CRISP
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Seed Village Programme in India: Options to Enhance Performance and Efficacy

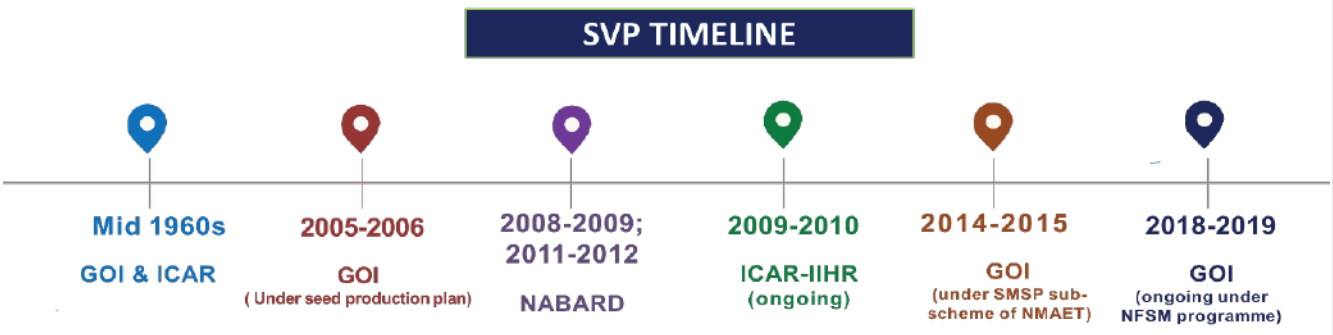
CONTEXT

India is recognized as one of the largest seed markets globally (Kumar et al. 2018), valued at USD 6.3 billion in 2022. Projections indicate a substantial growth to USD 12.7 billion by 2028, with an anticipated annual rate of approximately 12.43% (IMARC 2023). Despite a rising trend in the seed replacement rate (SRR)[1] for major cereals, pulses and oilseeds crops in the country (ICAR 2018), one of the persistent challenges that remain is in ensuring timely access to high-quality seeds of preferred varieties, especially for women and smallholder farmers. This challenge primarily stems from constraints related to obtaining information about varieties and seeds, accessing formal input markets, as well as dealing with issues of mobility and finance (Niti Aayog 2023; Puskur 2021). As a result , farmers, particularly women and smallholders, often find themselves heavily reliant on farm-saved seeds or informal, farmer-managed seed systems (Puskur et al. 2021), accounting for 80-85% of the total seed used (Bhavani et al. 2019). Improving the quality of farm-saved seeds is critical to help vulnerable social groups access quality seeds that could contribute to economic and nutrition security. One of the major objectives of the Seed Village Programme (SVP) is to enhance the quality of these farm-saved seeds[2] (Box 1).

Box 1: Seed Village Programme (SVP)

A 'seed village' is a trained group of farmers engaged in the production of seeds for various crops. They not only meet their own seed requirements but also support fellow farmers within the village and neighbouring villages by providing timely and affordable access to seeds (TNAU 2016). The seed village – as a concept – mainly focused on organized quality seed production in a cluster (or) compact area, for enabling replacement of existing local varieties with new high-yielding varieties, increasing quality seed production and seed replacement rate by meeting the local demand for quality seeds and making the farmers and village self-sufficient and self-reliant with quality seeds (Sastri et al. 2017).

The Seed Village Programme has been implemented in India since the 1960s through the Indian Council of Agricultural Research (ICAR) institutes [3,4,5], the Government of India (GOI) [2], the National Bank for Agriculture and Rural Development (NABARD) [6,7] and other agricultural institutions under several developmental programmes.



Since 2018-2019, the SVP has been implemented across the country as one of the sub-components of the Sub-Mission on Seed and Planting Materials (SMSP) under the National Food Security Mission (NFSM) [8] of GOI. The funding pattern follows a 60:40 share of central and state governments. The state department of agriculture acts as the nodal agency at the state level. Foundation/certified

