



# **OORJA 2022**

## **ANNUAL REPORT**



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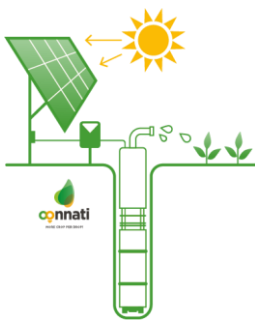


# INTRODUCTION

**Oorja** is a Farming as a Service company working at the intersection of sustainable agriculture and renewable energy. It provides solar-powered services of irrigation, milling and cooling and climate-smart advisory to smallholder farmers who were previously reliant on diesel engines for their on-farm energy needs.

Oorja offers a climate-smart platform for smallholder farmers to become profitable and sustainable.

We have pioneered the Pay Per Use business model in the agriculture sector. Oorja installs and maintains community-scale solar infrastructure at the farm and sells farming services that are affordable, inclusive, reliable, low-carbon and climate-smart.



## IRRIGATION -AS-A-SERVICE

A solution for farmers to increase their income by saving on diesel fuel for irrigation and growing crops year-round.



## MILLING -AS-A-SERVICE

A solution for farming households to save time and money by milling their grains and spices cost-effectively at the village level.



## COOLING -AS-A-SERVICE

A solution for traders and farmers to increase their income by keeping their produce fresh for longer and reducing food waste.

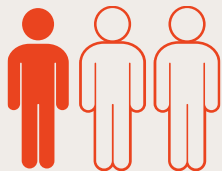


## FARMER ADVISORY

A solution for farmers to increase their productivity and income and increase efficiency of input use by learning and adopting climate-smart agricultural practices.

# ABOUT US

## MISSION



Empower  
**1 million**  
people globally by 2030



Provide smallholders with  
**essential farming** services



Sustainably increase their  
income and quality of life

## VISION

Oorja is a purpose-driven social enterprise working at the intersection of sustainable agriculture and renewable energy. Oorja aims to:

- reduce reliance on fossil fuels and chemical inputs
- increase agricultural productivity and farmers' income
- mitigate carbon emissions and build climate-resilience.





