrochemicals and also the extra yield that would be possible due to the biodigester.

Today, Muttappa has kept aside 10 drums that can hold 200 litres of slurry for application throughout the field after mixing with water. Earlier, Muttappa used 20 bags of fertilisers for every acre he cultivated. But now, his consumption of factory-made chemical fertilisers has come down to 12 bags to an acre. He now realises how much harm the agrochemicals did to the earthworm population.

Cattle farming also became a priority for Muttappa and his family. Earlier, he kept the cows for their milk and dung to produce farmyard manure. His thought process changed and he understood the benefits of cattle feeds and fodder rather than leaving the cows to graze on their own. He is growing napier grass on a small plot and has even taken land on lease to grow more fodder since he understands that a good quality feed will produce better quality of milk and slurry.





**TEA**





## STRENGTHENING SMALL TEA GROWERS

Small Tea Growers (STGs) are an essential component of India's tea supply chains. They contribute almost 50% of India's total tea production. The STGs perpetually suffer from a low ROI against the rising cost of production. In addition, a looming climate change threatens the yield and quality of produce — heavy rainfall proves costlier for growers who are forced to use more fertilisers and pesticides to maintain soil fertility, adding to their cost burden.

Nevertheless, despite best attempts, STGs have remained beyond the scope of any significant certification schemes until 2019.



**On Farm:** The challenges include low yields, low quality, susceptibility to climate change related issues like new pest attacks and erratic rainfalls, indiscriminate use of harmful and sometimes banned chemicals, ecologically harmful farm practices and poor post-harvest management leading to leaf damage and leaf rejection by the factories.

**Off Farm:** Inability to aggregate their inputs and outputs making cost of production high and price realisation remaining low. There is absolutely no linkage with the tea packers leading to lack of traceability and price realisation.



## A DIGITAL GATEWAY TOWARDS TRANSFORMATION

The TRINITEA programme aims at helping the STGs move up the value chain. The programme aims to improve the social, economic, agronomic and environmental performances of the STGs. As a self-assessment framework, TRINITEA is available in the form of a simple android application in local languages. The programme has been designed to promote good agri - cultural practices, improve farm yield and quality, introduce climate-adaptive farming and create digital supply chains. It aims at bringing the interventions to scale and facilitating sectorial transformation in the Indian tea sector.



To improve the social, economic, agronomic and environmental performances of STGs across India



To set up a multi-stakeholder governance mechanism for making smallholder production more competitive



To support tea packers to source traceable and safe tea from the smallholders and the estates



During the last 1.5 decades, the production share of the Indian small tea sector has gone up from 25% to 52% and the production share of the organised sector (big tea plantations) have declined from 75% to 48%. Overall growth figures of 'all India production' was mainly fuelled by the growing contribution of the small grower sector. This sector is expected to increase its share further in the coming years. Major tea exporting countries like Kenya and Sri Lanka depend heavily on small holders' production for tea exports, where quality is a key factor for fetching competitive prices. On the other hand, Indian small growers, despite their 52% share in tea production, does not reckon when export efforts are considered. Thus, in spite of having more volume it doesn't fetch better prices. The entire production depends on the domestic market owing to the medium category of tea quality. The primary aim of the TRINITEA programme is to improve the quality profile of the small tea sector and make it export worthy and enable remunerative returns for STGs' produce.

The registration and training of STGs on TRINITEA framework and the seasonal trainings led by Solidaridad and tea experts on tea plantation management; and follow-up with growers to comply with TRINITEA requirements have been done with the overall aim to link them to manufacturers of good quality teas. The "traceability app" is being rolled out which would gradually help digitize the green leaf supply chain and provide assurance to the manufacturers for tracing and tracking the source of green leaf supplied to their factories. It is also being strived to find markets by showcasing the teas made in such factories in the international markets and pitch for tea packaging companies to join the programme. The programme is being implemented with the active cooperation of Small Tea Growers' Associations (STGA) and it has been well received by all STGs and factories. The STGs are now well conversant with the modern crop husbandry techniques with regard to upkeep and maintenance of tea plantations. The training and field demonstrations have become an eye opener for the growers. More STGs are coming forth to join the programme and the demand for more field demonstrations on good practices such as pruning, tipping and plucking, safe use of pesticides is growing.

