



GRAM OORJA

GROUP IRRIGATION IN REMOTE COMMUNITIES

June 17, 2020
ACEF



Who are we?

Gram Oorja fulfils the electricity, cooking fuel and water needs of tribal communities in the remote regions of India. We have set up over 280 community scale projects impacting over 70,000 lives

Our Solutions



69+

Micro-Grids



145+

Solar Pumps

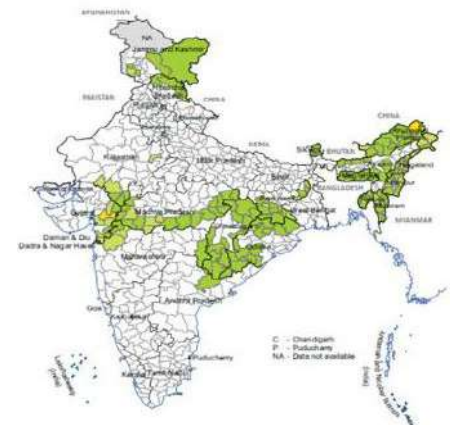


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Biogas
Cooking Grids

Where?

In villages all across the
tribal belt of India



Where we work



Where we work





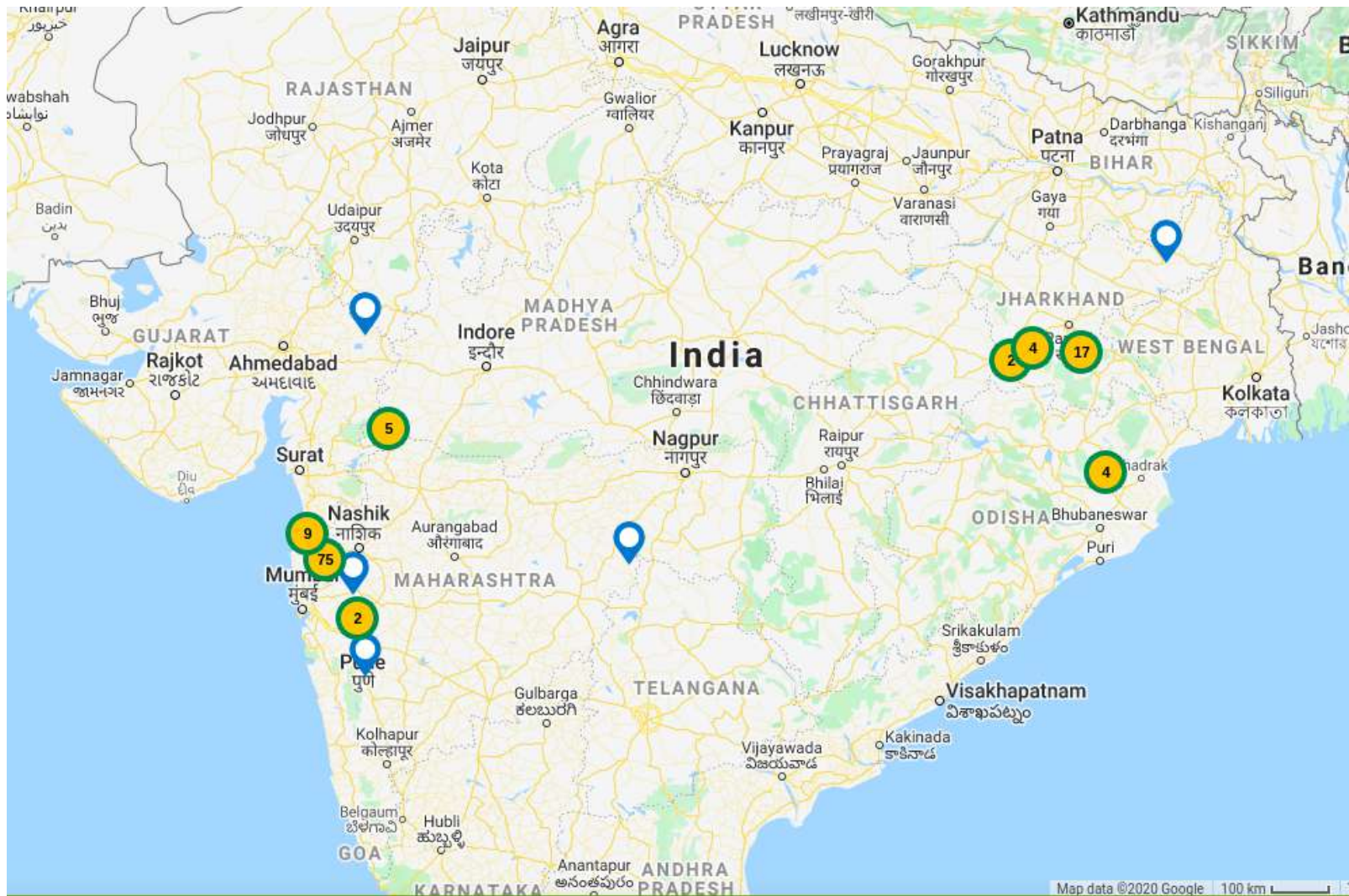
Accomplishments

- Every project has a local governing body set up for the villages by the villagers.
- Over 90 percent of projects set up are operational and continue to serve the communities.
- Earliest micro-grids and pumping systems over 8 years old.
- Independent assessment by third party evaluators show a high degree of customer satisfaction, technical, economic and institutional sustainability.

Remote Areas



Pumping Projects



Challenges faced by Farmers



- Inaccessibility and remoteness
- Water availability and usage for second crop