# AREA COVERAGE & EXPANSION MAP

## Current operational areas

### Uttar Pradesh

Bahraich  
Shravasti  
Hardoi  
Lucknow  
Barabanki

### Bihar

Muzaffarpur  
Samastipur

## Expansion Plans

### Uttar Pradesh

Sitapur  
Unnao  
Lakhimpur Kheri

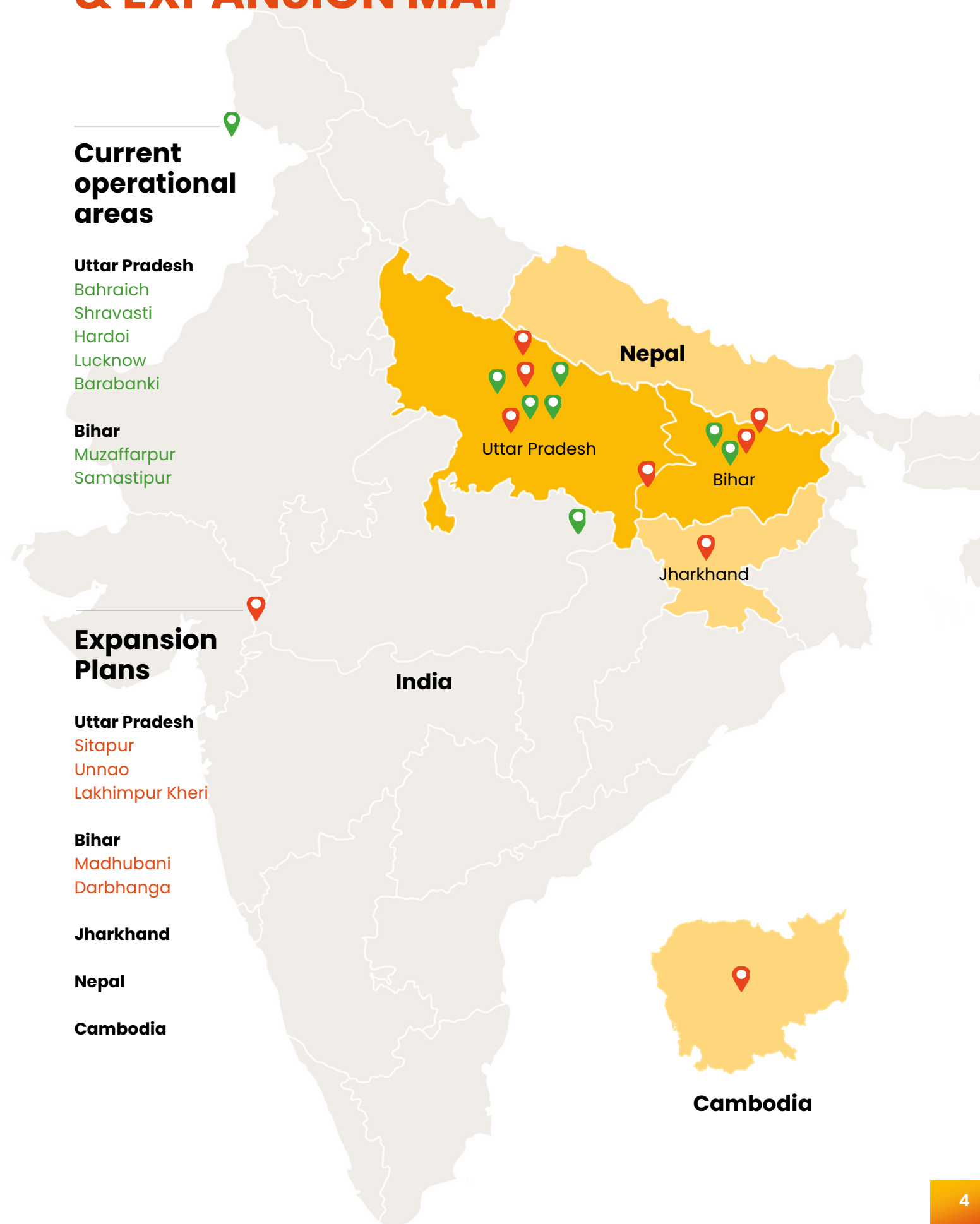
### Bihar

Madhubani  
Darbhanga

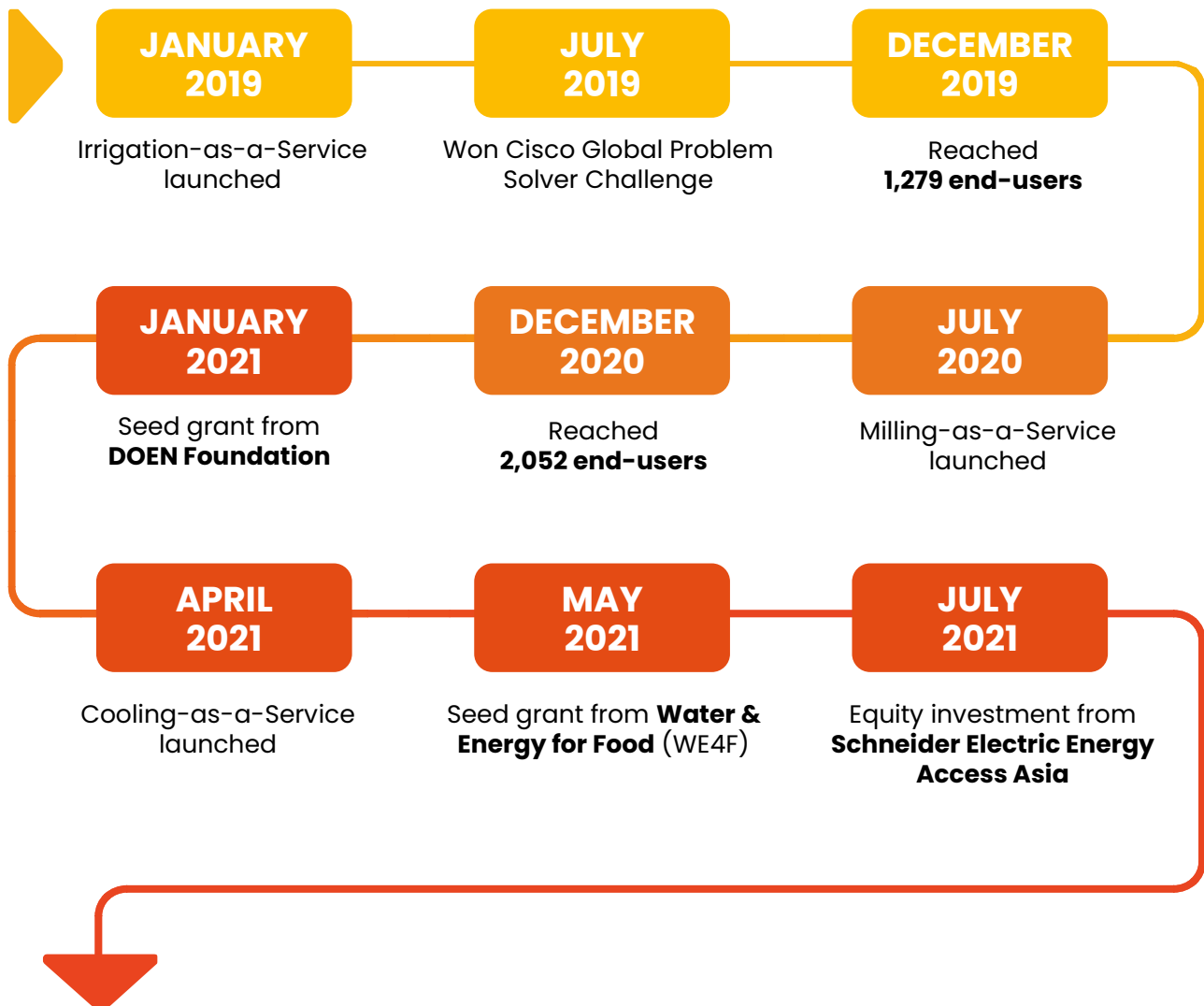
### Jharkhand

### Nepal

### Cambodia



# MILESTONES & ACHIEVEMENTS



## 2021 End

<b>48</b> Projects	<b>3</b> Districts	<b>186</b> kWp	<b>77</b> Users	<b>4,662</b> Beneficiaries	<b>5%</b> Female	Team Size <b>15</b> excl operators
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## 2022 End

<b>79</b> Projects	<b>7</b> Districts	<b>313</b> kWp	<b>2,411</b> Users	<b>14,496</b> Beneficiaries	<b>9%</b> Female	Team Size <b>20</b> excl operators
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# 2022 HIGHLIGHTS

## Impact



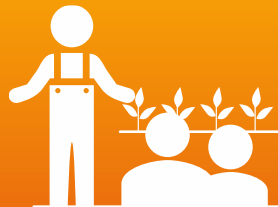
Grew customer base

**>3x**  
**to 15,000+**

Grew customer base

**3,617** acres

## New Service



**Launched Farmer Advisory** vertical to help our customers transition to **climate-smart agricultural practices**.

## Coverage



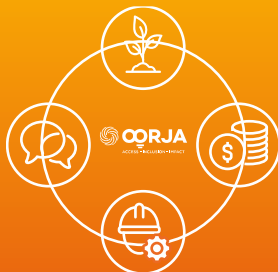
**7 districts** of northern India reaching

**2,192** male and

**217** female

customers

## Team



Brought on board experts in **agronomy, finance, engineering & communications**

## Partners



We partnered with **GIZ India, Aga Khan Foundation, Selco Foundation, HCL Foundation & GIZ Cambodia** to co-invest in new projects and scale up our services.~



# OUR CUSTOMERS



Earn  
**INR 5,000–8,000**  
(USD 60–100) per month  
