

Enhancing Indigenous Rice Varieties and Market Access in Maharashtra, India

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Multifunctional Landscapes Program

Multifunctional Landscapes is a CGIAR Science Program that aims to enhance the resilience, productivity, and sustainability of agricultural landscapes by integrating diverse land uses, ecosystem services, and livelihood strategies. The initiative supports evidence-based policies and innovations that balance food production with climate adaptation, biodiversity conservation, and social inclusion. By working with local communities, governments, and partners, it promotes landscape-level approaches to managing natural resources for long-term ecological and economic benefits.

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Key Messages

- Indigenous crops like Kalbhat are deeply rooted in tradition, nutritionally rich, and adapted to local agroecological conditions, yet remain under-supported in mainstream agricultural policy and markets.
- Diversification through indigenous crops can improve food sovereignty, stabilize incomes, and enhance climate resilience.
- Market access, infrastructure limitations, and generational shifts in labor are significant barriers to the viability of traditional crop systems by smallholder farmers.
- Strengthening value chains, promoting farmer cooperatives and Farmer Producer Organization (FPOs), and supporting youth in sustainable agri-enterprise and linking to local tourism can contribute to unlocking the potential of indigenous crops for better livelihoods in a saturated market such as rice.
- Community-based practices such as seed banks, traditional processing, and circular reuse of by-products demonstrate the sustainability potential of indigenous rice varieties.
- Consumer preferences have historically posed a barrier to the adoption of indigenous varieties; however, a notable shift is underway. Households are increasingly choosing indigenous crops again, primarily due to their higher nutritional value, indicating a positive reversal in consumer trends that policy can support and amplify.

Context

India boasts a rich diversity of indigenous rice varieties, each with unique characteristics and culinary uses. In Maharashtra's Akole Tehsil, Ahmednagar District, local communities have retained traditional agricultural systems cultivating landraces of rice, finger millet, pulses, and vegetables. These crops contribute not only to nutritional and ecological health but also hold significant cultural value. Rice cultivation is a primary agricultural activity, with over ten distinct varieties identified as of 2024. Through participatory variety selection, farmers have identified several indigenous rice varieties that meet diverse preferences and needs. These varieties are crucial for household food security as staples and contribute surplus production for market sales and income generation.

Under the CGIAR's Nature-Positive Solutions initiative and now the Multifunctional Landscape Science Program, a Farmer Producer Organization (FPO) has been established to support the local rice value chain (Ghione et al., 2025). Central to this initiative is the installation of a pilot milling machine designed to process multiple rice varieties, addressing the critical processing and aggregation needs, particularly for small-scale producers. However, there is a critical need to develop sustainable value chains for indigenous rice varieties.

Participatory Focus Group Discussions (FGDs) were conducted in six tribal and semi-tribal villages to understand farmers' practices, constraints, and perspectives particularly focusing on Kalbhat rice variety. Kalbhat is a distinguished indigenous rice ecotype, valued for its unique flavor, cultural relevance, and potential health benefits, positioning it well for conservation and promotion under agrobiodiversity and nutrition-sensitive policies (Londhe et al, 2025). Farmers recognize its potential for market development. The findings provide a bottom-up roadmap for policy and investment to strengthen these value chains. The overarching objective is to create economic incentives for farmers by enhancing product differentiation, improving market access, and establishing sustainable value chains that benefit both the local economy and the agricultural community.



photo: BAIIF

Socio-ecological Setting of the Study Area

The study was conducted in six villages—Bari, Chichondi, Jahagirdarwadi, Murshet, Panjare, and Pendshet—characterized by hilly topography, tribal demographics (primarily Mahadev Koli and Thakar), and dependence on rain-fed agriculture. These areas receive between 600 mm and 3000 mm of rainfall annually and face challenges such as poor connectivity, market exclusion, and seasonal migration. Local economies revolve around the cultivation of cereals, millets, pulses, and vegetables, often using low-input, traditional methods. The six FGDs (one in each village) engaged more than 130 farmers, with women representing at least 40% of participants and reaching 50% in several sessions. Participants included elders with deep traditional knowledge and younger adults weighing the decision to stay in agriculture.

Crop and Varietal Diversity

Farming systems in the study area are characterized by rich crop portfolios that are diverse, spanning over 30 varieties across cereals, millets, pulses, oilseeds, and vegetables. This diversity provides resilience to climate shocks, nutrition for households, and flexibility in production. This is especially important in agriculture dependent communities where diversified farms provide food security and balance market and nutrition needs.