# ACHIEVEMENTS

**60,240 ha**

of land brought under climate management practices

**102,866 STGs**

adopted good practices & complying with the TRINITEA framework increase of INR 4.24/kg from INR 13.76 in 2019 to INR 18 in 2022

**522**

farmers brought down the fertilizer load by 67%, 12% increase in crop yield compared to past four years.

**INR 13,186**

reduction in average spending on fertilizers/Ha (INR 43,584 (before) to INR 30,398 (after))

**82%**

growers not burning residual biomass

**97%**

growers' farming activities did not impact native flora and fauna

**87%**

growers not using toxic chemicals

**79%**

growers did not burn any waste & by-products

**94%**

growers ensuring economical use of water to reduce waste

**91%**

growers did not dump any waste into water bodies.

**78%**

growers provide hand-washing facilities within the farm



**8510**

women smallholders (legal owners of land) oriented under TRINITEA

**62%**

women temporary workers engaged by TRINITEA registered farmers

**97%**

growers ensure no sexual abuse, coercion, or threat to permanent or casual workers

**90%**

growers ensure access to safe drinking water in the farm



INDICATORS	2019	2020	2021	2022
% of growers not discriminating in payment of wages due to disability	75.7%	95.3%	95.4%	95.8%
% of growers ensure that all people on the farm have access to safe drinking water	88.0%	90.0%	97.1%	92.7%
% of growers provide hand-washing facilities within the farm	59.7%	76.1%	85.5%	80.0%
% of growers do timely payments to their workers as per the rates mandated under the law	83.9%	92.2%	99.4%	96.9%
% of growers pay equal cash wages for equal work for permanent and temporary workers	84.6%	93.4%	99.4%	96.6%
% of growers give equal treatment to all their permanent or casual workers without any bias	88.3%	96.8%	99.6%	98.7%
% of growers provide right to their workers to freely practice their religion or fulfil needs relating to cultural background, disability, gender and sexual orientation	86.1%	96.9%	99.8%	98.5%
% of growers ensure that there is no sexual abuse, coercion or threat to my permanent or casual workers through behavior, gestures, language or physical contact	88.6%	97.3%	99.5%	98.6%
% of growers prohibit the use of any form of forced and bonded labor	87.2%	97.3%	99.6%	98.8%
% of growers ensure that in their farm, daily working hours for permanent and temporary workers do not exceed the maximum number of hours set by national regulations	86.4%	94.5%	99.4%	97.5%
% of growers do not hire any worker below the age of 14 years	89.6%	97.8%	99.6%	98.9%
% of growers do not make deductions from wages for disciplinary purposes beyond the provisions of the law	86.4%	97.8%	99.5%	98.3%
% of growers do not prohibit their workers from exercising their right to establish, join or actively participate in an association of their choice	84.0%	96.2%	98.8%	98.0%



## THE CHANGE MAKER

Indrani Goswami is an organic tea farmer-entrepreneur in Phillobari, Assam who is an inspiration for the women in her area, in terms of attaining economic independence.

Originally a conventional tea-growing farmer, Indrani was shocked when she lost her father-in-law to cancer. Later, when she learnt the virtues of green and organic tea in treating stubborn diseases and health conditions, she switched to organic farming.

Indrani had to struggle for a while because of the lack of proper guidance in tea cultivation, as well as access to the market. When the Trinitea programme, implemented by Solidaridad, was started in 2019 in Tinsukia District, Assam, she joined the programme and learned the good and sustainable practices of tea cultivation, which helped her in maintaining the health of her farm and accessing a better market. Her USP is hand-rolled special tea.

Indrani thanks Solidaridad's Trinitea programme for directing her towards sustainable agricultural practices. "My venture for organic farming has motivated many farmers to switch to natural and organic farming. Looking at me, as a woman entrepreneur of the village, a number of village women are coming forward for their self-economic growth."

Today, Indrani is also running her handloom centre that imparts skill development programmes for young women from her district.

Indrani is an example of one of the successes of Solidaridad's Trinitea programme in ushering in gender inclusion and empowerment in the tea sector. Ever since the first pilot of Trinitea was launched, women empowerment has been at the forefront- with at least 8,510 women now part of its assessment framework. Furthermore, the transformation engineered by Trinitea has initiated gradual improvement in the conditions of women workers.



