



Seed Quality Assurance System through Participatory Guarantee System (Draft for discussion)

DEVELOPED BY
Centre for Sustainable Agriculture

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1. Introduction

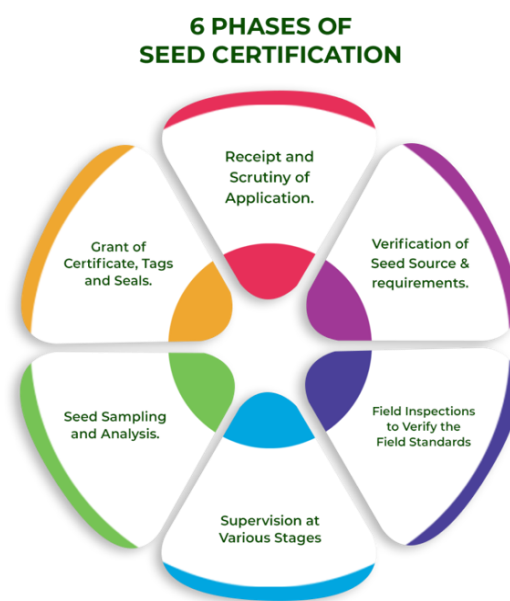
The Participatory Guarantee Scheme (PGS) is an integral component of a decentralized, farmer-led seed system that aims to empower farmer groups with the collective authority to validate the standards of truthfully labeled seeds (TLS). Mainstream seed certification procedures require a licensed seed officer to verify the quality of seeds in accordance with the Indian Minimum Seed Standards and provide certification. Several farmers, especially smallholder and women seed producers, might not be able to adhere to or afford the stringent requirements of formal certification procedures. These marginalized farmers might also struggle to obtain the necessary agri-inputs to meet the standards laid down by mainstream seed certification procedures. Hence, a trust-based quality assurance approach to seed authentication that is farmer-led is likely to benefit them.

In this context, the PGS is a mechanism to promote inclusion in the seed chain by promoting the system of TLS. The PGS transfers the responsibility of quality assurance and certification from government seed officers to farmer groups, collectively registered as Seed Growers' Associations. These associations collectively facilitate the procurement of seed and provide their members advice on processes and practices necessary for quality seed production. They determine valid sources of foundation seeds and certify the seeds produced by member farmers based on assessment of seed sources as well as seed production processes through regular inspection and record keeping. In this manner, some of the bureaucratic hurdles that marginal farmers might face in getting their seeds certified can be mitigated. While promoting equity and diversity within the seed chain, the PGS also ensures that seed quality is preserved.

2. Phases of Seed Certification

Certification shall be completed in six broad phases listed under

- **Seed Grower Registration:** with details of the crop, variety, and source of seed.
- **Verification of seed source:** class of seed (breeder/foundation seed), source
- **Field inspections** to verify the conformity of the standing crop to the prescribed field standards.
- **Supervision** of post-harvest stages including processing and packaging;
- **Seed sampling and analysis**, including genetic purity test and / or seed health test, if any, to verify conformity to the prescribed standards and
- **Grant of PGS Seed certificate** and certification tags, bagging and sealing.



3. Seed Certification Procedures

- Seed producers are organized into a group and the group registers with the Seed Growers Association.
- Farmer/Seed producers' groups can procure foundation seed from the Seed Growers Association or can source it themselves. The seed producer group should peer review to verify the source and submit relevant evidence of source such as certification tags, seals, labels, seed containers, purchase records, sales records etc., as may be demanded by the association during scrutiny of the application and/or during the first inspection of the seed crop to confirm that the seed used for raising the crop has been of good quality (both physical and genetic), obtained from a source approved by the Association and conforms to the class of seed required for seed production. The seed producer group should maintain a source-verification register containing relevant information as prescribed for verification by the Association.
- After source verification, application for certification should be submitted in the prescribed FORM-1 to the concerned Association.
- FORM-1 should be submitted within 30 days from the date of sowing or 15 days from the date of transplanting.