The most favored varieties were selected not only for their agronomic performance—such as drought tolerance, pest resistance, and suitability to low-input conditions—but also for their deep cultural relevance and economic value. Millets like finger millet, little millet, foxtail millet, and sorghum are valued for their role in traditional diets and seasonal rituals, while pulses such as lentils, green gram, and cow pea are integral to both daily meals and intercropping systems. Oilseeds like groundnut, sunflower, and sesame, as well as vegetables such as onion, potato, tomato, and bottle gourd, are widely grown for both home consumption and local market sale.

Rice production

Rice plays a central role in the agricultural systems of the study area, both as a staple food and a cultural cornerstone. Farmers cultivate a mix of improved and traditional rice varieties, each selected based on agronomic traits, cultural relevance, and market demand. Traditional varieties often carry unique sensory attributes, medicinal properties, and are deeply embedded in ritual practices. Improved varieties tend to be favored for yield and shorter growing cycles.



photo: Alliance Bioversity International and CIAT

Table 1. Main rice varieties identified in Akole Tehsil, Ahmednagar District

Ranking of variety total area	Rice variety name	Description
1	Indrayani	Popular improved variety with good cooking quality; highest acreage
2	Akshat	New hybrid variety, high-yielding favored for short-duration growth
3	Daftari 125	Improved variety
4	Dhavul	Locally adapted traditional variety, grown on small scale
5	Gari kolpi	Niche traditional variety; limited cultivation
6	Om Shriram	High-quality hybrid with market appeal
7	1008	Improved, high-yielding variety; grown mainly in Chichondi
8	Sundari	Medium-duration variety used in local diets
9	Kalbhat	Medicinal, culturally revered; consistently grown across sites despite small acreage
10	Jaya	Stable yield; favored for its resilience
11	Masuri	Aromatic fine grain; occasionally grown for household use
12	Ghansal	Long-grain traditional variety, cultivated in Panjare
13	Manor	Short-duration, low-input variety

A total of 13 rice varieties were recorded during FGDs (Table 1). Although the area under cultivation is generally limited, cumulative area for some varieties reaches up to 259 hectares (Table 2). Indrayani is the dominant variety, accounting for 45% of the total rice area in the project villages, followed by Akshat (Figure 1). Kalbhat, though ranking seventh in total area (13.8 ha) and comprising only 2% of the rice cultivation area, is consistently grown across villages, indicating sustained farmer interest. On average, each farmer cultivates 0.26 hectares of rice, often using multiple varieties on the same field. Improved varieties such as Indrayani and Akshat are widely grown due to their yield performance and shorter maturation cycles. On the other hand, traditional varieties like Kalbhat are valued for their unique taste, cultural significance, and medicinal uses. Some varieties like Gari Kolpi have limited but sustained cultivation, indicating their preservation for household use or local rituals.

Table 2. Rice varieties cultivated across six villages

Name of Rice Variety	Village name												Total	
	Bari		Chicondi		Jahagirdarwadi		Mushet		Panjare		Pendshet			
	NFC	Total area (Ha)	NFC	Total area (Ha)	NFC	Total area (Ha)	NFC	Total area (Ha)	NFC	Total area (Ha)	NFC	Total area (Ha)		
1 Indrayani	180	45	220	60	210	42	140	45	35	40	100	17	885	259
2 Akshat	120	30	80	16	20	3.5	120	35			110	14	450	98.5
3 Daftari 125	60	20	60	1	30	4	80						230	
4 Dhavul	100	30											100	30
5 Gari kolpi	15	10	15	4	5	1	5	0.4			25	10	65	25.4
6 Om Shriram	80	25											80	25
7 1008			125	25									125	25
8 Sundari					125	20	30	3					155	23
9 Kalbhat	7	1	15	3	15	2.5	4	0.3	4	6	7	1	52	13.8
10 Jaya									12	10			12	10
11 Masuri									28	10			28	10
12 Ghansal									18	6			18	6
13 Manor					30	2.5							30	2.5

Note: NFC: Number of farmers cultivating variety.