per household



**Farm 1–1.5 acres**  
per household



Average household size  
**6 people**



Smallholders, women  
and low-income  
**communities.**



Rely on **agriculture**  
as their primary source  
of livelihood



Face a  
**50% yield gap**  
due to non-optimal  
farming practices

## THE OPPORTUNITY

Given access to localised, timely inputs and information



India's farmers could  
obtain **>2x higher**  
crop yields



reducing  
**GHG emissions**



**chemical**  
inputs applied



# OUR REACH & IMPACT

As of 31 December 2022

## FOOTPRINT



**79**

Solar projects



**313 kWp**

PV capacity installed



**14,454**

Beneficiaries



## FINANCIALS



**\$ 1,400,000**

Funding raised



**\$ 404,000**

Balance sheet size



**\$ 122,000**

Revenues

## SOCIAL IMPACT



**1,014**

Acres under irrigation



**2,441**

Total customers



**217**

Female customers

## ENVIRONMENTAL IMPACT



**1,060 tCO2e**

GHG emissions saved



**759 MWh**

Clean electricity generated



**36,596 kg**

Food waste saved

## ECONOMIC IMPACT



**57%**

Increase in farmer income



**\$ 21,109**

PV capacity installed



**27**

Last-mile jobs created

# LESSONS LEARNED IN 2022

## EXPANDING IRRIGATION-AS-A-SERVICE

Farmers have started expanding into a **third growing season in zayed** from March until June. Many have started to grow horticultural and cash crops, such as peppermint. Accordingly, solar pump utilisation is expected to increase by 20% year-on-year. We built our Farmer Advisory vertical to bolster this trend of crop diversification, strengthening food systems and farmers' income.

