Course Title: Seed Systems Development & Quality Seed Production

- **Duration:** 5 Days (approximately 35-40 instructional hours)
- **Course Goal:** To equip farmers, seed producers, extension workers, and development practitioners with the knowledge, practical skills, and strategic understanding to produce high-quality seeds of important local crop varieties and to establish and manage sustainable community-based seed systems that enhance seed security, conserve agrobiodiversity, and improve farmer livelihoods.
- **Core Focus:** Mastering both the technical skills of quality seed production and the social/organizational aspects of building robust local seed systems.

Learning Objectives:

Upon successful completion of this workshop, participants will be able to:

- **Analyze** the differences between formal and informal seed systems and understand their respective roles in seed security.
- **Apply** the principles of seed biology, genetics, and variety maintenance to produce high-quality seed.
- **Master** the technical field practices for quality seed production, including site selection, isolation, rouging, and appropriate harvesting.
- **Implement** effective post-harvest seed handling, including drying, cleaning, treating (if needed), and storage to maintain viability and vigor.
- **Conduct** basic seed quality testing for germination, purity, and moisture content.
- **Design** and facilitate the establishment of community-based seed systems, such as Community Seed Banks or farmer seed enterprises.
- **Facilitate** Participatory Variety Selection (PVS) to identify and promote farmer-preferred varieties.
- **Understand** the basics of local and national seed policy and its implications for community seed systems.
- **Develop** a comprehensive action plan for initiating or improving a seed production or community seed system initiative.

Target Audience:

- Lead Farmers and representatives of Farmer Organizations/Cooperatives involved in or aspiring to seed production.
- Agricultural Extension Workers and Agronomists.
- NGO staff and Development Practitioners working in agriculture, food security, and agrobiodiversity conservation.
- Staff of local seed enterprises or social ventures.
- Researchers interested in participatory plant breeding and strengthening local seed systems.

Prerequisites:

- A solid understanding of basic agricultural practices and crop production.
- An interest in seed saving, local crop varieties, and community-based agricultural development.

Teaching Methodology:

This is a highly interactive and experiential workshop. The methodology includes:

- **Interactive Lectures & Case Studies:** Introducing concepts using real-world examples of successful seed systems.
- **Hands-on Practical Sessions:** The core of the course. This includes seed selection, cleaning, germination testing, and quality assessment.
- **Field Visit (if feasible):** A structured visit to a seed production plot, a community seed bank, or a local seed company.
- **Problem-Solving Workshops:** Participants work in groups to design seed production plans and community seed bank operational models.
- **Guest Speakers (optional):** Inviting a successful seed entrepreneur, a community seed bank leader, or a representative from a national seed authority.
- **Action Planning:** Developing practical plans that can be implemented back in their communities or organizations.

Materials Provided:

- Comprehensive digital or printed workbook with key concepts, practical guides, and data sheets.
- A "Seed Producer's Toolkit" with field guides for rouging, checklists for quality control, and templates for record-keeping.

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- Materials for hands-on activities (e.g., diverse seed samples, germination trays, sieves, moisture testing materials).
- Templates for a Seed Production Plan and a Community Seed Bank Charter.
- Information on local/national seed policies and relevant support organizations.
- Certificate of Completion.

Detailed Day-by-Day Curriculum

Day 1: Understanding Seed Systems & The Science of Quality Seed

- **Module 1: The World of Seeds: Systems & Security (Approx. 2.5 hours)**
  - Welcome, introductions, and course objectives.
  - Defining Seed Systems: **Formal** (certified, public/private) vs. **Informal/Farmer-Managed** systems.
  - The Four Pillars of **Seed Security:** Availability, Access, Quality, and Use/Choice.
  - The critical role of local seed systems in resilience and agrobiodiversity.
  - **Activity:** "My Seed Story" – Participants map their own seed sources and identify the strengths and weaknesses of the systems they rely on.
- **Module 2: Seed Biology & Genetics for the Seed Producer (Approx. 2 hours)**
  - The seed's lifecycle and germination requirements.
  - **Pollination is Key:** Understanding Self-Pollinated, Cross-Pollinated, and Vegetatively Propagated crops and the different management required for each.
  - The basics of genetic purity and how to maintain a variety's unique traits.
- **Module 3: Defining & Recognizing Quality Seed (Approx. 3 hours)**
  - The four components of "Quality Seed":
    1. **Genetic Quality:** Is it the right variety and is it pure?
    2. **Physical Quality:** Is it clean, whole, and uniform?
    3. **Physiological Quality:** Will it germinate well and produce a vigorous plant? (Viability & Vigor).
    4. **Seed Health:** Is it free from seed-borne diseases and pests?
  - **Hands-on Lab:** Participants examine different seed samples to visually assess physical quality and identify defects.
  - **End of Day 1 Recap & Q&A.**