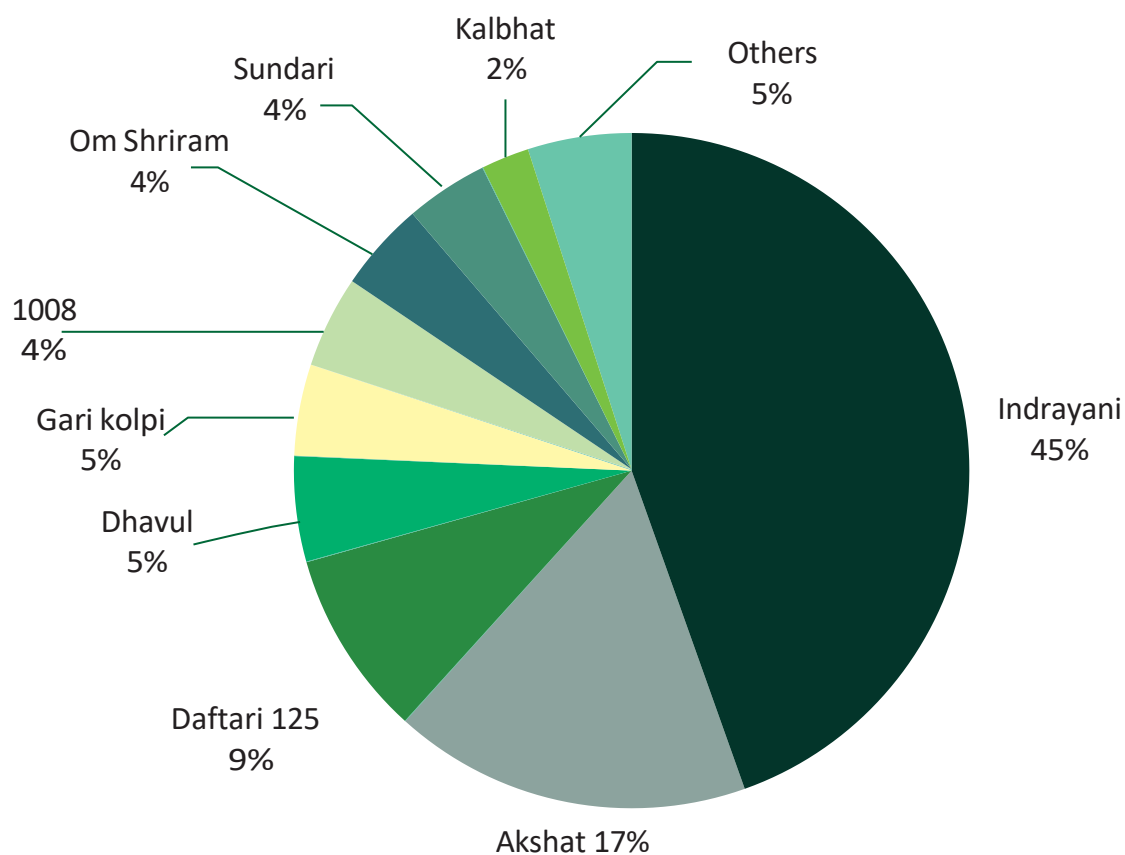


Figure 1. Area of production shares across all project villages

Kalbhat traditional knowledge and uses

Kalbhat is a traditional rice landrace distinguished by its black husk—its name deriving from “Kal” meaning black and “Bhat” meaning rice. Once milled, it reveals a white, long-slender grain known for its aromatic scent, slightly sticky texture, and reputed medicinal qualities. For centuries, Kalbhat has formed an integral part of the local diet, embodying both cultural heritage and ecological adaptation.

Cultivated mainly in dry upland areas with minimal external inputs, Kalbhat demonstrates natural drought tolerance and suitability for sustainable agriculture. With yields averaging 35–40 quintals per hectare, it is valued not only for resilience but also for its nutrient profile. Rich in iron, magnesium, and dietary fibre, it provides significant health benefits, particularly for children, expectant mothers, the elderly, and health-conscious consumers.

Kalbhat rice embodies centuries of cultural heritage and ecological adaptation. Deeply rooted in local traditions, it is celebrated in folk songs, featured in religious rituals, and revered as a “blessed grain” for its perceived medicinal properties. Elderly farmers recount its use in post-illness recovery and ceremonial feasts, particularly during wedding rituals and festivals such as Diwali and Makar Sankranti. Traditional dishes prepared with Kalbhat include “pej” (rice gruel for convalescence), “bhakri” (rice flatbread), and “pithla-bhat”, often consumed with local greens and pulses. These recipes not only highlight its distinct aroma and taste but also reinforce community identity and intergenerational knowledge sharing.

Processing remains community-based. Rice is hand-pounded using wooden mortars and sun-dried on bamboo mats—methods that preserve nutrients and lower the glycemic index. Even the by-products of this traditional processing are valued. Broken Kalbhat is used in infant porridges and snacks, while the husk is commonly mixed into cattle feed to aid digestion and improve milk quality, according to local dairy farmers.

This full-spectrum utility reflects the potential of Kalbhat and other endogenous rice varieties to contribute to circular rural economies. By minimizing agricultural waste and creating value from every part of the crop—from grain to husk—these traditional systems offer low-carbon, resource-efficient models of production and consumption. With appropriate support in processing and market development, such systems could scale into inclusive circular bioeconomy solutions, generating livelihoods while conserving agrobiodiversity and traditional knowledge.