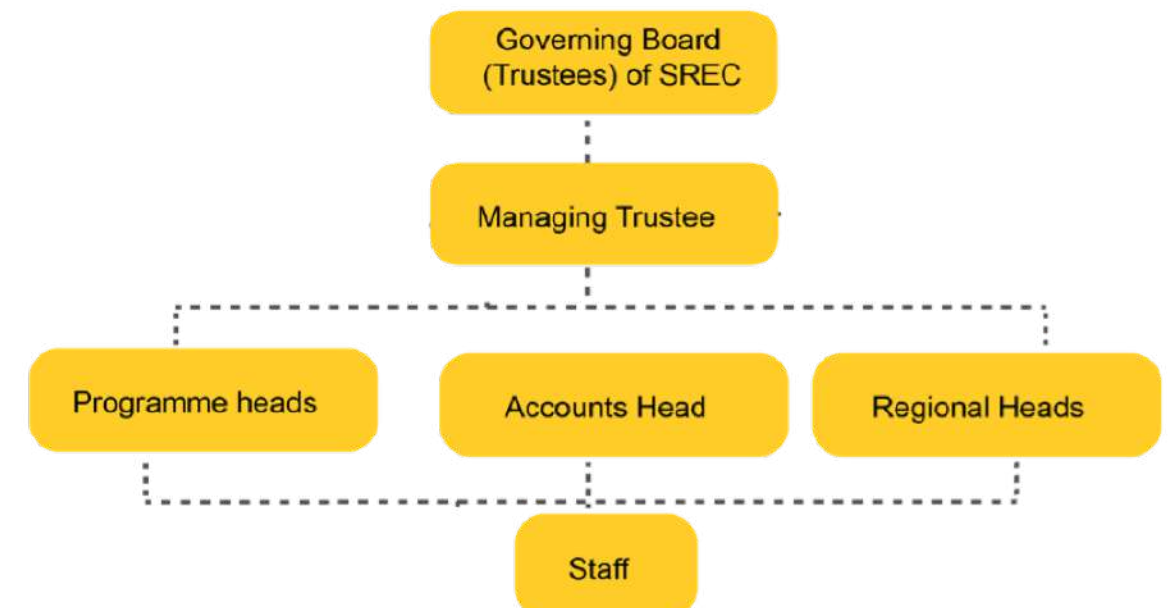
## HUMAN RESOURCE



### ORGANISATIONAL STRUCTURE & GOVERNANCE

Solidaridad Regional Expertise Centre (SREC) is an NGO registered under the Indian Registration Act, 1908. The certificate has been issued by the Sub Registrar of Janakpuri, New Delhi, under Section 60 of the act with the registration number 17474 in additional Book No.4 Volume No. 12384 on page 113 to 126 on 18 December 2008.

SREC satisfies the conditions of u/s 80G of the Income Tax Act of 1961 and is also registered under Section 12 A of the Income Tax Act of 1961.



### INCLUSIVE POLICY, DECISION AND HR SYSTEMS DEVELOPMENT

SREC is firmly committed to a policy of equal opportunity in all HR practices based on performance and competences. We provide an environment that is free of harassment of any kind, including harassments related to sex, race, ethnic origin, religious beliefs, caste, age, nationality, disability or sexual orientation among others. We are inclined to engage with well-trained and motivated people, who ensure high standards of competence, through a transparent recruitment and selection process while providing equal opportunities to all applicants.

### FUTURE-READY WORKFORCE

The organisation's human resource philosophy is to provide and nurture a congenial work culture to help employees strive for growth and excellence in their work. The development of people is the primary responsibility of the organisation and we strongly believe that if an environment is created where individuals can develop their competencies, people can and will do their best. During 2019-2020, several initiatives were taken to build capacity of the young talent within the organisation. SREC recognises the importance of the staff's ongoing performance, while also realising the relevance of staff training and development, which refers to activities that improve an organisation's ability to achieve its mission or a person's ability to define and realise his/her goals and to do his/her job more effectively. The premise of the HR cycle and the performance and talent management system is a continual (formal and informal) dialogue between employees and their line managers.

### SAFE AND HAPPY ENVIRONMENT

The organisation values the individual needs of staff, intern and other associates, and commits to providing an environment that facilitates work and life balance. Our constant endeavour has been:

- To provide appropriate working conditions and resources to enable the staff to work efficiently and support them to realise their potential
- To respect and be sensitive to the needs of the staff throughout the employment relationship, building a high-performance culture
- To demonstrate a passion for quality
- It is our constant endeavour to explore alternatives in the ways of working that embrace and harmonise all important areas of our lives.

