

Enhancing Climate Resilience through Heirloom Seeds and Local Knowledge: A Policy Imperative for Small-Scale Farmers and Seed Keeper Networks in India

Small-scale farmers and seed keeper networks in India believe that heirloom and native seed varieties could enable them to withstand extreme weather events and other environmental/livelihood uncertainties. Local knowledge systems and culturally rooted sharing arrangements embedded with judicious use and management of native seeds are critical drivers for climate resilience. However, the dominance of mono-cropping and commercial seed markets has disrupted these traditional communal arrangements, eroding the seed sovereignty of marginalised farming communities. With severe resource degradation, climate change and poor farm productivity, there has been recognition to collectivise and organise native seed keepers to address these critical issues in the face of an evolving global environmental catastrophe. This policy paper evolved from the participatory action research (PAR) conducted with farmers and allied stakeholders in a village near Erode, Tamil Nadu.

a) Impact of climate change on everyday lives

Farming practices rely on the ability to predict seasonal changes. However, the growing unpredictability in emerging complexities associated with climate change has raised significant concerns among agricultural communities. To truly grasp how climate change affects our daily lives, we must shift our focus from immediate, visible changes to a broader, systemic perspective that considers the entire social-ecological system. Agriculture, as one such occupation not solely driven by profit maximisation, necessitates the preservation of heirloom seeds until substantial shifts in consumer behavior occur.

Projections indicate that by 2035, many regions will face severe water stress, causing the depletion of traditional water sources. Untimely rains have led to weed proliferation, significantly increasing labor for field maintenance and drastically reducing crop yields, from the usual 6-8 bags to only 2-3 bags. Addressing climate change demands a re-evaluation of our

approach to farming and agriculture that extends beyond mere yield optimisation. The current risks and uncertainties stem from practices oriented towards profit maximisation.

A critical aspect of mitigating these challenges is the revival of local crops such as millet. Seed corporations have taken control of the whole seed trade and market. Historically, this has happened to the indigenous breed of cattle, whereby the promotion of hybrid varieties has displaced and dispossessed indigenous species. The same peril looms over heirloom seeds, which, if lost, could jeopardise future generations.

An intergenerational gap and epistemological dualism exist between farmers and the next generation. The conservation of indigenous seeds and farming will be perilous if we do not address this issue. Promoting the culture of seed sharing and mutual exchange through traditional food festivals is imperative.

Today's children are becoming increasingly disconnected from the knowledge of agriculture and food sources, leading to ethical concerns. Many are unaware of crop distinctions and think milk comes directly from a packet. High pesticide levels in food further raise ethical questions. The choice between fast food and traditional dishes becomes crucial in addressing these concerns, as even agricultural science students are showing declining interest in farming. The hope lies in the next generation's willingness to embrace farming practices.

b) Role of heirloom seeds in adaptation to climate change

Hybrid seeds are susceptible to pests, while heirloom crops grow tall and provide ample biomass, ideal for organic mulching. This practice enriches the soil's humus content and overall quality. Heirloom seeds offer a sense of **freedom, autonomy, and control**, unlike hybrid seeds, often controlled by corporate interests.

Additionally, heirloom seeds can regenerate naturally, crucial in the face of climate change challenges. Farmers can rely on their self-reproduction, eliminating the need to seek new sources after failed sowings, fostering seed sovereignty. These seeds can be shared among farmers, reinforcing seed sovereignty. Some native species yield year-round, regardless of seasonal changes, and only native seeds possess the potential for regeneration.

Further, concerning heirloom seeds, sharing them amongst farmers is possible. This ensures seed sovereignty too. Some native species yield produces all year round, irrespective of the change in seasons. Further, only native seeds have the potential to regenerate and reproduce (*maru-ulpatti*).

A critique of the science promoted by the state needs to be prepared to recognise the traditional ecological knowledge of farmers. Therefore, farmers are responsible for conserving indigenous knowledge, practices, and heirloom seeds.