Delivering timely irrigation is essential to **reduce farmers' exposure to climate risks**, including droughts, heat spells, floods and other extreme weather. July 2022 was the month of highest irrigation sales due to a delayed monsoon and erratic rainfall, both linked to climate change. This created unprecedented demand for Oonnati services, a lifeline to farmers in severe arid conditions.

## EXPANDING COOLING-AS-A-SERVICE

The majority of cooling service users are **petty traders**, rather than farmers, who are more likely to store large quantities of perishable produce and speculate on commodity prices. This prompted us to focus on **installing new cold storage projects within mandis (marketplaces)** to be more convenient to fruit and vegetable sellers.

Refrigeration services have been used to store a wide variety of not only vegetables and fruits but also flowers, herbs, tubers, spices and seeds.

Cooling is a new offering and building awareness is essential to encourage user adoption. We conducted marketing campaigns in partnership with FPOs, FPCs and women's Self-Help Groups to inform traders and farmers about the benefits of cooling.

We also introduced a **favorable tariff based for long-term storage** to incentivise year round storage of commodities such as apple and pomegranate, in addition to short-term storage of seasonal vegetables.

## EXPANDING MILLING-AS-A-SERVICE

Aside from grinding wheat flour, our most popular use of Milling-as-a-Service, we introduced milling of pulses, rice and spices such as turmeric and chilli.

Upon request by the community, we upgraded our multipurpose pulverisers from 3 HP to 5 HP, doubling the processing capacity to 40 kg per hour, better meeting the continuous demand for milling.

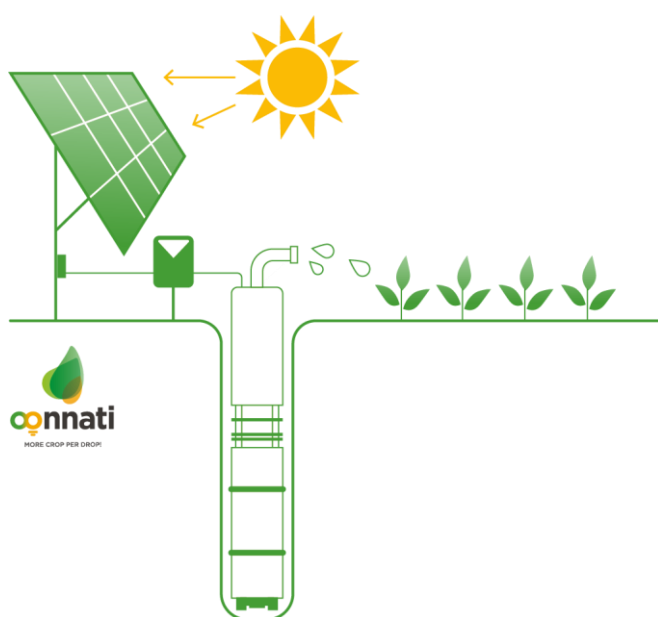


# IRRIGATION AS A SERVICE



## Pay per litre of water Available on-farm

A Pay-Per-Use community irrigation service that enable farmers to transition from diesel-based pumping to affordable and reliable solar irrigation.



**Tariff:**  
**INR 3.5 – 4 per m<sup>3</sup>**  
of water pumped

**20% cheaper**  
than diesel

## WHY SOLARISE IRRIGATION?

In Northern and Eastern India, 30 million farmers are reliant on diesel fuel, the most expensive irrigation source. Smallholders generally practice deficit irrigation of crops. This contributes to 50% lower crop yields than potential and prevents them from growing crops year-round. Diesel pumps have an immense carbon footprint, responsible for 5% of India's GHG emissions.



# IRRIGATION AS-A-SERVICE

## SOLUTION

**Oonnati** is a Pay-Per-Use affordable solar irrigation service.

Oorja installs solar BLDC and AC pumps at the farm which can irrigate up to 25 acres of land. It sells water as a service at fixed tariffs per m<sup>3</sup> of water delivered. The service is charged based on a water flowmeter reading, ensuring a transparent price. Each pump allows 15–20 farmers to access irrigation year-round on demand.