### EXCITING PLACE FOR INNOVATIONS

The organisation seeks to achieve sustainable employability for its employees and encourages and facilitates their personal and professional development. The employer and the employee are jointly responsible for ensuring that the employee remains competent, engaged, motivated and fit. The process of staff development complements the organisation's strategy, especially the ethos of being a learning organisation. The capacity building trainings are broadly on:

- Knowledge and technical skills
- Attitude and competencies of individuals
- Leadership

### GENDER-INCLUSIVE ENVIRONMENT

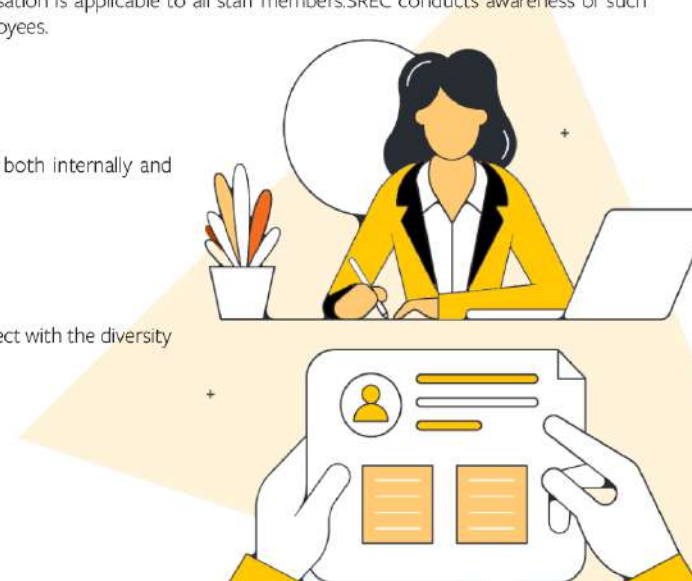
SREC is an equal opportunity employer and does not discriminate on the basis of gender, caste, religion, race, disability etc. Women are highly encouraged to apply for suitable positions in the organisation. SREC has been constantly working towards improving the gender balance within its teams. SREC's anti-Harassment policy applies to all employees and protects them from harassment by co-workers, seniors, and any other individual at the workplace. The Code of Conduct and Good Practices (CCGP) of the organisation is applicable to all staff members. SREC conducts awareness of such policies through workshops and during the onboarding process of new employees.

### GOVERNANCE AND INTEGRITY

SREC is committed to operate with integrity and respect towards people, both internally and externally, while performing its activities.

### SUBSIDIARITY AND LOCAL CULTURE INTEGRATION

We acknowledge and value the diversity of our employees as much as we respect with the diversity of the communities we work with.



## HUMAN RESOURCES, STAFF AND MANAGEMENT

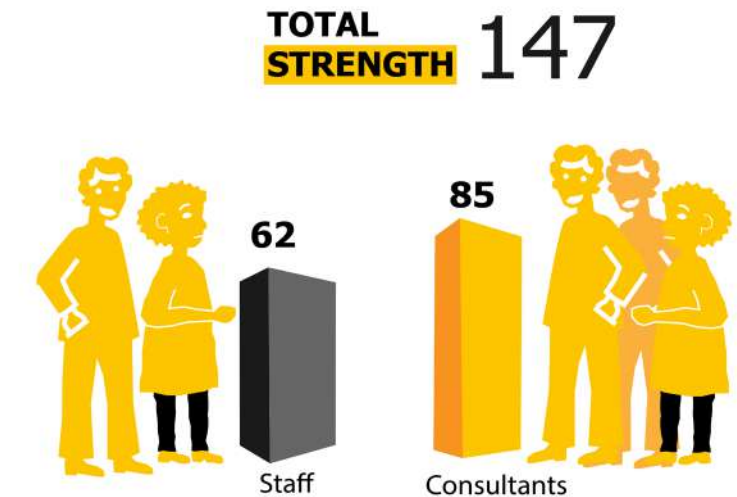
SREC has a well defined human resource (HR) policy, which is an attempt to document prevalent organisational practices and norms in a standardised format for user-friendly reference. This HR Policy contains the key policies, goals, benefits and expectations of SREC and other information an employee will need in the course of seeking employment in the organisation.