[1]*1 USD = 83.26 INR

seeds required for one acre are distributed per farmer providing a subsidy on seed cost (50% for cereals and 60% for pulses, oilseeds, fodders, and green manure crops). The implementing agency is provided with financial assistance of INR 15,000 (USD[1]*180.15) to conduct three trainings per group (50-150 farmers per group) on seed production and seed technology. The farmers are encouraged to treat the seeds produced under SVP and are provided with maximum financial assistance of INR 3500 (approximately USD 42.04) per seed treatment drum of 20 kg capacity or INR 5000 (approx. USD 60.09) per drum of 40 kg capacity. Farmers are also supported to develop storage capacity of appropriate quality through provision of financial assistance for purchasing seed storage bins. SC/ST farmers receive a 33% subsidy, capped at approximately INR 1500 (USD 18.02) for 1-ton capacity bins or INR 3000 (USD 36.04) for 2-ton capacity bins. Furthermore, farmers generally receive a 25% subsidy, with a maximum of INR 1000 (USD 12) for 1 ton capacity or INR 2000 (USD 24.01) for 2 tons capacity. Assistance for purchase of only one seed bin per identified farmer is also available under the programme[2].

During 2022-23, as a part of the CGIAR Seed Equal Initiative, the International Rice Research Institute (IRRI) and the Centre for Research on Innovation and Science Policy (CRISP) conducted a study to analyse the effectiveness and efficacy of SVPs. Based on a literature review and fieldwork in Telangana, Tamil Nadu, Odisha, and Karnataka, we identified three distinct models of seed villages for detailed analysis. These include: (1) the ongoing Government of India SVP model implemented through State Departments of Agriculture (SDA) since several years; (2) the National Bank for Agriculture and Rural Development (NABARD) SVP model implemented in Odisha (2008-09 to 2010-11 and 2011-12 to 2013-2014) that is known for its lasting positive impact even a decade after programme completion; and (3) the ongoing ICAR-Indian Institute of Horticulture Research (ICAR-IIHR) SVP model, which is notable for its ability to sustain and replicate the model in other states under the institute's purview. Our objective was to qualitatively assess the effectiveness and efficacy of the SVP through a comparative case study analysis of these models, and propose policy recommendations to enhance its performance, particularly its ability to provide quality seeds of preferred varieties to women and smallholder farmers. The key features of these models are presented in Table 1.

Table 1. Key features of three SVP models

Key features	SDA SVP	NABARD SVP	ICAR-IIHR SVP
Purpose	Enhance the quality of farmer-saved seeds	Empower small-scale farmers to actively participate in seed related businesses and transform these entities into sustainable business ventures	Elevate horticultural farming into a profitable venture and ensure continuous employment opportunities for farmers while guaranteeing them a fixed price for the seed produced by them
Year of Introduction/ Operation	2014-2015	2008-2009 to 2010-2011; 2011-2012 to 2013-2014	2009-2010
Participants	Interested and willing farmers (not limited to any specific category of farmers)	Smallholders	Custodian (contract) farmers of ICAR-IIHR
Seed production	Clusters are formed involving 50-150 individual farmers having half to one acre land from nearby villages. Foundation/certified seeds are distributed at 50% & 60% subsidy on seed cost (cereals and for pulses, oilseeds, green manure & fodder crops)	Farmer Producer Organisation (FPOs) are formed by the implementing agency (NGOs) involving farmers from clusters, supplying foundation seeds (cereals, oilseeds, green manure crops) and fertilizers at 50% subsidy on input cost. Each cluster includes a minimum 30 acres of contiguous land.	Clusters are formed holding 40-50 individual farmers having half to one acre land from nearby villages to whom seeds (breeder/ foundation) and planting materials of vegetables, fruits, flowers, and medicinal crops are distributed with no subsidy on inputs

