

Building innovation adoption capacity of rural communities

S Sai Mohan, Asmita Moon, M Chandrasekhara Rao and Ravindra Adusumilli

Sustainable mechanization for smallholders is not merely about machines—it is about building local capacity, enterprise and trust. Innovation Guild's ecosystem model shows that with the right partnerships, technology can truly take root in rural India.

Demonstration of paddy transplanter



In India, more than 90% of farmers depend on agriculture as their main source of income and 70% of the farming community owns small and marginal land holdings. Despite the significant size of the domestic market, existing machinery is unable to cater to the specific needs of small and marginal farmers. In spite of several innovations, they don't go beyond internet videos and pilot projects. With the limited production and distribution channels, it becomes logically and financially tough for farmers to access and use these machines and tools.

Some of the factors responsible for lack of technology adoption include:

- Limited awareness regarding emerging tools and ideas that could benefit their specific crops or conditions.
- Most machines being designed are available as "standard products," while every village and farm is different in its soil, crops, terrain, or practices.
- Absence of standard operating procedures (SOPs) and inadequate reliable maintenance services.
- Lack of trained technicians and infrastructure for timely repairs and maintenance.
- Farmers have low trust on investing in unfamiliar machines.

To bridge the gap between innovations and smallholder farmers and enhance technology adoption by farming communities, Innovation Guild has fostered an extensive localized network of skilled Village Level Entrepreneurs. Village Level Entrepreneurs (VLEs) are the vital link in the rural innovation chain. These VLEs are those who understand the realities of local farming situations and hence can guide farming communities in the use of technology. By preparing a cadre of VLE's with the right skills, tools, and partnerships, a 'critical mass' of a reliable and supportive human resources can be built in villages.

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Innovation Guild's ecosystem systematic approach

Innovation Guild has built a step-by-step approach for implementation which has yielded positive results.

1. Community engagement and VLE identification

To connect new ideas to the rural communities, the community itself is regarded as the starting point. This requires two key partnerships. a) Innovation Guild partners with organizations who have a strong ground presence and have a deep understanding of local livelihoods, provide information on regional technology gaps, and identify potential Village Level Entrepreneurs. These could be in the form of Self Help Groups (SHGs), Farmer Producer Organizations (FPOs), or even their own branches. b) Village Level Entrepreneurs (VLE's) are the local resources, who are technically sound and are interested in setting up a local enterprise. These include local mechanics, electricians, plumbers, ITI graduates etc.

2. Technology gap identification

Meetings are conducted with ground partners and their identified farmer groups to build trust. This is done through direct meetings and field visits. This is followed by Technology Gap exercises. During this process, tools currently being used and gaps in design, capacity, raw material and energy source compatibility etc., are identified.

3. Technology mapping

Once the local needs are clear, requirements are mapped during technology meetings. Willing innovators are



15/10/2024 14:57

identified. Firstly, existing innovations are scouted and assessed for local adaptability. If needed, wider market is examined for tested, grassroots-aligned solutions. To bridge the gap between innovations and farmers virtual demonstration days, are organised, where VLEs see new tools in action.

4. Building VLE Business models

VLE's are considered as extended arms on the ground. Based on the VLE's interest and skills, they decide how they would like to earn from the selected machine - a) becoming the local expert to sell and distribute new, tested technologies; b) offering reliable, local service for the machines across villages. c) providing custom hiring service to small farmers by owning and renting out specialized machines. d) assembling or fabricating small, customized farming tools locally to meet specific village needs. They are then guided in preparing business models in the areas of their interest.