- The relevant seed certification charges such as Registration fee, inspection fee grow out test charges (wherever necessary), seed testing charges, etc. should be remitted along with FORM-1, (See Annexure-1)
- Separate FORM-1 should be submitted for certification of each variety. The FORM-1 should contain complete details of the name and address of the seed producer; season of production; name and address of the grower; location of the seed plot; crop/ variety and class of seed to be produced; area under seed production; details of parental seed materials used with lot number; date of sowing and the particulars of seed certification charges remitted.
- In a single application from a group, the maximum area that can be offered for certification is 50 acres. Additional areas will require a separate application.
- No inspection and registration fee will be refunded once the seed plot has been visited / inspected by the Seed Certification Officer.
- The seed producer group should assist the Association members in locating the seed plots during the first inspection.
- Seed producer groups should guide their respective group members in agronomic practices, pest/disease control etc., for seed production.
- At the time of procurement, the seed producer group should ensure that only seed from plots meeting all the prescribed field standards for certification is accepted for processing at the recognized seed processing plants.
- All necessary care should be taken to avoid admixture during harvesting, threshing and transportation.
- Harvested seed produce from the approved fields should be brought to the seed processing unit and seeds are certified within 2 ½ months from the date of harvest.
- Certification of a seed lot will be taken up only if the seed lots have met the prescribed field and seed standards.

4. Field inspection

Inspection of the standing crop is an essential step in verifying the conformity of seed crop to prescribed minimum seed-certification standards, All the registered seed production fields will be inspected by qualified, trained and experienced field inspectors identified by the Seed Growers Association.

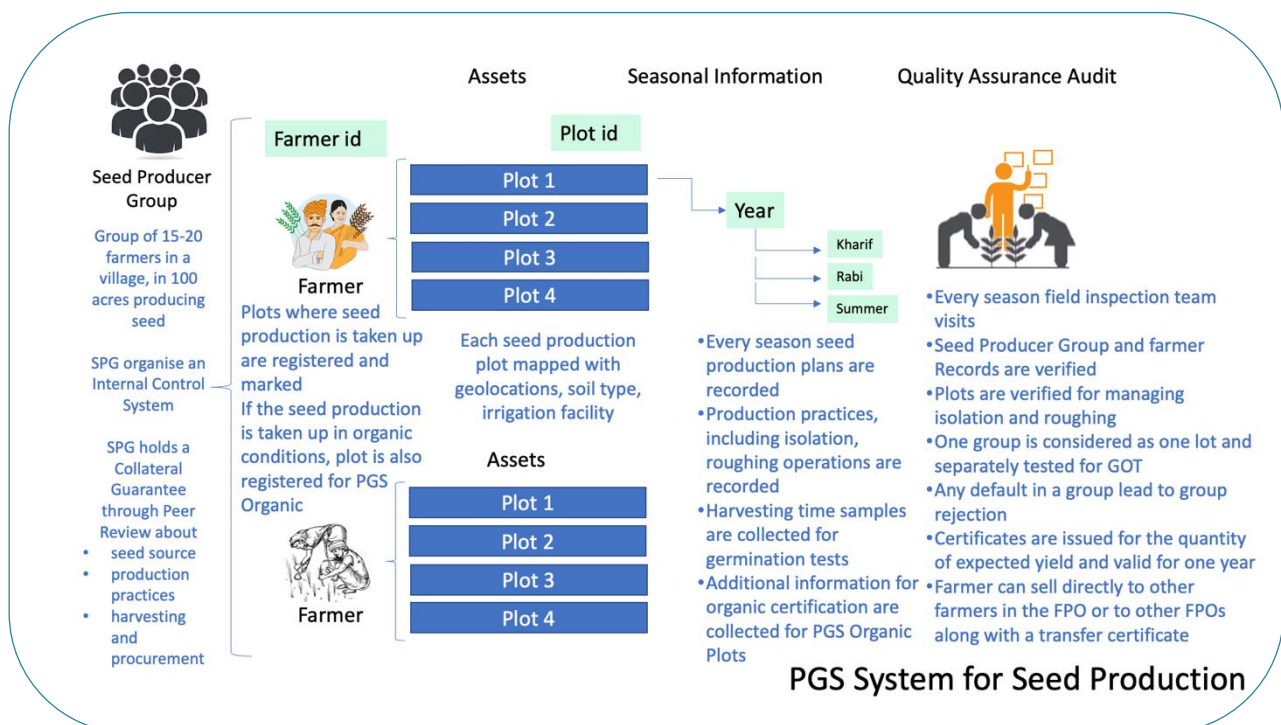
Verification of all factors affecting seed quality in the field may not normally be possible in a single inspection as all the conditions in the field may not be apparent or may not occur at the same time or all of them may not affect seed quality at the same stage of crop growth. Hence, the peer review report of the seed producers group becomes