- High cost and unavailability of diesel
- No grid extension till farm or water source
- Unreliable supply of electricity

SOLUTIONS

निमित्तमात्रं भव

Be only an instrument

Community Interaction

- **Understand** the socio-cultural reality and needs in each community.
- **Build partnership** with local organizations providing knowledge and expertise
- Formation of groups of farmers



BAIF



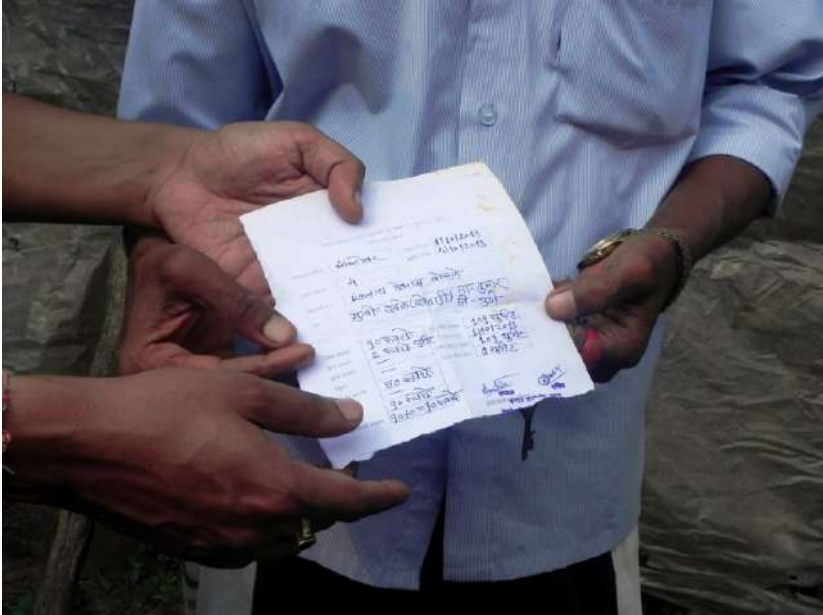
Design for Aspirations



Considerations for design of system:

- Number of Farmers in a group
- Area of farmer as well as the group
- Source of water
- Type of Irrigation
- Distance and height of farmland from water source
- Pipeline length
- Crop to be cultivated

Tariff Structure



Tariffs are fixed using a principle that it is:

- Affordable for all
- Enabling the group to be financially autonomous for long term Operations and Maintenance of pumping system

FINANCIAL

Assist farmers while opening group bank account to manage flow of deposits and accumulate savings

Tariff structure and costing mechanism is decided mutually by local organisation and farmer' groups.

