

The Role of Seed Production and Quality Control System in Viksit Krishi Sankalp

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INTRODUCTION

The "Viksit Krishi Sankalp Abhiyan" represents a paradigm shift in Indian agriculture, moving toward a future defined by sustainability, resilience, and high productivity. Launched with the definitive vision of transitioning scientific research from "Lab to Land," this national campaign bridges the gap between agricultural innovators and grassroots practitioners. To build a Viksit Bharat (Developed India), the agricultural framework must evolve past traditional methodologies to tackle modern structural challenges, including climate variations, dwindling natural resources, and shifting economic dynamics. Within this overarching blueprint, the Seed Production and Quality Control System emerge as the critical linchpin. Since the seed forms the biological foundation of all crop production, its development, certification, and systemic distribution directly govern the efficacy of every other downstream agricultural input. In the context of Viksit Krishi Sankalp, a robust seed and quality control ecosystem does not merely serve as a logistical support mechanism; it acts as a primary catalyst for national food security, climate-smart adaptation, and enhanced rural prosperity.

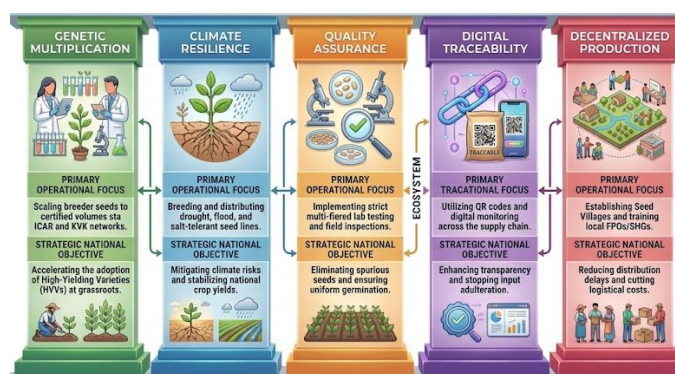


Figure 1: Key Pillars of the Seed Ecosystem in Viksit Krishi Sankalp

The Foundational Importance of High-Yielding and Climate-Resilient Seeds

Under the Viksit Krishi Sankalp framework, a principal objective is increasing crop yields while concurrently minimizing resource footprints. High-Yielding Varieties (HYVs) and climate-resilient seeds are central to this goal. Agricultural scientists deployed during the campaign have highlighted that traditional seed varieties often fail to withstand the emerging threats of volatile weather, delayed monsoons, and pest outbreaks. The seed production system is tasked with multiplying breeder and foundation seeds into certified seeds that possess explicit genetic traits tailored for modern challenges.

These specialized seeds include drought-resistant, flood-tolerant, and short-duration varieties that allow for seamless crop diversification. For instance, in areas facing seasonal water scarcity or shifting rainfall patterns, the introduction of short-duration and low-water-use rice and wheat varieties allows farmers to maximize land utility without exhausting groundwater reserves. By ensuring that these advanced genotypes are scaled up from research laboratories to commercial volumes, the seed production system directly translates biotechnological breakthroughs into tangible field-level results.

Strengthening the Regulatory Fabric: The Quality Control System

A major challenge identified through direct farmer feedback during the Viksit Krishi Sankalp campaigns is the proliferation of substandard, misbranded, or adulterated inputs. Poor seed germination and high weed pressures significantly compromise initial crop stands, leading to cascading financial losses for rural households. Herein lies the indispensable role of a rigorous Quality Control System.

Quality control acts as the regulatory shield protecting farmers from market vulnerabilities. It encompasses a multi-layered

verification process that monitors genetic purity, physical purity, moisture content, and optimal germination percentages. By strengthening public sector certification bodies and utilizing digital monitoring tools for agricultural traceability, the system ensures that every bag of seeds reaching a village cluster meets statutory national standards. Enhanced quality control protocols eliminate the risk of introducing seed-borne pathologies and guarantee uniform field emergence. This reliability builds institutional trust, encouraging small and marginal farmers to confidently transition away from low-yielding, farm-saved seeds toward certified, high-performance alternatives.

Facilitating Decentralized and Community-Based Seed Systems

Viksit Krishi Sankalp places immense emphasis on localized solutions and the empowerment of rural communities, particularly women's Self-Help Groups (SHGs) and Farmer Producer Organizations (FPOs). Recognizing that centralized seed distribution networks can occasionally suffer from delayed input delivery and logistical bottlenecks, the campaign advocates for decentralized, community-based seed production systems.