## ISO 9001-2008 CERTIFIED

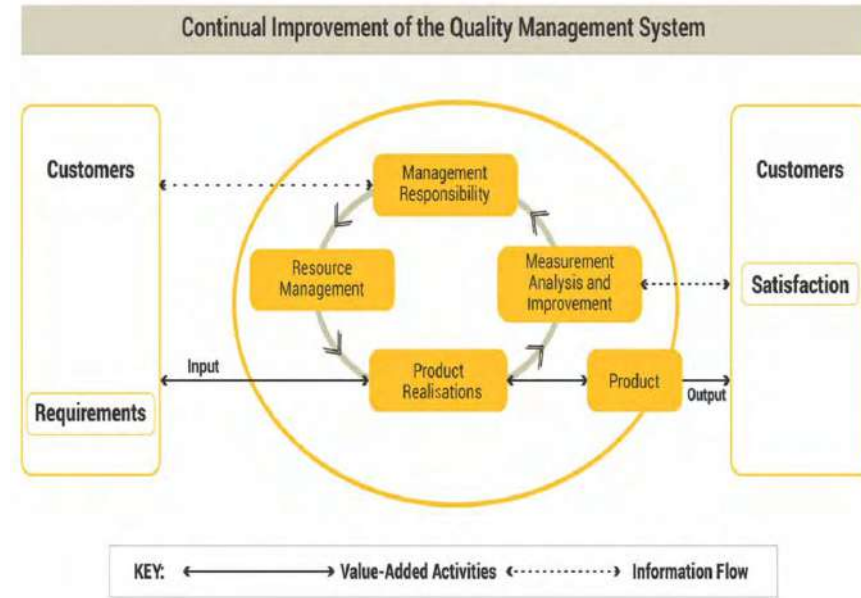
Solidaridad Regional Expertise Centre is certified under ISO 9001-2008 since 9 September 2009. The purpose of the certification is to follow a globally accepted quality management of the work in order to:

- Demonstrate our ability to consistently provide services that meet applicable statutory and regulatory requirements of donors and beneficiaries.
- Enhance donors' and beneficiaries' interest and satisfaction through effective application of the system, including processes for continual improvement of the system and the assurance of conformity to donor and applicable statutory and regulatory requirements.

## EMPLOYEE STRENGTH 2021-2022



## DECISION-MAKING PROCESS IN SREC



### THE PROGRAMMES IN SREC ARE DEVELOPED AS PER FOLLOWING:

1. The programme team under the supervision of the Managing Trustee Managing director ) develops multi-annual strategy plan (MASP) within India.

These MASPs are in line with local priorities and in alignment with government plans.

2. The MASP is then placed for consultation before the Board of Trustees and inputs are collected.
3. The MASP serves as the basis for the preparation of annual plans by the Managing Director, which are again deliberated and approved by the Board of Trustees.
4. The overall responsibility of managing and implementing the programmes and projects in line with MASP lies with the Managing Director. The Managing Director further delegates this function to programme coordinators.
5. Each commodity has a coordinator or manager assigned in SREC who are overall responsible for the project implementation.
6. Each project is registered by the Programme Support Officer (PSO) in SREC under the overall supervision of the Manager-Accounts and Administration of SREC.

The Admin & Accounts Manager, along with the PSO, registers the project in a database where a unique number is generated. With the number on the project, the PSO makes a digital file. In this file, all the important documents of the project are saved. Each digital project folder should have at least the following elements:



**Reporting:** Every month, staff meetings are organised in SREC to evaluate and discuss the progress of different programmes, and if necessary, corrective actions are taken. The key outcomes of the monthly meetings are documented and preserved in hard and soft copies. An annual overall report, along with audited financial statement, is prepared as well.

## FINANCIAL STATEMENT 2021-2022

# DHINGRA & JUNEJA

## Chartered Accountants

13/82, LGF, Vikram Vihar  
Lajpat Nagar-IV, New Delhi-110024  
Tel. : 011-41729407, 46103248, 9811991182  
E-mail : [vdhingra1231@gmail.com](mailto:vdhingra1231@gmail.com)  
[Vikas.dhingra@dhingrajuneja.com](mailto:Vikas.dhingra@dhingrajuneja.com)

### Extract of Independent auditor's report of the trustees of the Solidaridad Regional Expertise Centre

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information so required and give a true and fair view in conformity with the accounting principles generally accepted in India:

- a) In the case of Balance Sheet of the state of affairs of the Trust as at 31st March 2022,  
and
- b) In the case of Statement of Income and Expenditure, of the excess of expenditure over income for the period from 1 April, 2021 to 31st March 2022.