Costing Mechanisms

- **Day based charges**
Fixed charges of half-day and full day for each farmer.
(For example: INR 30 per day)
Site based on this system: Saritkhel (30 HP)
- **Monthly Fixed charge**
Fixed charge for each farmer to be contributed monthly for pump usage.
(For example: INR 100 per month)
Site based on this system: Valhaipada (6 HP), Paraspada (10 HP)
- **Initial Contribution plus Monthly charge**
Fixed charge contributed before the implementation of the project in addition to fixed monthly charges.
Site based on this system: Dongripada (20 HP), Nishet (15 HP), Tilse (20 HP)
- **Income based charges**
Farmer group contributes 10% of their income generated from the crops
Site based on this system: Tulyachapada (87.5 HP)

Ownership Transfer

Group takes all the main decisions for the pump including the schedule for operation for the farmers

With the help of local organization, group is involved in sale of farm produce and resolve the dispute in group



CASE STUDIES

Tulyachapada

	Before 2019	2019	2020
Type of Pump	Diesel	Solar	Solar
Type of irrigation	Flood Irrigation	Drip Irrigation	Drip Irrigation
Farmers: Number, Groups, Land for Cultivation	11 to 12	98	108 , 10, 1-acre
Cultivated Area & Period	6-7 acres	37 acres	55 acres, 95 to 100 days annually
Crops	Groundnut	Groundnut	Groundnut, onion, Garlic, Lond bean

Technical Set-up

- 10 solar pumps are installed.
- 87.5 HP collective capacity
- Setup can help to irrigate up to 110 acres

Tulyachapada



Ambyachapada

- 2014 --> 2 farmers cultivated 0.5 acres land using 90-95 liters of diesel
- 2015 --> Area increased from 0.5 acres to 1.5 acres using 190 liters of diesel
- 2016 --> Installation of Solar water pumping system- The number of farmers increased from 2 to 6 with an increase in area from 1.5 acres to 4.4 acres. Type of irrigation shifted from flood irrigation to drip irrigation.
- 2017 --> Increase in cultivation area from 4.5 acres to 6 acres
- 2018 --> 7 acres of land after monsoon months with minimum usage of diesel.