Training	Provide three-day training for farmers on seed production technologies (1 day each) at the time of sowing, flowering and after harvest – at the time of seed processing	Provide training for both field staff and farmers at frequent intervals from sowing to harvesting, and processing stage of crops	Provide on-campus and off-campus training for farmers before and during critical crop production stages and facilitate farmer-scientist interactions
Monitoring	Seeds Division of the Department of Agriculture and Farmers Welfare monitor via quarterly reports shared by the SDA	NABARD, SDA, and State Seed Certifying Agency (SSCA) monitor via quarterly and fortnightly reports; NGO does regular field monitoring	Frequent field monitoring from ICAR-IIHR experts and technical team
Seed processing and storage	Assistance on one seed storage bin of 1 ton and 2-ton capacity per SVP farmer provided. No explicit mention about processing other than the training at the time of seed processing.	Collectively procure, process and store the seeds by FPOs with facilitation of NGOs.	ICAR-IIHR processes and stores seeds procured from farmers
Value chain actor coordination	Promotes farmer to farmer network within and neighbouring villages	Effective collaboration of FPO members with various actors in the seed chain for seed procurement, testing, certification, and marketing. Strengthens farmer to farmer, FPOs and NGO networks in the district and state.	The institute coordinates with value chain actors – state horticulture department, seed certifying agency, scientists – during the process of seed production. Farmers have limited scope under the scheme due to contractual arrangements.
Market	Promote farmer to farmer marketing within and neighbouring villages for programme implementation. No buyback/market arrangement for farmers by any agency.	FPOs procure seeds from farmer members and sell them in the pre-identified markets within and neighbouring districts in the state. The buyback and market arrangement are done through FPOs with support from the implementing agency.	Buyback by the institute with assured market price
Regulatory frameworks	Limited/no emphasis on seed certification	Mandatory to get seed certification from the State Seed Certifying Agency (SSCA) for the FPO members who produce quality seeds for markets	Seeds produced by farmers are subjected to quality testing (purity and germination test) by IIHR for assured payment
Gender focus	No exclusive focus on gender	Considering the experiences under NABARD SVP model, the NGO 'Nari and Sishu Kalyan Samittee' (NSKS) organised women cooperative exclusively for quality seed production under the name 'DISHA' adopting the operational procedures of NABARD-SVP	Women employed for skill-oriented activities in quality seed production, such as seed treatment; roguing; hand pollination (for crops like cucumber, tomato, squash, pepper and others); seed extraction (e.g., tomato/brinjal and others); post-harvest handling of seeds involving cleaning, drying, processing, packing, storage and others. However, it is not mandatory to employ women.

While all the given models share a common goal of supplying farmers with quality seeds and enhancing their quality seed production capacities, they vary significantly in implementation and effectiveness. Notably, the NABARD-funded SVP has established strong links in the seed supply chain by distributing seeds to farmers, imparting rigorous training for both facilitators and farmers on quality seed production, and providing inputs, seed certification, and market support through FPOs. Among the three models we studied, this model proves to be the most effective and efficacious as it has a commercial objective focused on income-oriented and capacity development activities for smallholders through the formation of FPOs.

Following closely is the ICAR-IIHR model which operates on a contractual mode, ensuring assured income to farmers for producing quality seeds. In this model, farmers are only engaged in the production of quality seeds, and they receive meticulous monitoring and training from ICAR-IIHR experts. However, this model falls short by not providing any direct assistance for covering any expenses incurred by the farmers. The institute is responsible for quality testing and buyback of the seeds for sale. While successful in ensuring assured income for farmers and empowering them with professional skills in seed production, this contractual approach somewhat withholds farmers from exploring post-harvest activities such as seed processing, marketing and engaging with other actors in the seed value chain, in comparison to the other two models. In Odisha, the SVP implemented by the Odisha State Seed Corporation (OSSC), called 'Mo Bihana Yojana', also operates a contract farming scheme where OSSC provides seeds to the seed growers and buys back their produce with limited direct assistance for inputs (seeds) or transportation.

Lastly, the SDA-SVP model showed mixed effectiveness and efficacy, lacking full implementation support as seen in the other two models, except for seed distribution. Despite efforts to promote informal marketing and making seeds available at the village level, inadequate training, weak monitoring, and distribution of certified seeds (instead of foundation seeds in a few cases) have negatively impacted the quality of seed produced. Limited emphasis on the certification process, absence of buyback arrangements for the produce and lack of post-harvest follow-up have also contributed to the mixed outcome.

Given their diverse operational modalities, the effectiveness and efficacy of the SVP differed significantly across models. While all the SVP models undeniably enhanced farmers' access to quality seeds and their capacities to engage in quality seed production, a notable gap exists in their explicit focus on women and vulnerable groups (or lack thereof). The NABARD SVP model stands as an exception, engaging smallholders, which was unclear in other models. However, none of the models distinctly target women farmers for access to quality seeds and income-generating opportunities in quality seed production. The ICAR-IIHR model employs women in skill-oriented activities, but it is not mandatory. There is also inadequate data on the impact of these models, particularly with regard to women farmers.

Recognizing the key challenges in SVP a more inclusive focus in implementation of SVP is called for, especially in targeting women farmers.

