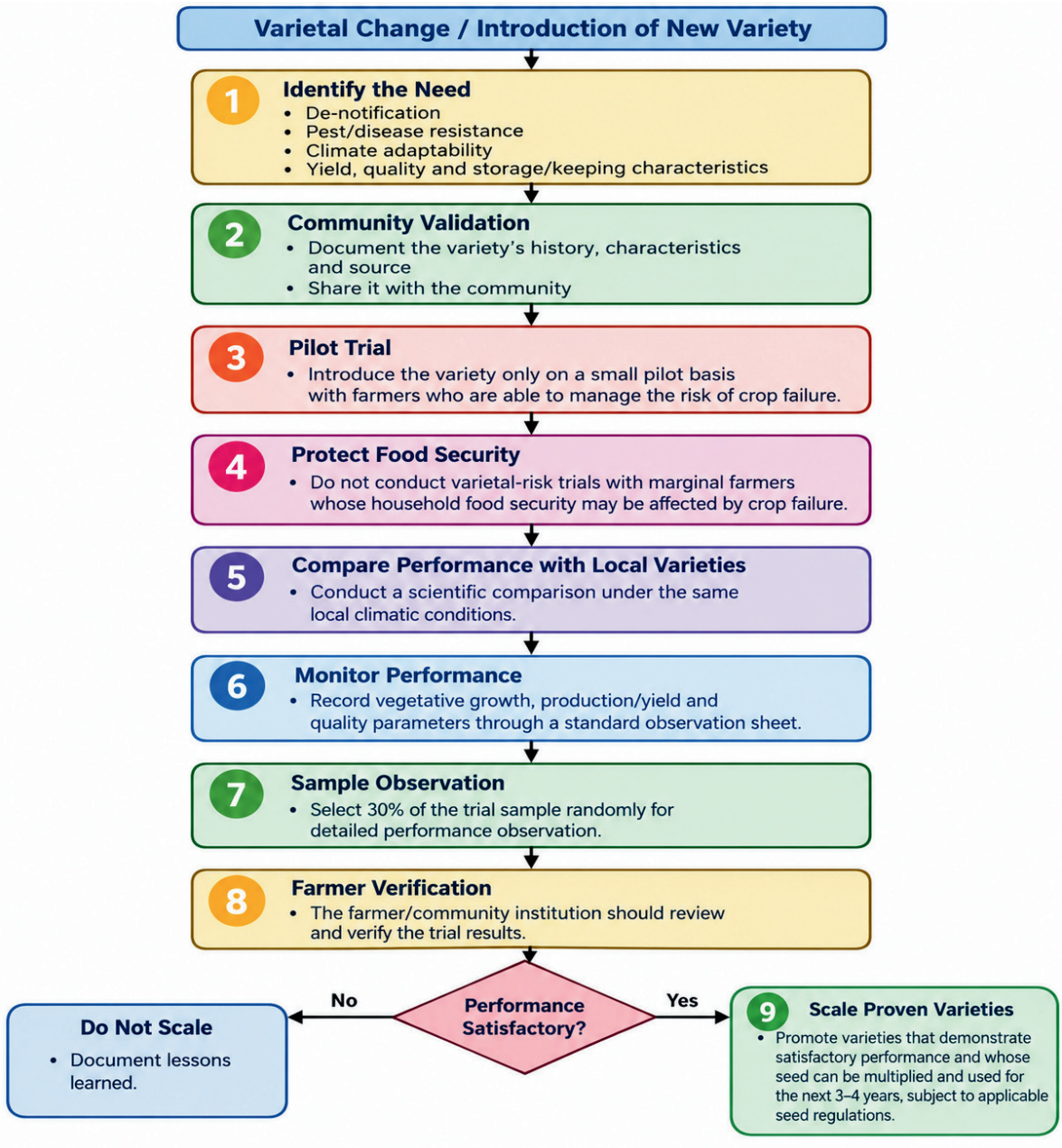
Chapter-4

Seed Promotion and Seed Replacement Strategy

In India, in general farm saved seed (FSS) is the most prominent source of seed for staple crops. More than 70 percent of seed usage, particularly for food crops, is through FSS but the quality of FSS has deteriorated due to improper selection and conserving practices of seeds resulting in poor performance of the FSS. Therefore, it requires the promotion of quality seeds in two ways one is the promotion of improved seed varieties and the second is building the farmer's capacity to conserve the quality seed in the form of FSS.