Through this decentralized model, village clusters are trained by Krishi Vigyan Kendras (KVKs) and ICAR institutes to manage "Seed Villages." Farmers are educated on the technicalities of maintaining isolation distances, removing off-types (roguing), and proper post-harvest handling to avoid mechanical mixtures. This localized production significantly reduces transportation costs and ensures that regional crop preferences are preserved. Furthermore, integrating quality control mechanisms at the community level creates local employment and establishes a self-sustaining rural economy where high-quality seeds are readily accessible ahead of the critical Kharif and Rabi sowing windows.

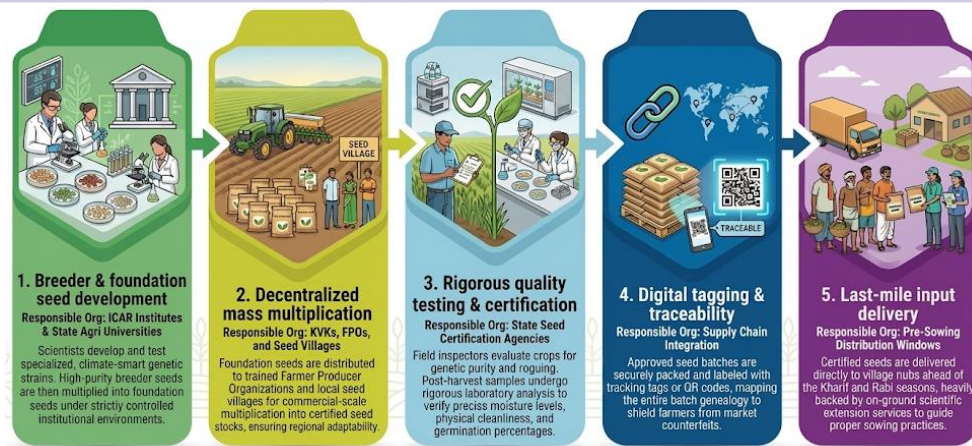


Figure 2: Implementation Workflow for Certified Seed Distribution

Driving Crop Diversification and Nutritional Security

National agricultural self-reliance requires a balanced focus across all food sectors, specifically reducing import dependencies on vital commodities like pulses and oilseeds. The seed production architecture under Viksit Krishi Sankalp is strategically pivoted to accelerate the multiplication of high-oil-content oilseed varieties and biofortified pulses.

By prioritizing the seed chains of these specific crop groups, the system facilitates swift crop diversification. Providing farmers with healthy, certified pulses and oilseeds incentivizes them to break monocultural cycles that deplete soil health. Moreover, because biofortified seeds are naturally enriched with essential micronutrients like iron, zinc, and protein, their systematic production directly combats hidden hunger and strengthens national nutritional security, aligning perfectly with the holistic development goals of Viksit Bharat.

Synergizing with Modern Technology and Extension Services

The integration of the seed ecosystem with advanced digital and mechanical technologies is a core tenet of the Viksit Krishi Sankalp Abhiyan. The quality control apparatus increasingly relies on digital traceability infrastructure, such as Quick Response (QR) codes and blockchain ledger technologies, to map a seed’s journey from the breeder’s plot to the retailer’s shelf. This level of transparency

effectively curtails the black-marketing of spurious inputs.

Simultaneously, the seed production system is structurally aligned with resource-saving agronomic practices promoted during the campaign, such as Direct-Seeded Rice (DSR). Since DSR requires specialized seed treatments and precise seed quality to counter early weed competition, the quality control system ensures that distributed seeds are pre-optimized for mechanized sowing. This close synergy between physical seed traits and modern field engineering maximizes water use efficiency and significantly drives down the overall cost of cultivation.

CONCLUSION

The Viksit Krishi Sankalp Abhiyan establishes a visionary roadmap for a progressive, inclusive, and future-ready agricultural sector. Within this framework, the Seed Production and Quality Control System serve as the cornerstone of structural transformation. By transforming scientific innovations into resilient, high-yielding seeds, and backing them with strict quality certification and digital traceability, the system protects farmers from environmental and market risks. As India marches toward its goal of becoming a global food supplier and a fully developed nation, optimizing the seed-to-land ecosystem remains the single most impactful strategy to elevate farm productivity, double rural incomes, and ensure long-term environmental sustainability