KEY CHALLENGES IN SVP

1. **Availability of foundation seeds**: Farmers are willing to produce quality seeds, but they require access to foundation seeds at least once every two to three years. In many cases, certified seeds are distributed, leading to deterioration of seed quality and subsequent yield levels in later years. The unavailability of foundation seeds over a period forces the farmers to depend on certified seeds from the market or use their own poor-quality saved seeds for seed or grain production, thus affecting yields. This challenge is prominently expressed by the farmers of the SDA-SVP model.
2. **Limited/no long-term support**: It was found that the SDA implemented SVP is providing seeds for half an acre to one acre for two years and there is no assured buy-back of the seed produced. Seed certification is also optional, depending on the farmers' interest. Even if a farmer wishes to produce seed on a larger scale, additional quantities of foundation/certified seeds are not provided, discouraging farmers from seed production enterprises. In the case of NABARD-implemented programme, though end-to-end support is extended to farmers through FPOs, maintaining quality of seeds during storage in the initial years of the programme was a challenge. Under the ICAR-IIHR programme, though the institute identifies the farmers and takes up production through MoUs that are renewed every season, farmers are uncertain about their long-term engagement in seed production through the programme. The absence of adequate support could also be a further deterrence to individual smallholders or women farmers to get into seed production.
3. **Seed marketing:** Farmers need an assured market for their produce. For individual farmers, it is a huge challenge to market the seeds they produce

and secure a place in the highly competitive seed market without any institutional support. Increasing competition from private players in the market involves the adoption of new marketing strategies including offering exclusive discounts, showcasing seeds at various regional/national/international events, and providing seeds tailored to customer needs by way of variations in packet size or seeds that are neem coated, or treated with fungicides, insecticides, etc., based on specific customer requirements. This kind of market situation presents a significant challenge to both FPOs and individual farmers in selling seeds produced on their own under the SVP. Specifically, women farmers tend to face even bigger challenges in accessing both input and output markets, further limiting their engagement in seed production.

4. **Farmer-produced seeds falling short of seed certification standards**: Many farmers struggle to meet the quality standards required for seed certification, which go on to become a barrier for entering the competitive seed market. Limited scientific/technical skills in seed production among the staff of implementing agencies and poor skills among farmers with respect to quality seed production and storage of seeds are further contributing to this situation, which was prominently evident in the SDA-SVP model.

5. **Capacity:** Knowledge and skills related to quality seed production, storage, certification, conservation and marketing must be enhanced among the staff implementing SVP and also among farmers. To enhance the skills of farmers, the facilitating field officers from the implementing agencies must have adequate and updated knowledge on quality seed production, post-production activities, certification, marketing, and also on all the guidelines and actors who are directly or indirectly involved in the programme. This was found to be lacking in most of the SVP actors in the case of SDA-SVP where the programme has been completely or partially stopped at a few places.

6. **Value chain actor coordination:** There is a need to promote coordination among the wide range of actors (Table 2) involved in the seed value chain. While this is mentioned in the guidelines, it was not observed in practice in the SDA-implemented SVP. Under the ICAR-IIHR model, due to its contractual nature, the farmers have a limited role in coordinating with value chain actors under SVP. The NABARD model tried networking relevant value chain actors with the FPO.

Table 2. Proposed SVP value chain with key actors and their roles

Value chain functions	Roles	Actors
Seed procurement and distribution to farmers	Ensure timely supply of foundation seeds	National Seeds Corporation (NSC), State Farms Corporation of India (SFCI), State Seeds Corporation (SSC), and State Seed Farms (SSF)
	Conduct needs assessment and place intended for seed procurement	Implementing Agency (IA)
	Mobilise farmers (small and marginal farmers/women/ vulnerable communities) into groups	IA, NGOs/ FPOs
	Awareness creation about SVP	SDA, IA, NGOs
Seed production	Timely provision of assistance in the form of resources, trainings and other extension activities	SDA, IA, NGOs
	Conduct regular monitoring	IA
Harvesting, processing and storage	Assist in seed certification process	IA, State Seed Certifying Agency (SSCA)
	Provide support for infrastructure facilities such as processing plant, warehouses and packaging	IA, SDA, NABARD
Marketing	Facilitate market access by helping farmers in establishing market linkages	IA, NGOs, FPOs Private seed companies
	Ensure buyback arrangement	IA
	Promote farmer to farmer (informal) marketing	IA, NGOs
Business development Services	Awareness and networking	Nodal agency, IAs
	Business consultancies	Financial institutes, private sectors, SDA, IA, KVKs, public-private incubation centres, development organizations
	Provision of technical consultancy	University, research institutes, KVKs, training institute, experts from public or private sectors and other development organizations
Enabling environment	Creating an enabling environment is the responsibility of all the actors in the value chain who coordinate and converge in the possible actions to promote quality seed production	All concerned actors from start to end