For Dhingra & Juneja  
Chartered Accountants

Firm Registration Number: 018799N

**VIKAS**  
**DHINGRA**

Digitally signed by  
VIKAS DHINGRA  
Date: 2023.02.07  
14:57:37 +05'30'

Vikas Dhingra  
(Partner)  
Membership No: 099604  
UDIN: 23099604BGQMPN5224

Date: February 07, 2023  
Place: New Delhi

Funding Agencies	Source of Fund	Purpose
Vippy Industries Limited	Local	To implement the Project on "India Sustainable Soy Program"
Mahindra & Mahindra Limited	Local	Farmer Support Programme for Sustainable Agriculture and Livelihood Enhancement
Indian Institute of Soybean Research	Local	Front line demonstrations of Soybean
Jayant Agro Organics Limited	Local	Sustainable Castor Initiative "Pragati"
Vodafone Foundation	Local	Smart Agri : Leveraging technology for self subsistence to enterprise farming
The Solvent Extractors Association of India	Local	SEA - Solidaridad Sustainable Rapeseed-Mustard Mission
Huawei Telecommunication Co,Pvt.Limited	Local	Smart Agri : Leveraging technology for self subsistence to enterprise farming
Laudes Foundation	Foreign	Establishing an Organic Cotton Hotspot in Maharashtra, India
European Union	Foreign	Effective waste management and sustainable development of the MSME tanning companies in the Kolkata Leather Cluster
Solidaridad Network Asia Limited	Foreign	To support farmer in Sustainable production in agriculture & industry, combined with sustainable trade and significant contribution to combat poverty and preserving people's environment, in the context of a global economy
Bayer AG	Foreign	To Promoting the implementation of good Agricultural Practices to Ensure high production in a safe working conditions
Reliance Foundation	Local	Through the "Inclusion through Integration - Women in Formal Dairy Supply chains"

#### Statements of Financial Position

	As at 31st March 2020	As at 31st March 2021	As at 31st March 2022
<b>Funds &amp; Liabilities</b>			
- Trust Fund	10,000	10,000	10,000
- Capital Fund	35,74,660	1,27,66,782	2,98,09,704
<b>(Represented by Fixed Assets)</b>			
- Restricted Fund	5,19,98,030	15,94,20,504	18,41,80,454
- General Fund			
Towards general objectives of the Trust	59,25,081	1,09,43,463	(17,43,964)
Towards specific objectives of the Trust	96,26,000	96,26,000	96,26,000
- Current Liabilities & Provisions	55,18,407	79,54,851	4,10,26,441
	<b>7,66,52,178</b>	<b>20,07,21,600</b>	<b>26,29,08,635</b>
<b>Property &amp; Assets</b>			
- Fixed Assets			
Gross Block	1,26,61,218	2,45,37,248	4,80,36,478
Less: Accumulated Depreciation	75,92,469	1,04,85,419	1,67,64,788
Net Block	50,68,749	1,40,51,829	3,12,71,690
- Current Assets and Loans & Advances			
Cash & Bank Balances	6,54,26,399	17,32,94,173	21,08,37,092
Other Current Assets	27,05,550	80,73,407	60,46,519
Loans & Advances	34,51,480	53,02,191	1,47,53,334
	<b>7,66,52,178</b>	<b>20,07,21,600</b>	<b>26,29,08,635</b>

#### Statements of Activities

Particulars	Financial Year 2019-20	Financial Year 2020-21	Financial Year 2021-22
<b>Revenues</b>			
Restricted Income (Grants & Donations)	4,86,20,671	12,30,96,679	31,78,89,534
Unrestricted Income			
Overhead Support	45,13,249	64,88,118	1,31,79,275
Interest from Bank	7,18,110	17,13,901	40,34,646
Voluntary Contribution (Donation)	2,91,005	4,92,000	8,97,600
Other Income	-	7,60,877	-
	<b>5,41,43,035</b>	<b>13,25,51,575</b>	<b>33,60,01,055</b>
<b>Expenses</b>			
Programme Related Expenses	4,86,20,671	12,30,96,679	31,97,91,345
Management & General Expenses	75,57,946	48,10,489	2,88,97,137
<b>Total Expenses</b>	<b>5,61,78,617</b>	<b>12,79,07,168</b>	<b>34,86,88,482</b>
Surplus/(Deficit) for the year	(20,35,582)	46,44,407	(1,26,87,427)
<b>Changes in Net Assets</b>	<b>(20,35,582)</b>	<b>46,44,407</b>	<b>(1,26,87,427)</b>



**Solidaridad**

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