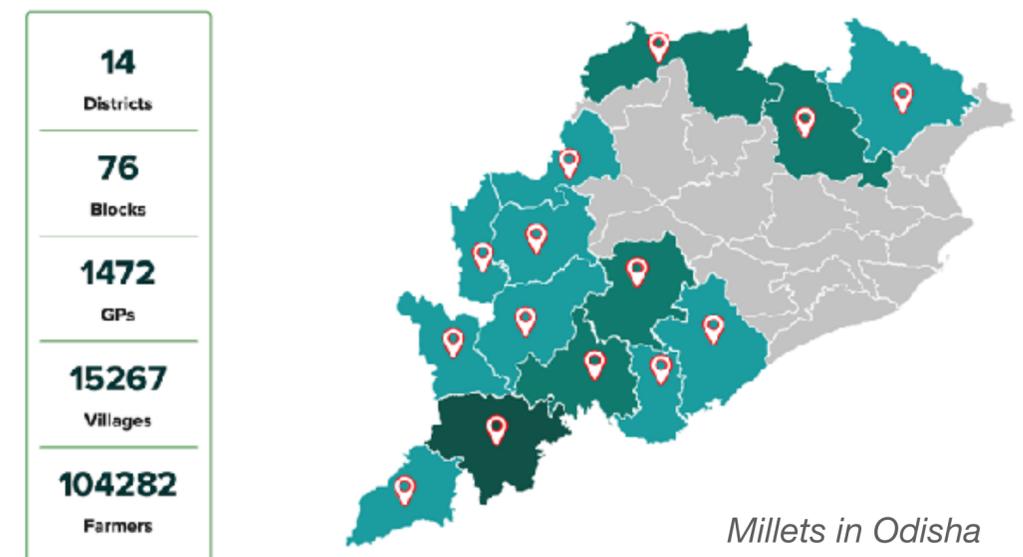


Climate change and development opportunity in Millets

- Nutritional and food security
- Immensely water efficient
- Resilient to climate vulnerabilities and droughts
- Can be cultivated in rain-fed regions (+ efficient irrigation)
- Flourishes in harsh soils and with low or no external input
- Potential for fodder (sorghum and pearl millet) - fresh or dry support 5 heads of livestock
- Value addition and increasing demand (due to health benefits)
- India leads in Global Millet consumption followed by Nigeria and Burkina Faso
- 300 million+ people live on millet based livelihoods in India
- Grown extensively in rural Tribal areas of **Odisha, Andhra Pradesh, Karnataka and Tamil Nadu**
- **Odisha Millets Mission (OMM)** also known as the Special Programme for Promotion of Millets in Tribal Areas of Odisha was launched by the Government of Odisha in 2017 to revive millets in farms and on plates. The model template is used to replicate in multiple states and as at nation level over the next 5 years.



A farmer displays Finger Millet growing on her farm (Photo by Sahaja Samruddha)



Role of energy in the Millets Value chains and gaps (Problem Statement)

| Nodal Points | Inputs | Production | Collection | Processing | Wholesale | Consumer |
|---|---|---|--|--|---|-------------------------------|
| Stakeholders | Seed,Fertilizer | Individual Farmers Farmers with Cooperatives Farmers with FPOs Farmers link to SHGs Farmers with enterprises/start up | Middlemen(Local or Outsider) Wholesaler Retailer and Shopkeeper Mill owner Private Enterprises TDCC | Individual Enterprise FPO/SHG Private miller Enterprises Breweries | Wholesaler Retailers Large Millers Micro entrepreneurs Grocery stores and Malls | Farmers HHs |
| Activities | Seeding-Seed treatment Land preparation- Ploughing,Fertilizer,weeding Life saving ,Irrigation | Planting Water management Nutrition management Crop management and protection Harvest Drying and Winnowing | Collection drying Selling Transport Storage Quality testing Trading | Washing Cleaning Drying Milling Packaging Value addition Transportation | Sale and Value addition | |
| Opportunity for Energy efficient, Sustainable Energy driven Technologies | Water pumps (1 0.5 hp every 20 acres) Graders and blowers Nursery - efficient greenhouse | Weeder Thresher (Seed production) Winnower Grader Dehusking (Large millet) Packaging materials | Weighing Machine Grader Fumigation Moisture Meter Storage (BE) | Dryer Destoner Aspirator Grader Hulling Polishing Flour Mill Mixing machine Baking unit Other value machines for vermicelli, pasta, papad etc Fodder making | | Millet specific mixers |

Case 1: Sittlingi Organic Farmer Producer Group, Solar Millet Processing Unit

- SOFA, promoted by THI needed value added processing centre for meeting market demand of millet based biscuits, health mixes, etc.
- At the time the project started, SOFA had 300 member farmers with an annual turnover of INR 3,50,000 (\$ 4200).
- A 4.5kWp solar system has been installed to power the processing machines that have motors ranging from 0.5-2 HP. The system is designed to provide 4.5-5 hours of back-up and can run a combination of machines of 4 HP at a time. The machines connected to the system include a flour mill, grader/de-stoner, weighing machine and packing machine. The total cost of the solution was INR 590,000 (\$ 9100).
- They received a sum of INR 200,000 (\$ 2745) as a loan. The rest of the amount was borne by SELCO Foundation as the Research and Development cost.
- Today SOFA has an annual turnover of INR 25,00,000 + (\$ 29,400) and over 700 members.