RECOMMENDATIONS AND THE WAY FORWARD

There is an urgent need for promoting the decentralized production of high-quality improved seeds by strengthening the seed value chain in SVP. Some of the ways forward are as follows:

1. **Implement SVP through farmer groups**
   Shift the implementation of SVPs from individual farmers to farmers organized under FPOs, Farmer Interest Groups/Farmer Clubs, or existing farmer groups promoted by IAs as observed in the NABARD SVP model. There is a need to increase the focus on engaging smallholders, women and women's collectives in seed production to promote timely access to quality seeds by these categories of farmers (Nanavaty 2022; Puskur 2021).

2. **Enhance provision of funding for quality seed production**
   In the cases we looked at, there is partial funding or in some cases no provision of funding for inputs (seeds, fertilizers), infrastructure (storage facilities, seed processing, transportation), marketing (information on market, regulatory frameworks such as certification, licensing and market access), human resources (exclusive staff for implementing SVP), and training for both implementers and farmers including provision of updated educational materials, workshops, and refresher trainings. The kind of end-to-end support observed in the NABARD model was found to be missing in SDA-SVP and ICAR-IIHR. There is a need to review the funding for SVP on different components, and there should be specific allocations for funding infrastructure, marketing, human resources, capacity building and inputs under SVP.

3. **Distribute foundation seeds**
   Considering the dissatisfaction of farmers with the quality of certified seeds received under the programme (under SDA-SVP model), it is recommended that only foundation seeds be distributed in the SVPs. Certified seeds tend to lose vigour year after year more rapidly in comparison to foundation seeds. Moreover, commercially available certified seeds may not be suitable for ensuring quality seed production by farmers. So, there is a need to make sure that only foundation seeds are distributed among farmers for seed production.

4. **Strengthen monitoring and evaluation (M&E)**
   Regular monitoring of SVP during production and post-production processes by the IAs, like the one followed in the NABARD and ICAR-IIHR SVP models, is critical for quality seed production. Currently, Monitoring and Evaluation (M&E) only focuses on seed distributed, seed produced, and number of seed villages formed during the implementation year (maximum of two years in a location). M&E of SVP programmes should also include assessment of the sustainability and viability of the seed enterprises. Furthermore, this should include tracking the growth of new seed entrepreneurs who expand their seed production to multiple crops beyond the implementation period.

5. **Ensure buyback arrangement**
   Ensuring buyback of quality seeds produced will ensure quality training and supervision, as well as incentivise farmers to engage in quality seed production. This was clearly observed in the ICAR-IIHR model. In the case of NABARD SVP model, the FPO is responsible for buyback. Such arrangements are critical for ensuring the success of SVP.

6. **Improve coordination of Value chain actors**
   Improving coordination among various actors engaged in implementation, training, monitoring, certification, marketing, etc., as discussed in Table 2 can ensure seamless execution of SVPs. Such coordination can also ensure that women and farmers from other vulnerable social groups are equally supported with access to quality seeds and capacity development opportunities.

7. **Mapping sources of quality seed and creating linkages for seed producers**
   Mapping sources of quality seeds, especially foundation seeds, at the block level and making them available to seed producers through local institutions such as Gram Panchayats and Department of Agriculture offices can be highly beneficial. This is not happening currently, but the need for such an arrangement was pointed out by several stakeholders during our interactions as this can ensure that seed producers, particularly women and smallholder farmers, have access to seeds even after the seed supply from IA stops at the completion of the programme.

8. **Inclusive quality seed production**
   Currently, women are not specifically targeted in SVP. The implementation guidelines do not mention the role of women as seed producers or the need to enhance their capacities. SVP guidelines should be revised to explicitly indicate measures to be implemented so that women farmers and women FPOs are intentionally supported under the SVP.

It is envisioned that the effectiveness of the Seed Village Programme can be enhanced through the provision of better access to foundation seeds for

farmers, better market linkages, improved monitoring and evaluation frameworks, better mapping of the sources of quality seeds, improved coordination among the various actors of the seed system, and applying a gender-responsive approach to the entire programme. This holistic approach would be a valuable contribution to seed systems and could bring in greater social equity through improved nutrition and economic security to agri-food systems as a whole.

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Endnotes

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