Principle: Seed promotion should be two-way—both introduction of suitable new varieties and replication/replacement of proven varieties.

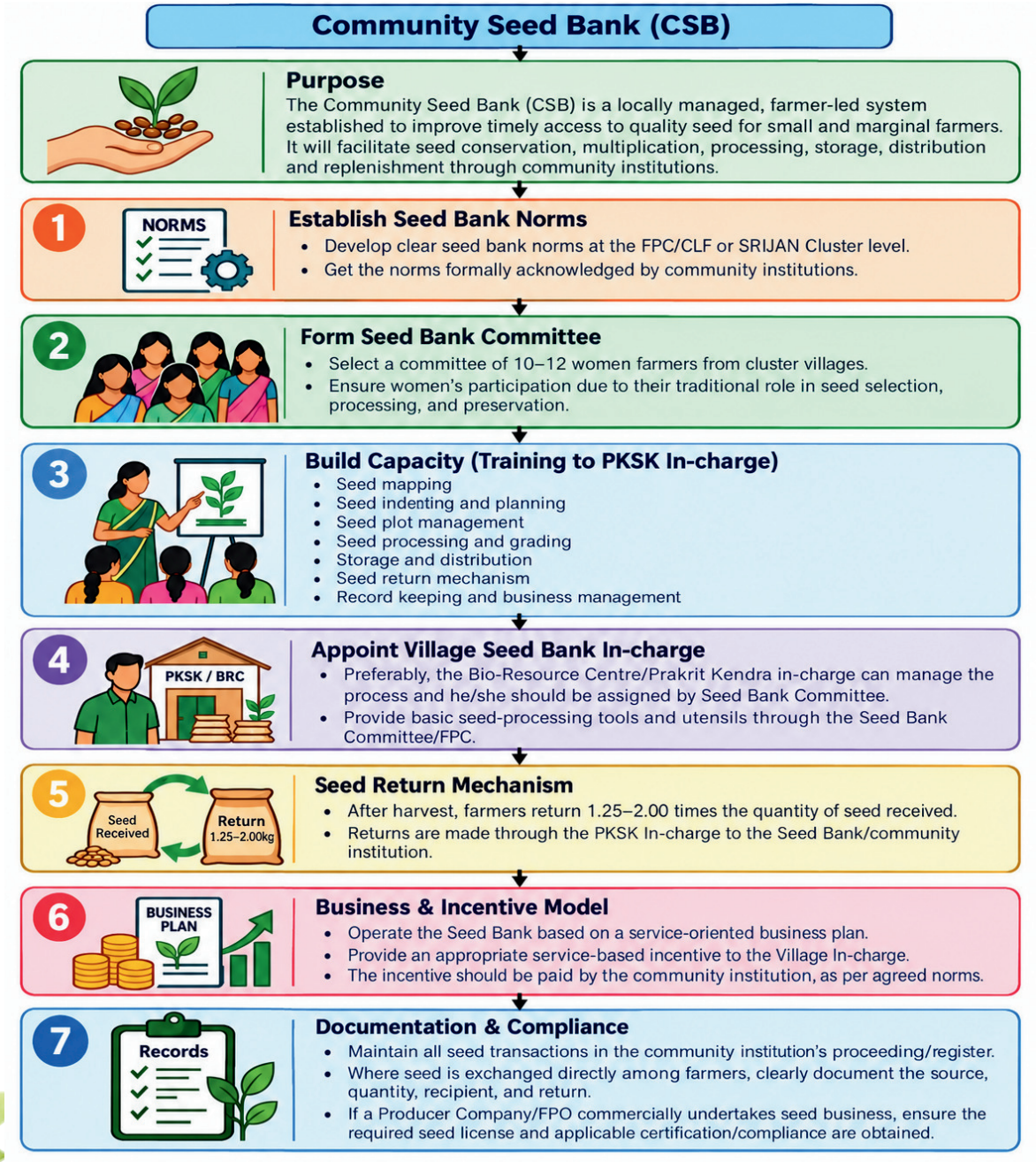
A. Varietal Change / Introduction of New Variety