Day 2: The Practice of Quality Seed Production

- **Module 4: Planning for Quality: Site Selection & Isolation (Approx. 2.5 hours)**
  - Choosing the right field for seed production (history, soil health, location).
  - **Isolation:** The critical technique to prevent genetic contamination in cross-pollinated crops.
    - Isolation by distance.
    - Isolation by time (staggered planting).
    - Isolation by barrier (physical or biological).
  - Developing a seed production plan and calendar.
- **Module 5: Field Management for High-Quality Seed (Approx. 2.5 hours)**
  - Agronomic practices tailored for seed production (vs. grain/fruit production).
  - Optimizing plant population, nutrient management, and irrigation for seed development.
  - Managing pests and diseases with a focus on preventing seed-borne pathogens.
- **Module 6: Rouging: The Art of Maintaining Varietal Purity (Approx. 2.5 hours)**
  - What is rouging? Why it is the most important skill for a seed producer.
  - Identifying and removing "off-types," diseased plants, and problem weeds.
  - When to rogue: Key stages in the crop lifecycle for effective rouging.
  - **Intensive Practical Session:** Using high-quality photos, videos, or a field walk, participants practice identifying plants that should be rouged from a seed production plot.
  - **End of Day 2 Recap & Q&A.**

Day 3: Harvest, Post-Harvest & Quality Testing

- **Module 7: Optimal Harvesting & Threshing for Seed (Approx. 2.5 hours)**
  - Determining physiological maturity for maximum seed quality.
  - Harvesting techniques that minimize mechanical damage and shattering losses.
  - Proper methods for threshing or extracting seeds to maintain viability.
  - The importance of cleaning equipment to prevent contamination between varieties.
- **Module 8: Seed Drying, Cleaning & Storage (Approx. 3 hours)**
  - The critical role of proper **drying** to achieve safe moisture content for storage.
  - Low-cost, effective drying methods (sun drying, solar dryers, ventilation).
  - **Cleaning & Grading:** Using sieves and winnowing to improve physical purity.
  - **Storage Principles:** The science of keeping seeds alive (cool, dry, dark, protected).

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    - Hermetic storage technologies (e.g., PICS bags, super bags) and other improved storage options.
    - **Hands-on Workshop:** Participants practice cleaning a batch of seed using simple, manual techniques.
- **Module 9: Basic Seed Quality Testing (Approx. 2 hours)**
    - **Hands-on Lab:** Participants learn to set up and interpret simple, low-cost tests:
        1. **Germination Test:** (e.g., paper towel, sand, or soil method).
        2. **Physical Purity Test:** Separating a sample into pure seed, other crop seed, weed seed, and inert matter.
        3. **Moisture Content Test:** (e.g., the salt bottle method or a simple crunch test - conceptual).
    - **End of Day 3 Recap & Q&A.**

Day 4: Building Community Seed Systems

- **Module 10: Introduction to Community Seed Systems (CSS) (Approx. 2 hours)**
    - Why CSS? Rationale and benefits (resilience, biodiversity, farmer empowerment, access).
    - Different models: Community Seed Banks (CSBs), Farmer Seed Enterprises, Seed Fairs.
    - Key success factors for sustainable CSS.
- **Module 11: Establishing & Managing a Community Seed Bank (CSB) (Approx. 3.5 hours)**
    - A step-by-step guide to establishing a CSB:
        - Community mobilization and needs assessment.
        - Developing a charter and governance structure (leadership, rules).
        - Infrastructure and equipment needs.
        - Seed acquisition, regeneration, and quality control.
        - Distribution mechanisms (e.g., seed loans, cash sales).
        - The importance of meticulous record-keeping.
    - **Workshop:** Participants work in groups to design a simple governance structure and operational rules for a case study CSB.
- **Module 12: Participatory Variety Selection (PVS) & Farmer-Led Breeding (Approx. 2 hours)**
    - What is PVS? Involving farmers in testing and selecting new or traditional varieties in their own environment.
    - The PVS process: Sourcing diversity, trial design, participatory evaluation.
    - Linking PVS to the community seed system to multiply and disseminate preferred varieties.
    - Introduction to Participatory Plant Breeding (PPB).
    - **End of Day 4 Recap & Q&A.**

Day 5: The Business of Seed, Policy & Your Action Plan

- **Module 13: Small-Scale Seed Business Management (Approx. 2.5 hours)**
    - Moving from saving seed to selling seed: The entrepreneurial mindset.
    - Simple business planning for a farmer seed enterprise.
    - Calculating the cost of seed production and setting a fair price.
    - Marketing quality seed within the community and to local markets.
    - Understanding quality declared seed (QDS) systems (if applicable).
- **Module 14: Navigating Seed Policy & Regulations (Overview) (Approx. 1.5 hours)**
    - (This module must be highly localized).
    - An overview of the national seed law and its implications for farmer-managed seed systems.
    - Understanding variety release and certification processes in the formal system.
    - Advocacy for policies that support local seed systems.
- **Module 15: Your Seed System Action Plan (Capstone) (Approx. 3 hours)**
    - **Capstone Workshop:** Participants synthesize their learnings to create a practical action plan.
    - This could be:
        1. A detailed plan for producing high-quality seed of one crop on their own farm.
        2. An outline for establishing a Community Seed Bank in their community.
        3. A simple business plan for a small-scale seed enterprise.
    - Participants present their action plans for peer and instructor feedback.
- **Module 16: Course Review & Commitment to Action (Approx. 1 hour)**
    - Review of the key principles for quality seed production and community seed systems.
    - Open forum for final questions and sharing key insights.
    - Participants share one key commitment from their action plan.
    - Course evaluation and closing.

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