Irrigation-as-a-Service enables customers to reduce their diesel fuel expenses, irrigate regularly and precisely and grow crops year-round.



**No upfront asset cost**  
to farmers



Save **20–60%** on  
diesel-based  
irrigation



Irrigate and grow  
crops **year-round**



**Convenient** and  
**hassle-free**



Promote **low-carbon**  
agriculture



**Reduce**  
GHG emissions

## TRACTION

**63**

solar pumps  
under operation

**835**

Irrigation  
customers

**1014**

acres under  
irrigation

**1,043,752**

m<sup>3</sup> of  
water sold

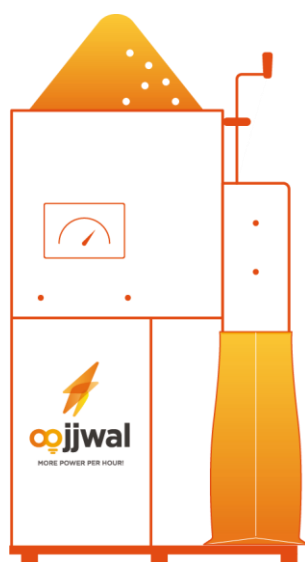


# MILLING AS-A-SERVICE



## Pay per kg of produce processed Available on-farm

A Pay-Per-Use community milling service for grinding flour, pulses, spices and other dried produce into edible food products. Service is charged based on weight processed or milling time.



**Tariff:**  
**INR 2 per kg**  
processed

**50% cheaper**  
than diesel

## WHY SOLARISE MILLING?

Women farmers are generally responsible for the labor-intensive activities of harvesting and post-harvest processing of crops. They regularly need to travel 5-10 km to highway marketplaces to visit diesel-powered mills. They pay high rates to process wheat, pulses, rice and spices into their edible form. The travel time and distance contributes to time poverty experienced by women and girls.



# MILLING AS-A-SERVICE

## SOLUTION

**Oojjwal** is a Pay Per Use affordable solar milling service.

Oorja installs multipurpose pulverisers at the farm which can process over 40 kg per hour of wheat, rice, pulses, spices and other dried produce into edible food products. Each mill serves the needs of up to 100 households. The service is charged based on weight processed, or the milling time using a vibration meter. Solar mills are integrated with solar pumps, as both are powered using the same solar PV array to maximise energy utilisation.

Milling-as-a-Service enables customers - especially women - to reduce their expenses, save time and drudgery on processing activities, and obtain high-quality food for consumption at home.



**No upfront asset cost**  
to farmers



Location  
in the village



Save up to **50%**  
compared to market  
rate for diesel milling



**Convenient** location  
in the village



Reduce travel time  
and drudgery



**Reduce**  
GHG emissions

## TRACTION

**13**  
mills  
operational

**1,454**  
milling  
customers

**45,595**  
kg milled

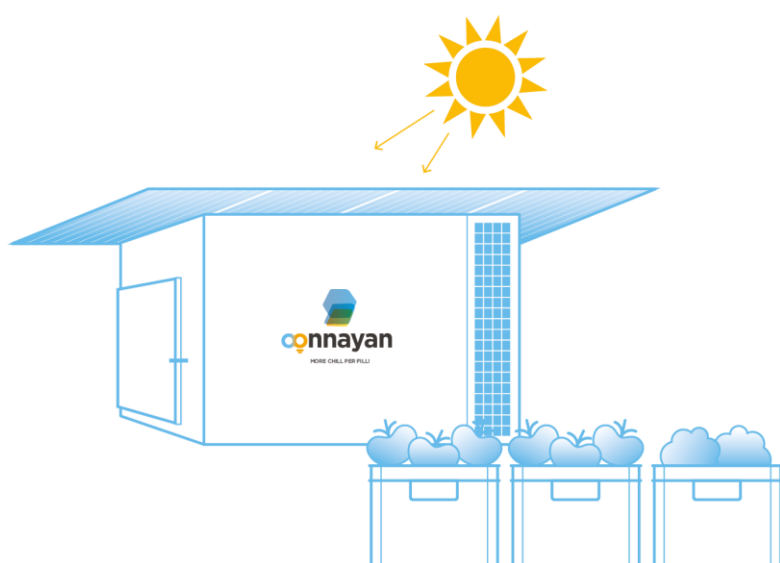


# COOLING AS-A-SERVICE



## Pay per crate per day Available at the market gate

Our post-harvest cooling service - Oonnayan is available at the market gate and enables users to extend the quality and shelf life of their products, reduce post-harvest losses and realise higher prices in the market. Users pay per-crate-per-day of produce stored.