Market Access and Pricing

Value Chain Structure:

Kalbhat moves through a fragmented value chain involving producers, aggregators (often local traders), and multiple market channels. Processing and packaging remain largely informal, limiting scalability and consistency in quality. Obtaining FSSAI (Food Safety and Standards Authority of India) certification would enable broader market access by ensuring compliance with food safety standards and building consumer trust.

Market Channels & Pricing

- **Local Markets:** Accessible but offer modest returns, with prices ranging from ₹50–80/kg.
- **Wholesalers:** suitable for bulk sales; prices range from ₹70–90/kg. However, producers have little influence of over price-setting.
- **Direct-to-Consumer (D2C):** Offers the highest margins (₹100–120/kg), typically accessed through urban organic stores or farmer groups selling via WhatsApp or local events. Logistically challenging but increasingly popular.
- **By-products:** Broken rice fetches ₹25–35/kg; husk is sold at ₹3–5/kg or used in-farm as fuel, composting material or as insulating material for walls and roofs—demonstrating potential for circular use.



photo: IWMI

Constraints

- **Recovery Rate:** Traditional hand-pounding yields ~60–65%, compared to 68–72% in mechanical mills, affecting profitability.
- **Middlemen dominance:** Local traders play a dominant role in price negotiation, often exploiting information asymmetries.
- **Low Bargaining Power:** Smallholders produce limited quantities and must sell immediately post-harvest due to lack of storage.
- **Transport & Storage:** Poor rural roads increase transportation costs and lack of warehousing leads to distress sales.
- **Information Gaps:** Farmers often lack real-time price updates, weakening their market position.

Youth Engagement

While many rural youths view agriculture as unviable—citing low incomes, limited infrastructure, and aspirations for urban employment—there is growing interest among some in modernizing traditional systems. Young farmers are increasingly drawn to opportunities such as:

- Obtaining organic certification and developing branded local rice products.
- Engaging in small-scale agro-processing (e.g., making rice-based snacks and flour).
- Leveraging digital tools for marketing and logistics.

With supportive policies and capacity building, this emerging interest and latent energy could be harnessed to position youth as key actors and stewards of agrobiodiversity and rural innovation.

External Support and Opportunities for indigenous rice varieties

Non-governmental organizations (NGOs) have been instrumental in conserving traditional rice varieties like Kalbhat. BAIF Development Research Foundation, an NGO based in Pune and main implementing partner of Nature+ Initiative of the CGIAR and now the Multifunctional Landscape Research Program, has played a crucial role in conserving and promoting Kalbhat rice. Their support includes seed banks, on-farm varieties trials, farmer training on sustainable agricultural practices, education on nutritional and health benefits, and market linkages, including the creation of an umbrella brand called Farming Monk. However, state-level backing still remains limited. Traditional crops are largely excluded from mainstream agricultural extension programs and procurement schemes.

Opportunities for Indigenous Rice Varieties:

- Integration into **public nutrition schemes**

such as school mid-day meals to enhance dietary diversity.

- Promotion through **agri-tourism, eco-labels and FSSAI certification** to boost consumer trust and market visibility.
- Inclusion in **agroecological transition frameworks** including India's National Mission on Natural Farming).
- Linkages with **urban organic markets and online retail platforms**, expanding reach and income potential for smallholders.

Recommendations

Enhancing the viability and conservation of traditional rice varieties like Kalbhat requires a coordinated strategy that simultaneously improves market access, strengthens local value chains, engages youth, supports biodiversity, and enables institutional backing (Puneeth et al., 2024).

Key actions include:

- **Infrastructure and post-harvest investment:** Upgrade rural transport networks and invest in decentralized storage, drying, and milling facilities to reduce post-harvest losses and improve farmer bargaining power.
- **Market development:** Strengthen farmer collectives and introduce branding, grading, and certification systems to enhance marketability and value addition. High potential for tourism in the region and developing direct sales as niche product (already adopted by few farmers)
- **Youth engagement:** Promote rural entrepreneurship through targeted grants, training in digital marketing and processing, and the creation of rural innovation incubators linked to universities and innovation hubs.
- **Agrobiodiversity and traditional knowledge conservation:** To preserve agrobiodiversity and traditional knowledge, policies should promote community seed banks, farmer-to-farmer learning, and the documentation of ethnobotanical practices, while offering incentives for conservation efforts.
- **Circular bioeconomy integration:** Promote value-added use of rice by-products—such as rice husk in compost, biochar or fuel recovery—to foster circular bioeconomy models that reduce waste and create additional rural income streams.
- **Policy integration:** Incorporate traditional crops into agricultural extension schemes, launch a dedicated agrobiodiversity mission, and integrate local varieties into public procurement programs for the policy push needed to scale impact and ensure long term sustainability.

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