Projects

Valhaipada

Installed in May 2018

Number of groups: 2

Number of Farmers: 14

Installed Capacity: 6 HP

Major crops grown: Chilli



Ambyachapada

Installed in April 2016

Number of groups: 1

Number of Farmers: 6

Installed Capacity: 3 HP

Major crops grown: Okra, Beans, Groundnut

Projects

Saritkhel

Installed in July 2017

Number of groups: 6

Number of Farmers: 50

Installed Capacity: 30 HP

Major crops grown: watermelon, cucumber, pumpkin



Wada Cluster, India

Installed in March 2020

Number of groups: 13

Number of Farmers: 145

Installed Capacity: 120 HP

Major crops grown: Bitter Gourd, Okra, Cucumber

IMPACT

Based on independent reviews

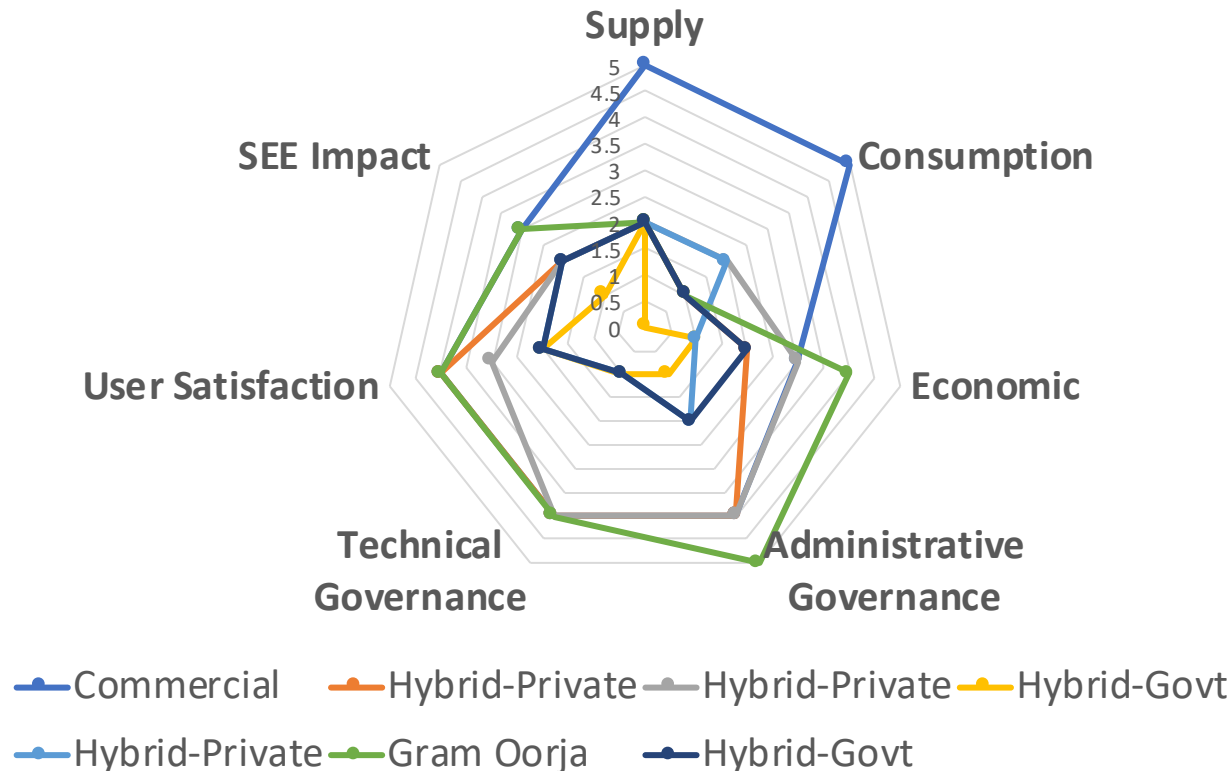


Long-term sustainability and impact of Solar water pumps

- Reduction in migration
- Reduction in use of diesel
- Cash crops are more economically viable
- Once the farmers earn income from farming, they can increase the farming area along with the system capacity by themselves
- Helps in food security
- It helps to reduce poverty and malnutrition (as they grow vegetables in a small area for their family)
- Generation of skill among the stakeholders for maintenance of irrigation system
- Women Empowerment in remote areas

Multidimensional sustainability and impact of solar micro-grids

Based on a study by Dr. A. Katre, University of Minnesota Duluth



Breadth and depth of Community participation in solar micro-grids

Based on a study by Dr. A. Katre, University of Minnesota Duluth



Commercial Hybrid-Private Hybrid-Private Hybrid-Govt
Hybrid-Private Gram Oorja Hybrid-Govt

Conclusions

- Plentiful opportunity in remote areas across many countries to replicate, scale and create larger impact
- Interventions with the initial 500 odd farmers addresses concerns on farmers' ability to pay
- Boundary conditions
 - Surface water on which the community has rights
 - Ability to come together in groups
 - Readiness to work for a second or third crop
- Explore partnerships to support development of agriculture supply chains and the local value addition to crops

Tribal Culture and Local Traditions



THANK YOU

www.gramoorja.in
office@gramoorja.in