B. Replication / Seed Replacement of Proven Varieties

1. **Identify Eligible Varieties –** upport varieties that are commonly used but have become physically impure or whose seed quality has deteriorated.
2. **Use Proven Varieties –** Promote well-known locally preferred varieties or varieties that have successfully completed pilot testing.
3. **Prioritize Seed Replacement –** Give priority to small and marginal farmers who have been unable to replace seed for the last 3–4 years due to lack of funds or access to quality seed. Do not provide replacement seed of the same variety regularly year after year.
4. **Build Farmer Seed Capacity –** Train farmers to conserve, select and maintain quality seed at their own level for the next 3–4 seasons/years, as appropriate to the crop.
5. **Monitor Performance –** Select 10% of the sample randomly for detailed observation of varietal/seed performance.

A. Seed Bank



B. Seed Indenting

Purpose: To ensure timely, demand-driven, transparent and quality-assured seed procurement and distribution based on farmers' actual requirements.

Seed Mapping – at least 3-4 months before sowing

- Conduct FGDs with farmer groups/community institutions.
- Map crop and variety preferences, quantity required, agro-climatic suitability, procurement sources and timelines.
- Varietal selection should be undertaken with farmer groups/community institutions.
- Give priority to notified and suitable varieties.
- Local/traditional/farmer-conserved seed should only be included with a documented technical justification.

Seed Demand Collection at least 1-2 months before sowing

- Collect farmer-wise seed demand based on the approved seed mapping.
- Complete farmer registration and collect the prescribed farmer contribution at least 10%.
- Consolidate demand at PKSK and forwarded to apex institution like FPO/CLF or cluster level.
- Prepare the consolidated seed indent based on verified farmer demand.

Procurement & Quality Verification

- Submit the indent sufficiently in advance to the Government Seed Corporation/authorized seed agency/Locally Farmers Custodian.
- Procure only from approved/authorized sources.
- Verify variety, seed class, certification/quality documents, lot number, quantity, packing and validity before acceptance.

C. Seed Plot

Purpose: To establish and manage farmer seed-production plots that maintain varietal identity, genetic purity, seed quality and traceability, while involving farmers and community institutions in seed production.

Select Suitable Plots

Avoid plots with a history of serious pest/disease outbreaks and unsuitable previous crops. Select plots that reasonably represent the village's local agro-ecological conditions.

Prefer Suitable Crops

Give preference to self-pollinated or predominantly self-pollinated crops (Paddy, Wheat, Barley, Oats, Chickpea, Pea, Cowpea, Lentil, Green gram, Black gram, Soybean, Common bean, Moth bean, Linseed, Sesame, Sun hemp, Chilly, Brinjal, Tomato, Okra, Peanut, Potato, *etc.)*, as maintaining genetic purity is generally easier than in cross-pollinated crops.

Establish Seed Plots Separately

Use identified seed, maintain separate sowing and harvesting practices, and clearly identify each seed plot to prevent mixing or contamination.

Regular Monitoring

- Monitor plots fortnightly, particularly during critical crop-growth stages.
- Rouging-Regularly remove off-types, volunteer plants, diseased plants and plants with undesirable physiological characteristics before critical reproductive stages.
- Phenotypic Selection – Select healthy, vigorous and true-to-type plants for seed production based on defined varietal characteristics.
- Border Management-Exclude the produce from the 3–5 meters border area, where applicable, to minimize contamination from adjacent fields.

Separate Harvesting & Handling

Harvest seed plots separately from general crops and maintain separate threshing, cleaning, drying, storage and identification.

Seed Processing & Drying

- Keep harvested seed in a dry, shaded place for 1–2 days.
- Sun-dry for 5–7 days until moisture reaches approximately 8–10%.
- Grade seed based on size, shape, and removal of inert material.

D. Seed Storage

Purpose: To ensure safe, hygienic and systematic storage of quality seed while maintaining seed viability, preventing moisture damage, and minimizing insect and rodent infestation.