Figure 1. Proactive Youth Engagement: Empower youth to take proactive roles in promoting heirloom seeds and climate adaptation strategies using modern technology and public spaces like schools, colleges, and parks for awareness campaigns

Though hybrid seeds are more prone to pest attacks, they are marketed in the name of high yields. Further, cooking vegetables from hybrid seeds guarantees easy work for people involved, as the peeling of their skin is much easier. Hybrid seeds affect the agency and fecundity of the soil, and thus soil quality declines over time. In contrast, native seeds have the strength to counter pests by nurturing soil fertility.

c) Strategies and Recommendations for future action

1. *Strengthen Local Value Chains:* Prioritise the development and strengthening of local value chains for sharing and selling native seeds and produce, while raising awareness of these initiatives.



Figure 2. Seed Fair

2. *'Farm to Household' Direct Delivery Models:* Explore the feasibility of 'Farm to Household' direct delivery models that eliminate intermediaries. Enable consumers to engage directly with farmers to establish a stronger connection between producers and consumers. Harness the power of word-of-mouth marketing to disseminate knowledge about heirloom seeds, particularly in local regions.
3. *Transform Consumer Behaviour:* Focus on transforming consumer behaviour, with a special emphasis on rural consumer households. While urban consumers may already recognise the benefits of heirloom seeds and natural farming, rural communities should be the primary focus for driving transformative change.
4. *Pest Management Approach:* Shift from pest control to integrated pest management, considering the intricate social-ecological systems at play.
5. *Seed Clubs and Nature Club:* Expand the "Seed Club" model to at least 300 schools in the district, empowering students to engage with nature and heirloom seeds. Identify passionate teachers to lead these initiatives.
6. *Incorporate Native Vegetables in Mid-day Meals:* Promote the consumption of native vegetables by incorporating them into mid-day meal schemes. Strengthen existing kitchen gardens used by meal preparation staff, building on past successes that increased student involvement. Ensure continuity of such strategies even in the event of personnel changes.
7. *Establish 'Nattu Kayi-Kari Angadi' (Heirloom Market):* Launch markets dedicated to heirloom vegetables and crops, creating economic opportunities for small-scale farmers.
8. *Seed Banks and Exchange Markets:* Establish seed banks in various regions and encourage exchange markets for heirloom seeds.
9. *Promote Homestead Farming:* Train individuals in homestead farming and empower farmers to become trainers for the next generation.
10. *Recognition of Indigenous Knowledge:* Bridge the gap between theory and practice in education by introducing curricula on native and heirloom seeds in universities.

11. *Harness Technology*: Utilise modern technology, such as apps, to promote heirloom seeds and climate adaptation strategies. Encourage the planting of indigenous crops in public spaces for awareness.
12. *Agriculture as a Dignified Profession*: Advocate for the recognition of farming as a dignified profession, encouraging youth to pursue agro-entrepreneurship.
13. *Food Security Planning*: Address food security concerns, considering the expected increase in population.
14. *Counter Market Forces*: Challenge market forces that shape consumer behaviour in favor of sustainable, locally sourced food products.
15. *Promote Culinary Skills*: Nurture culinary skills among youth, enabling them to start small food businesses focused on indigenous cuisine.
16. *Water Conservation*: Highlight the importance of well-water for seed quality and address water usage in agriculture.
17. *Proactive Youth Engagement*: Empower youth to take proactive roles in promoting heirloom seeds and climate adaptation strategies using modern technology and public spaces like schools, colleges, and parks for awareness campaigns.



Figure 3. Proactive Youth Engagement: Empower youth to take proactive roles in promoting heirloom seeds and climate adaptation strategies using modern technology and public spaces like schools, colleges, and parks for awareness campaigns

The challenges posed by climate change necessitate a fundamental shift in our approach to agriculture, emphasising resilience over profit. Heirloom seeds and traditional knowledge systems play a critical role in achieving this transformation. To safeguard our agricultural heritage and ensure climate resilience for future generations, a coordinated effort involving government, educational institutions, communities, and the private sector is essential. This policy note provides a roadmap for such a collaborative endeavor, which, if implemented effectively, can pave the way for sustainable and resilient agriculture in India.

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