Scaling up the Reach of Processing Equipment

Concept, Efforts, Results and Learning

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Scaling up Small Millet Post-harvest and Nutritious Food Products Project
Context

• The hullers for small millets developed in the first phase need to be adopted by decentralised processing units along with other accompanying equipment to serve as a functioning unit.

• The market for the processing equipment is not yet established; it is a derived market that caters to the slowly emerging market for small millet foods.

• The decentralised units have to compete with large scale centralised processing units in meeting the demand for small millet rice in the urban areas.
## Context...

<table>
<thead>
<tr>
<th>Production ecosystem</th>
<th>Technology adoption ecosystem</th>
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<td>1. Small scale unregulated industry</td>
<td>a. Information on the technology has not reached widely,</td>
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<td>2. Only 4 small scale manufacturers in Southern India</td>
<td>particularly Central &amp; North India</td>
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<td>supplying based on orders</td>
<td>b. Lack of organised information and guidance for the new</td>
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<td>3. Product design was not standardised</td>
<td>entrants</td>
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<td>4. Improvised version of paddy processing machineries.</td>
<td>c. Lack of training support for processors</td>
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<td>5. Limited investment on promotion across India</td>
<td>d. Lack of service providers for addressing repairs and</td>
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<td>6. Inadequate institutional arrangements for long distance</td>
<td>maintenance</td>
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<td>sales</td>
<td></td>
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<td>7. Inadequate competition, poor research input, and lack</td>
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<td>of a system for enforcement of standards</td>
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- **Business incubation approach attempted**
- **Capacity building of the end users attempted**
Business model

1. Commercialisation business model for new equipment - Business incubation

   - Fabricators
     1. Victor
     2. AVM
     3. Perfura

   - Fine tuning of equipment with end users in mind

   - Government Schemes

   - NGO networks

Result expected:
To reach 200 end users who in turn serve 30000 persons

2. Knowledge transfer business model - Extension

   - Defunct dehulling units

   - Capacity building and support for revival

3. Comparison with other equipment manufacturers

1. Village level Millets (80%)
2. Small processors (15%)
3. Food Companies (5%)
Onsite business incubation support model

Product improvement

Improving visibility

Building business linkages

Equipment manufacturers

Increased reach and scale of operations across India

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Partnering with equipment manufacturers

The following equipment manufactures were identified and MoU was signed with them:

1. AVM Engineering Industries, Salem
2. VICTOR AGRO SALES, Salem
3. Perfura Technologies (India) Pvt. Ltd, Coimbatore
4. AGROMECH ENGINEERS, Coimbatore
5. KMS Industries, Coimbatore
6. Vishwa Agro Tech & Bio-Tech, Mysore
Product improvement support

- Products of six manufacturers were assessed
- Exposure to design standards and practices for grain processing equipment that are followed by leading equipment manufacturers
- Joint R&D involving technology developers (research institutions), technology adopters (manufacturers) and end users (processors)
- Technology transfer

Results

- Capacity of manufacturers on design improved
- Design modifications were made
Huller improvement made by AVM

- **Foot print, weight and height reduced** - women friendly
- **Safety improved** - reducing the space between moving parts and the outer guard, and by introducing an emergency switch
- **Stability improved** - reducing the overhang load on the pillow block
- **Flexibility improved** - Two motors used, power saved
- **Panel board added** - to make the unit as plug and play
Improvements made by AVM
Improvements made by AVM ...

Double chamber huller for kodo millet & medium scale -500 kg/hr huller developed and marketed
Huller Improvement by VICTOR AGRO SALES

- **Outflow channel widened** from hulling chamber for smooth flow of hulled materials
- **Damper reintroduced** in aspirator blower of dehuller
- **Stability improved** by reducing overhang load on the pillow block
- **Safety improved** by adding an outer guard for moving parts
- **Impeller rotation** made smoother, thereby reducing energy consumption
- **Hulling quality improved** by sticking rubber on one side of the impeller dome
Improvements by VICTOR AGRO SALES
• Medium scale huller prototype with capacity of 300kg/hour; double chamber huller-100kg/hr & small scale-30kg/hr
• Developed prototype based on Otake huller

Destoner
• Divider introduced for better segregation of output
• Performance improved by changing the bed mesh hole size
Improvements by Perfura Technologies Pvt. Ltd.

HULLER
• Rolling out double chamber centrifugal huller developed by TNAU

PORTABLE GRADER
• New design grader with aspirator on wheels
Some improvements by Agromech Engineers

Huller

- Huller of 60-80 kg/hr developed
- Aspirator design was changed to reduce the mixing of husk with rice output
- In hopper, a grain level indicator was added
- Motor was mounted between the aspirator and the hulling chamber, reducing the overall height of the machine

Grader

- Development of interchangeable sieve grader

Destoner

- A sliding door was provided to facilitate ease of cleaning the covered base
Improvements by Perfura Technologies Pvt. Ltd.

Grader
• With interchangeable sieves

Destoner
• Motor box size increased; grain flow inflector was introduced

Improvements by Vishwa Agrotech & Biotech

Grader
• 3 deck interchangeable grader with slope adjustment mechanism
Improving visibility

- Website creation - facilitated for AVM & Victor
- DHAN weblink - profile of manufacturers uploaded
- Newspaper Advertisement in unrepresented regions - AVM & Victor
- Google advt. - Victor
- Flyer with details of processing equipment offered by 5 manufacturers shared via mail & in exhibitions
Building business linkages

Support for participating in Expos

• Perfura
  – MADDISSIA Food Tech -2017
  – Organics & Millets 2018

• VICTOR AGRO SALES
  – Tamil Nadu Agriexpo -2016, Madurai
  – Grain Tech-2017
  – World Food India-2017, Delhi
  – CODDISIA-2017, Coimbatore

• KMS
  – CODDISIA-2017, Coimbatore
Building business linkages...