5. Support to VLEs

The VLEs, like any other entrepreneurs, need ecosystem support to build their enterprises.

a) Capacity Building: Innovation Guild provides access to comprehensive, need-based training. This starts with essential foundational skills, such as workshop tools, basic welding and safety measures, often conducted in collaboration with certified ITI training institutes. To ensure practical readiness, intensive, hands-on programs are organized. For instance, a 5-day specialized training focusing on the complete Repair and Maintenance of agricultural machinery, including the power weeder, brush cutter, and oil engines, was conducted at the Southern Region Farm Machinery Training and Testing Institute (SRFMT&TI) in Anantapur.

b) Access to innovators: The VLEs who are investing in heavy machinery need to ensure its compatibility



Field trial of battery weeder by Innovator – VLE collaboration

in their regions. Through ground partners, Innovation Guild facilitates feedback from ground to the innovators to make the necessary changes. As VLEs progress in their business, Innovation Guild ensures direct accessibility to the innovators for VLEs to build inventory or even start business with new products.

c) Access to tools and platforms required for business: Each VLE prepares a business plan. To track their progress, the Guild offers a Cost Economics Calculator - a simple tool that helps VLEs estimate daily costs, set fair service prices, and identify breakeven points for every machine they operate.

d) Access to financing institutions: Higher investments are required for high-end machinery. To facilitate decision making, the available options - like subsidies or financing from FPCs at lower interest rates is studied. Then, partnerships are built with financial institutions so that VLEs can have access to multiple financing options without additional costs on them or ground partners.

Together, all these steps create a cycle where innovation, enterprise, and feedback reinforce each other.

Table 1: Few Illustrative Cases

Shaik Baji (Telangana) - Manual Tool Sales	Addressed labor-intensive weeding and cotton sowing for women farmers. Partnering with small tool innovators, he sold 23 low-cost tools from blade weeders to solar pest traps, earning ₹4,440 in profit while promoting efficient, ergonomic farming practices.
Kuda Venkatesh (Andhra Pradesh) - Rural Repair Services	Established a local farm machinery repair unit, servicing oil engines, processing machines, and power weeders. In one season, he earned ₹26,600, cutting farmers' downtime and building a dependable local service ecosystem.
Maa Kamala FPC (Odisha) – Mechanizing Tamarind Processing	Introduced a tamarind deseeding machine, raising output from 100 to 360 kg/day and cutting labour costs by 84%, empowering women SHGs to manage and rent out the unit.
Peraiah (Tirupati, Andhra Pradesh) – Bed-Making Machine Rentals	Provided custom-hiring services for tomato cultivation across 10 villages, covering 35 acres and earning ₹38,700 in one season.
Sheela Didi (Madhya Pradesh) – Single Wheel Weeder	Reduced weeding time from five days to 8–10 hours per acre, covering 30 acres in a month and easing women's drudgery.
Participatory modification of Ginger Harvester (Araku, Andhra Pradesh)	Farmers and VLEs jointly redesigned a bullock-drawn ginger harvester, transforming a non-functional prototype into a terrain-suitable, labour-saving tool.
Pepper Thresher Entrepreneurs (Araku & Paderu)	Introduced mechanical threshers that reduced processing costs by 97.5%, improving efficiency while ensuring local repair and maintenance support.
	...and many more

Impact on the ground

The Innovation Guild approach has successfully established a resilient, community-centric ecosystem that directly connects rural areas with tailored innovation. A network of 250+ VLEs with 7 ground partners across Andhra Pradesh, Karnataka, Telangana, Maharashtra, Odisha, Madhya Pradesh, Uttar Pradesh and Himachal Pradesh have been established. We have 81 active VLEs mapped with technologies from a pool of 40 plus innovators. About 50 of these VLEs have gone through either of the 5 comprehensive training programs conducted by Innovation Guild.

VLEs run sustainable businesses by ensuring regular repair and maintenance, operational support, and custom hiring services of machinery, accelerating the technology adoption while bringing employment to local youth. Some of the cases are illustrated in Table 1.

Way Forward: Sustaining Growth through Collaborations

Given the challenges and resources required for accelerating the technology adoption, we believe, collaboration is the way ahead. Moving ahead, Innovation Guild seeks collaboration with CSO's and innovators across India to tailor technology solutions. We look

forward to collaborating with partners to strengthen the ecosystem for innovators and the VLEs.

References:

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S Sai Mohan

Project Coordinator (Innovation Guild)

WASSAN (Watershed Support Services and Activities Network)

Plot No. 685 and 686, Street No. 12,
Lakshmi Narasimha Colony, Mallikarjun Hills,
Nagole, Hyderabad,
Telangana 500068.

E-mail: saimohan@wassan.org