**Tariff:**  
**INR 2 per kg**  
Processed

## WHY SOLARISE COOLING?

Cooling infrastructure is lacking and not accessible to most crop growers and traders in rural India. This contributes to spoilage and food waste of up to 30% of farmers' precious harvest. This forces growers and traders to make a distress sale of fresh produce right after harvest, when prices are at their lowest. Often, farmers make a loss and are unable to recover their investment for cultivating the crop.





# COOLING AS-A-SERVICE

## SOLUTION

**Oonnayan** is a Pay-Per-Use affordable cooling service.

Oorja installs solar cold rooms in marketplaces so that traders and farmers can access a secure, refrigerated location to store their fresh produce – right next to the point of sale. It sells cooling services based on the number of crates and number of days stored. Cold rooms can be used to store a wide variety of fresh produce, including vegetables, fruits, herbs, flowers, seeds, spices, dairy and other perishable goods.

Cooling-as-a-Service enables customers to extend produce shelf life and value, reduce food waste, and increase their profits.



**No upfront asset cost**  
to traders and farmers



**Controlled** temperature  
and humidity storage



**Extend** produce shelf  
life and value and  
increase profits



**Reduce transport costs**  
by storing unsold produce  
in the marketplace



Attractive and affordable  
**storage tariffs**



**Reduce food losses**  
post-harvest



Reduce GHG emissions

## TRACTION

**3**

cold storages  
operational

**120**

Cooling  
customers

**104.6**

tonnes of  
food stored

**36.7**

tonnes of  
food loss avoided

# OUR IMPACT ON FARMERS



## IRRIGATION-AS-A-SERVICE CUSTOMERS

**57%**

increase in annual average  
earnings per acre

**NR 5,000**

per year  
saved ozn diesel fuel for irrigation

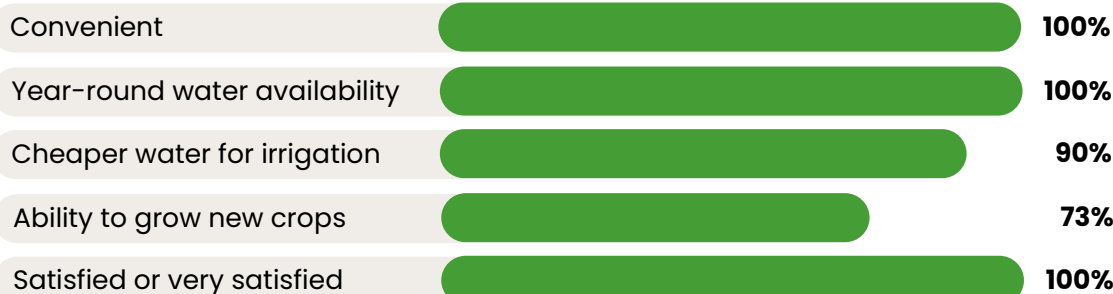
**73% of customers**

were able to grow a new crop they had never planted before.  
Oonnati customers diversified to 10+ high-yielding varieties of vegetables,  
fruits, mustard, pulses, sugarcane, peppermint, maize, etc

**65% of customers**

expanded into a new growing season in zayed (summer) 2021

### Customer feedback on Oonnati services



## MILLING-AS-A-SERVICE CUSTOMERS

### Customer feedback on Oojjwal services



# CUSTOMER TESTIMONIALS

"Previously, we could not irrigate our land on time as diesel pumps required a lot of manual labour on operation and maintenance. Now we can grow high-value crops which would give us higher yield with less investment."

– **Solar Irrigation Customer, Uttar Pradesh**



"With Oorja's affordable and reliable solar irrigation services, I had the courage to grow new high-value crops like peppermint on my farm. I want to show my neighbors that farming can be profitable with the right inputs."

– **Solar Irrigation Customer, Uttar Pradesh**



"The quality of wheat flour processed from Oorja's mill is refined and so much better than that from the diesel mill. There is no comparison in terms of quality."

– **Solar Milling Customer, Uttar Pradesh**



"I have been using the cold storage for the past 2-3 months for storing fruits like apples, pomegranate and litchi. I have been able to earn a higher price by storing the produce for a longer period of time."