• Linking fabricators with potential buyers by sharing leads
• Helped fabricators to reach uncharted areas in Uttarakhand, Madhya Pradesh, Karnataka, Odisha, Kerala, Maharashtra, Chhattisgarh, Rajasthan, Sikkim etc. by using contacts with NGOs, FPOs and individuals working in this field.
Building linkages with Government

• Linking AVM and Perfura with ‘Comprehensive Revival of Millets in the Farming Systems and in Household Consumption Project’ of Andhra Pradesh Government

• Linking Perfura with Tamil Nadu Innovation Initiatives Project by TNAU

• AVM and Victor listed by Karnataka Government
Perfura Technologies Private Ltd and VICTOR AGRO SALES shared about their products and AVM, Agromech and KMS Industries participated in “EMERGING TRENDS IN PROCESSING & VALUE ADDITION OF SMALL MILLETS, Madurai under the aegis of ‘Madurai Symposium’ and interacted with national level delegates on small millets
Supporting existing small millet processing units

• Protocol was developed to study the existing community level SMPUs

Issues
• Improper machines and improper handling
• Lack of requisite machines, power problem, and manpower problem
Revival of SMPUs- Efforts taken

- Exposure to successful units
- Support for infrastructure
- Skill building

Defunct/ sub-optimally functioning SMPUs

Revival/ Improved quality of output and improved performance

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Skill building & Exposure

Training at Salem, Tamil Nadu

Training at Koraput, Odisha

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Support for infrastructure

Fitting destoner at Pudur Nadu

Revival of machine at Kundali

Revival of machine at Peraiyur

Revival of machine at Mangalrevu

Revival of huller at Pudur Nadu

Revival of FPO’s machine at Semiliguda

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Results

• 5 units revived in Odisha & 16 in Tamil Nadu

Learning

• Each unit has a different set of problems and needs specific efforts for revival
• Modalities for supporting setting up of village level custom hiring processing unit evolved
• Modalities for supporting setting up of regional level processing unit evolved
Capacity building of end users for sustained adoption

End users:
- Prospective buyers
- Promoters
- SMPUs

Orientation and providing key information

Demonstration of equipment

Connecting to manufacturers

Facilitating purchase and installation

Skill building and on-going support to operators

Training to mechanics

Adoption of technology

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Demonstration

• **In strategic locations**
  4 in Odisha, 3 in Tamil Nadu, 2 in Andhra Pradesh and 1 in Uttarakhand

• **Key organisations**
  Odisha- Sabala, Living Farms, and Nirman
  Chhattisgarh- Nirmaan
  Rajasthan- Banyan Tree
  Maharashtra- MAVIM
  Uttarakhand- INHERE

• **Demonstrating in the key events**
  Madurai Symposium 2017 & Exhibitions
Supporting the new entrants

• A guidance note covering the following is shared to potential buyers:
  • Purchasing machines based on scale
  • Testing the machine at the manufacturer site
  • Layout
  • Installation
  • Post-installation testing

• Exposure visit to running SMPUs and products offered by different manufacturers organised

• Potential buyers & new entrants joined in Facebook & WhatsApp groups (SM groups)
Capacity building
Total trainings-15
Total number of participants-345 (women: 59 and Men: 286)
NGOs supported-46; Government/Department-33
New Players-175; FPOs-30
SMPUs-61

Training to Mechanics
Training was imparted to mechanics from Tamil Nadu & Odisha at Victor Agro Sales’s workshop in Salem

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Improvement in performance of EMs

• Increased ability of AVM, Victor, and Perfura to serve distant markets beyond Southern India
• Positioning as providers of appropriate small millet processing equipment throughout India
• Increased ability of AVM and Perfura to liaise with government entities involved in procurement
• Widening of contact base and reach of all manufacturers
• Increase in production capacity by AVM
• 164 new units & 21 old units reached out of target of 200 units
• 52 districts in 10 states covered
Gender outcomes

• Drudgery reduction in the places where custom hiring centers were established
• Gender friendly/neutral machines
• Machines with better safety
Overall learning

- Incubation approach was found to be suitable for improving small scale Ems
- But performance of EMs limited by internal and external factors
  - On the internal side: Inadequate ability
    - to invest in significant modifications in the design of their equipment
    - to enhance their production capacity, to market their products in distant markets and to invest in capacity building of manpower
    - There is need to support access to capital at convenient terms
  - On the external side:
    - Limited by the slow growth of the demand for processing equipment, entry barriers pertaining to large-scale government bids, and a lack of support to meet R&D costs and for improvement of production capacity
Overall learning...

Facilitating adoption:

• More focused investment is needed on developing the utilisation ecosystems in these regions through:
  (i) Local demonstration of SMPU
  (ii) Capacity building on equipment operations
  (iii) Facilitating access to quality equipment, and
  (iv) Building local cadre of mechanics
to bring about a bigger change
Scope for scaling up the learning to make larger impact

• There is large scope for scaling up the learning from the project
• The incubator approach to improve production ecosystem can be replicated in Central and North India
• The working model to facilitate adoption can be replicated in major production regions
• Focused long term efforts and investment needed to bring about viable decentralised processing infrastructure across India
• Can be replicated in other countries in Asia & Africa