Settling Organic Farmer Producer Group, 4.5 kw Solar energy system - SVAD

Case 1: Bhoomika Farmer Producer Company, Solar Millet Processing Unit

- Much of the agricultural output in Ranebendur is dependent on the southwest monsoon and hence face extremely challenging conditions.
- Vanasiri Rural Development Society (VRDS) was started in 2003 promoted Bhoomika Farmers Producers company with support from NABARD, it has 475 shareholders with share capital of INR 4,30,000 (\$ 5900)
- Bhoomika FPO now has 3 different machines which are used for destoning, grading and dehulling of millets. Combined with solar solution of 3 hours + hybrid option has been provided where machines are utilized one at a time. The solar system consists of 2.5 Kw panels and a 5 KVa Invertor systems.
- Bhoomika received a loan of INR 2,50,000 (\$ 3432) from NABARD for a period of 3 years. The early stage of the FPO was a barrier in accessing the entire amount.



Bhoomika Farmer Producer Company, 2.5 kw Solar energy hybrid system - Rural Mart

SELCO Foundations Approach to Energy+Millets nexus

Create enabling conditions for adoption and scale of SDG 7 driven millet value chains there by improving resilience, sustainability, reduction of drudgery and improving farm and allied incomes.

Build appropriate SDG 7 innovations across the value chain with **millet experts and partners.**

Technology:

- Work closely with technology vendors and clean energy enterprises for them to be able to offer energy efficient and solar driven millet value chain solutions to local end users and businesses.
- Develop training and capacity building modules for technology providers and for clean energy enterprises to be able to sell and service efficient solar integrated solutions.
- Partner with technology RnD stakeholders working on millet technologies/ solutions to incorporate energy efficiency within their work.

Ownership and financial:

- Work closely with community based organisations, private millet businesses, farmer producer groups, SHGs etc to develop all options for ownership and unlocking finance for pre-harvest, harvest and post harvest SDG 7 driven solutions.
- Develop training and capacity building for business planning and financing for SDG 7 driven millet value chain solutions for FPOs/ SHGs/ Individual enterprises and financial institutes/ bankers.

Markets (inputs and outputs):

- Capture learnings and transfer learnings from experts, government departments and CBOs on channels for sales, product diversification best practices for inputs and outputs etc.
- Identify and closely work with champions that can train farmer groups etc on potential market linkages and leveraging market options and opportunities for harvest and value added products.

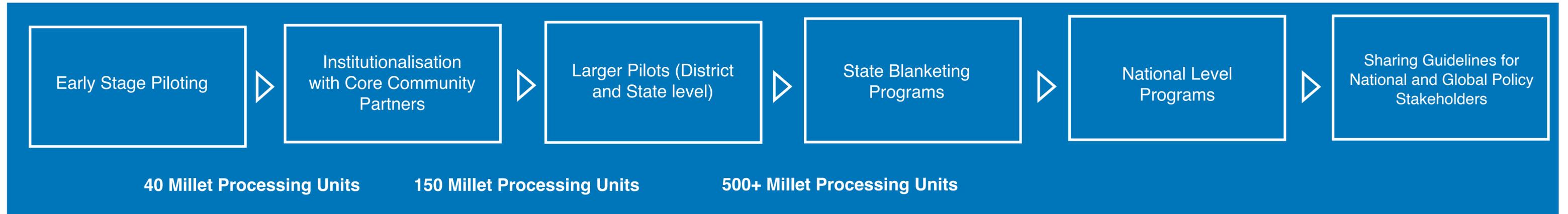
Policy

- Converge, leverage and institutionalise SDG 7 with relevant government institutions for technology, financing, inputs and marketing and training of millet value chains.

Example of state level ecosystem partners

| NGO Partners | Technology Partner | Research Institutions | Knowledge centre- Workshop and Exhibition | Scope of Financial Institutions | Private enterprises/ companies | Government Departments |
|---|---|--|--|--|-----------------------------------|---|
| WASSAN Harsha Trust PRADAN Nirman Pragati Koraput CYSD DAPTA Jan Sahajya SVA Dhan foundation LAVS MSSRF KFA ASHA | Hindustan Machines (Koput - millet thresher) AK Enterprises (Cuttack - flour mill, de-stoner, grader, kneading) FA Trading (Cuttack - flour mill, de-stoner, grader, kneading) Bharat Machines (Cuttack and Bhubaneswar - flour mill, de-stoner, grader, kneading) | OUAT- Odisha university of Agricultural Technologies NCDS(WASSAN) IIMR Krishi Vigyan Kendra (KVK) | Krushi Odisha, an annual flagship five-day exhibition cum knowledge sharing event. It is happening at Janata Maidan of Bhubaneswar in every year of Jan month. Here more than 5000 farmers from across the state on a daily basis. | Samunnati NABKISAN Axis Bank Syndicate Bank SBI KCC | HighBee Pvt Ltd Samruddhi | Millet Mission ITDA OLM MDM ICDS PDS |

Progress Snapshot | Innovation - Institutionalisation - Replication



Sitlingi Organic Farmers Association
Bhoomika
 SG Foundation
 Seba Jagat

Vrutti
 Putanna District Agriculture Training Center
 Millet Machines Inc
 AK Enterprises
 Hindustan Machinery

Wassan IFHD
 Transform Rural India Foundation

Revitalizing Rainfed Agriculture Network
Odisha Millet Mission

Clean Energy Network (CLEAN)
 National Millet Mission
 National Rural Livelihood Mission
National Bank for Agriculture and Rural Development

SNV
 Precise
 FAO (Food and Agriculture Organization)
 IFAD (International Fund for Agriculture Development)
 UNIDO