– **Solar Cooling Customer, Bihar**

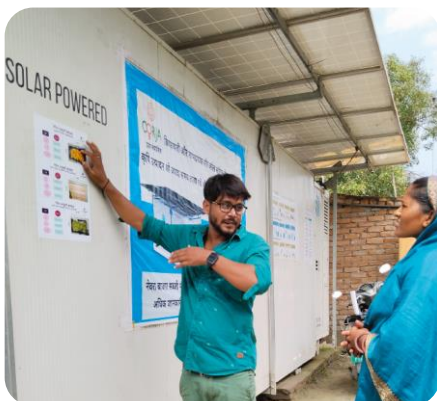




# FARMER ADVISORY SERVICES

Oorja launched farmer advisory services for its customers in order to promote climate-smart agricultural practices. This will strengthen agricultural productivity and income and boost utilisation of our irrigation, milling and cooling services.

On-field training is conducted by Oorja's highly experienced Agronomists.



## Our customers receive training in several different areas:

- Growing vegetables in kitchen gardens
- Crop rotation
- Productivity increase through system of rice intensification (SRI) and system of wheat intensification (SWI)
- Crop diversification in the zayed season
- Precise application of inputs (seeds, irrigation, fertiliser, pesticide)
- Preparation and application of organic inputs

The training is delivered in mixed classroom and practical training sessions with 30-35 participants in each session. Small packets of high value seeds were distributed to all the farmers. In the first phase of training, 500+ farmers comprising 371 men and 136 women were trained from 14 villages of Bahraich district, Uttar Pradesh.



## The benefits experienced by farmers so far:

- 30% increase in rice yield
- New crop varieties grown, including mint, a high-value crop from which oil is extracted and sold
- Increased consumption of nutritious vegetables

"I was fortunate enough to receive high quality seeds and training provided by Oorja. Within a span of just two months, I have been able to grow 15+ kgs of each new variety of vegetables like bottle gourd, peas and okra. This not only helped me feed my entire family but also earn income by selling it in the market."

**- Farmer Advisory Beneficiary, Uttar Pradesh**

## TRACTION

**500+**

farmers trained

**136**

women trained

**14**

villages covered

# GENDER MAINSTREAMING

In 2022, Oorja developed and published its Gender Mainstreaming Action Plan and launched its flagship “Krishi Sakhi” program to empower women.

Oorja's vision is to integrate women along the entire value chain of its operations as customers, employees, and to train women farmers on sustainable agricultural practices to have agency in their community and uplift their economic well-being.

## The four focal points of our plan are:

### GOAL 1



#### TO INCREASE THE PROPORTION OF WOMEN AS CUSTOMERS AND END-USERS

##### STRATEGY 1

Increase the representation of female customers from 5% baseline level to 20% by 2023 and 30% by 2027, by targeting women lead farmers and women-led households to understand their specific needs.

### GOAL 2



#### TO CREATE LOCAL JOBS FOR RURAL WOMEN

##### STRATEGY 1

Organize training sessions in the village on agronomy and climate-smart agricultural practices to boost smallholder farmers' (including women farmers') crop yields by 30% or more.

##### STRATEGY 2

Provide women farmers and rural women with quality agricultural inputs and on-field demonstration for the cultivation of high-value crops to help them earn additional income from farming.

##### STRATEGY 3

Build the technical capacity of rural women by providing them with digital, numerical and financial literacy training.

##### STRATEGY 4

Increase the recruitment of women in last-mile field positions as operators, technicians, and sales agents, targeting 20% women in field positions by 2023.

### GOAL 3



#### TO BUILD A GENDER BALANCED ORGANISATION

##### STRATEGY 1

To improve the company's ability to successfully manage a diverse workforce through proactive and regular communication with and sensitisation of employees.

##### STRATEGY 2

To increase the recruitment of women for new hires in all positions.

##### STRATEGY 3

To provide mentorship and promotional opportunities for women employees.

##### STRATEGY 4

Building a gender-balanced and inclusive organisation made up of diverse talents through proactive recruitment, family-friendly leave and workplace policies.