Select Storage House

- Locate the seed storage house at a central place within the cluster.
- Preferably use a cemented building; a well-maintained mud or tin house may also be used if necessary.

Store Quality Seed Only

- Store only cleaned and properly graded seeds.
- Prefer suitable, labelled seed bags for storage.
- Treat storage bins/bags with appropriate bio-pesticide to reduce insect and fungal damage.

Proper Stacking and periodic rotation

- Stack bags maximum up to 6 bags high.
- Keep bags on wooden pallets/rafts or bricks to raise them above the floor.
- Maintain a gap from the walls to allow air circulation.
- Regularly rotate the stacked bags by moving the lower-layer bags to the top and vice versa.

Pest & Rodent Management

- Regularly inspect the storage area for rodent, insect and other pest attacks.
- Take timely preventive/control measures using appropriate methods.

Maintain Ventilation & Hygiene

- Keep the storage house clean, dry and well-aerated.
- Avoid moisture entry and overcrowding of seed bags.

E. Seed Germination Test

Purpose: To assess the germination capacity of seed lots before distribution or sowing and to determine whether the seed meets the optimum plant population in the field or require calibration the recommended quantity.

Select the Seed Sample

- Take a representative sample from the seed lot.
- Use a minimum of 100-200 seeds for the test.
- The sample may be divided into:
- 4 replicates × 50 seeds, or
- 8 replicates × 25 seeds.

Prepare the Germination Medium

- Use clean, moist paper or cotton cloth.
- Place the seeds evenly between two layers of moist paper/cloth.
- Avoid excessive waterlogging, which may cause fungal growth or seed rotting.

Prepare the Seed Rolls

- Cover the seeds with the second layer of paper/cloth.
- Roll the paper/cloth loosely into a towel roll, ensuring that seeds have sufficient space for germination.
- Label each replicate with the crop, variety, seed lot/batch and date of testing.

Incubate the Seeds

- Keep the rolls upright at room temperature in a clean location.
- Maintain adequate moisture throughout the testing period.
- Protect the test from direct sunlight, excessive heat and disturbance.

Observe Germination

- Start observations after germination begins.
- Depending on the crop and environmental conditions, germination may occur over approximately 5–14 days.
- Count and record the number of normally germinated seedlings in each replicate.

Calculate Germination Percentage

Germination % = (Number of normally germinated seeds ÷ Total seeds tested) × 100

Assess Seed Quality

- As a programme benchmark, the preferred seed lot should have at least 70% germination, subject to applicable crop-specific standards.
- Record the test result in the Seed Quality/Germination Test Register.
- Seed lots showing poor germination should be reviewed before distribution.

Adjust Seed Rate Where Necessary

- Where seed is otherwise acceptable but germination is below the recommended level, the seed rate may be adjusted based on the actual germination percentage, provided this is agronomically appropriate.
- Such adjustment should be documented and communicated to farmers before sowing.

Distribution & Documentation

- Distribute seed against the approved farmer-wise demand.
- Maintain stock, distribution and farmer contribution records.
- Obtain farmer acknowledgement and maintain seed traceability.

F. Seed Treatment

Purpose: To improve seed health, support early crop establishment and promote beneficial microbial activity through appropriate biological seed treatment before sowing.

Select Seed Treatment bio-inoculants/bio-formulation

- Options include:
  - Locally prepared Beejamrit, or
  - Trichoderma + NPK Consortia, or
  - Trichoderma + Azotobacter/Rhizobium + PSB + KSB.
- If Beejamrit is used for seed treatment, apply Trichoderma separately through enriched compost or Ghanjeevamrit.

Treat the Seed

- For seeds having a coarse rough or hairy surface, bio-inoculant powder may be applied directly to the seed.
- For seeds having a smooth surface, use the bio-formulation mixed/diluted with an appropriate quantity of clean water. Avoid excessive wetting of the seed.
- Use the recommended quantity of formulation as per the product label or crop-specific recommendation.
- Mix the selected bio-formulation uniformly with the seed so that the seed is adequately coated.
- Spread treated seed in a shaded place. Allow it to dry for approximately 30 minutes–2 hours.
- Sow the treated seed within 6 hours of treatment. Avoid prolonged storage of treated seed before sowing.