# PARTNERS

## INVESTORS & DONORS



## NGO PARTNERS



## TECHNOLOGY & RESEARCH PARTNERS





# MANAGEMENT TEAM



## Amit Saraogi

Co-Founder & CEO

- **25 years'** experience
- Worked at UNICEF, PwC, ABN Amro, Analysis Group
- Master's in International Development from Columbia University, New York
- VP on board of CLEAN
- Awards – Echoing Green Fellow, Opportunity Collaboration Fellow



## Dr Clementine Chambon

Co-Founder & CEO

- **9 years'** experience
- Worked as renewable energy researcher and consultant
- PhD in Biofuels from Imperial College London, MEng in Chemical Engineering from University of Cambridge
- Awards – Echoing Green Fellow, Forbes 30 Under 30, MIT 35 Under



## Dr Virendar Khatana

Director of Operations

- **30+ years** of experience in development sector
- Worked with the World Bank, GIZ, UN-CFC, Rockefeller Foundation
- Master's from JNU
- PhD from Meerut University



## Ankur Singh

Senior Manager

- **7 years'** experience in on-ground implementation and program management of development sector projects
- Worked with Craftizen Foundation, FDRVC
- Acumen Academy graduate
- MBA from IRMA



## Bindu Trivedi

Finance Executive

- Chartered Accountant
- DISA certified professional
- **5+ years** of experience in finance, accounting and auditing
- Previously ran own CA firm

## Board of Directors

- **Amit Saraogi**, Co-Founder & CEO
- **Clementine Chambon**, Co-Founder & CTO
- **Vikram Raman**, Schneider Electric Energy Access Asia

# MEET THE TEAM



The Oorja team is a group of extremely passionate and committed professionals in pursuit of a common mission.

We are an international team of agriculture professionals, researchers, engineers, farmers, scientists, teachers and community mobilisers. We work together to deliver high-impact projects with a business, social and environmental benefit.

Currently our dynamic team of 48+ individuals are spread across the remote HQ in New Delhi, Bangalore, Ahmedabad, Bhubaneswar and London as well as four operating hubs in Bahraich, Hardoi and Barabanki and Muzaffarpur districts.

“

The best part about my work is the satisfaction of creating an impact on the lives and livelihood of small and marginal farmers, including women farmers. I have learned a lot while working with Oorja such as collaboration, communication and teambuilding and managing multiple tasks. I have also witnessed the power of how a small team who is determined enough can make a huge difference for the society and environment.

**- Preeti Kumari,**  
Project Associate of Oorja

”

# SPECIAL THANKS

Oorja's team is supported by a wide range of individuals and organisations. We would like to give special thanks to several folks who have made notable contributions to growing Oorja in 2022.

## Deloitte D2i Team

The talented and enthusiastic Deloitte 2 International (D2i) team of consultant Fellows delivered high-quality outputs that included data dashboards, documented procedures, tools and systems and desk research to inform our 2-year growth strategy. We are thankful to the Fellows and to Deloitte for giving their time and expertise across multiple assignments.

## Clara Neltoft

We were fortunate to have Clara Neltoft as Gender Inclusion Intern and as Project Consultant. She organized a very successful team retreat where the entire team met in Kasauli, Himachal Pradesh in April 2022. She designed the Krishi Sakhi farmer training program and conducted on-field research in India, Nepal and Cambodia to inform the geographical expansion strategy for our services.

## Emma Sand & Cate Ralph from Santa Clara University

Emma Sand and Cate Ralph were Research Fellows from Santa Clara University. They undertook an Action Research Project with Oorja focusing on gender mainstreaming. After interviewing team members, customers and partners, their recommendations included integration of women along the entire operational value chain and strategies for expanding our services to benefit more women customers.

## Sasmita Patnaik, Technical Assistance Facilitator & Gender Advisor, WE4F

Sasmita Patnaik provided technical assistance to Oorja to enhance gender integration in the business. She helped us to internalise the business value of focusing on women as customers, employees, and partners. Sasmita proposed strategies and provided strategic guidance to help develop our Gender Mainstreaming Action Plan. She also joined Oorja's advisory board to advise on gender and equity issues.



# ROADMAP FOR 2023

## Project Deployments



Expand the reach of our farming services  
**>3x**  
to reach **50,000** end-users

## Grow Geographically



**Deepen our presence in existing and new locations** in India and pilot our services in Nepal and Cambodia.  
end-users

## Project Deployments



Provide a package of services to increase smallholder **farmers' income by 100%.**

## Climate-Smart Focus



Provide solutions to reduce use of chemical inputs, reduce farmers' exposure to climate risks and promote adoption of climate-smart agricultural practices.

## Project Deployments



Launch new types of irrigation contracts to meet the needs of under-served farmers.





# CONTACT INFORMATION

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