important, and two or more inspections phased to cover all the important stages of crop growth may be required in highly cross-pollinated crops. The number of inspections and the stages of crop growth at which they should be conducted vary from crop to crop depending on crop duration, pollination behaviour, susceptibility to contamination, disease-susceptible stages, nature of the contaminating factors, etc.

Accordingly, field inspection of seed production plots is conducted at the vegetative or pre-flowering stage, flowering stage, post-flowering, and pre-harvest stage.

Field Inspections at vegetative or pre-flowering stages are done to

- confirm the actual acreage planted and compare it with the acreage allotted or for which the application was submitted and to record the excess area if any and to confirm the actual date of sowing/planting.
- verify, for hybrid seed crops involving two different parents, whether the grower has followed the recommended planting ratios and border rows and has marked the end of each male row:
- verify the presence of any contaminant within the prescribed isolation distance, guide the grower in solving the isolation if any and advise the grower to remove the same before flowering.
- advise the removal of all off types based on vegetative characters.
- guide the grower on the correct method and procedure of detasseling in maize, emasculation and pollination in cotton etc.



Inspections during the flowering stage are done to

- check the occurrence and removal of pollen shedders in bajra, sorghum, sunflower, etc. and off types, objectionable weeds, diseased plants, inseparable other crop plants etc.
- detect in hybrid seed production fields involving two parents, errors in planting ratios and marking of the ends of male rows.
- detect the occurrence of any contamination within the isolation distance and determine the area to be rejected due to inadequate isolation.
- guide the grower in solving nicking problems wherever applicable.
- and verify the morphological characters of the crop.

Inspection at post-flowering and preharvest stages is done to

- confirm that the observations on planting ratios, planting of border rows, off types, detasseling of maize crosses, and removal of pollen shedders in bajra, sorghum, sunflower etc. during previous inspections are reasonably accurate and the defects in these factors had not escaped attention in earlier inspections.
- confirm that the grower had done through rouging after the inspection at flowering.
- verify the removal of contaminating factors, objectionable weed plants and diseased plants/heads.
- educate the grower about harvesting technology, give guidance regarding the care to be taken during harvesting, threshing and transportation, and assess the expected yield (approximate) from the seed crop.

Seed producers' group should ensure that Seed crops meeting the prescribed field standards for certification will be harvested, threshed separately. The seed harvest from each plot is given a lot number and transported to seed processing plants identified and verified by the Seed Growers Association along with a Final Field Inspection Report issued by the concerned Field inspector.

5. Rejection of seed plots

The Seed Growers Association has the authority to reject seed plots offered for certification on the following grounds.

- The isolation distance is inadequate.
- The seed crop does not conform to the prescribed field standards for any factor or contaminant.

- One-third or more of a self-pollinated crop is so heavily lodged as to render it impossible to take the field counts.
- One-third or more is lodged just before or during flowering so that inspection during flowering is difficult / not possible.
- The application in Form-1 has been submitted late viz., when the crop has crossed the flowering stage by the time of the first inspection.

6. Re-inspection

In case seed fields are rejected due to nonconformity to the prescribed field standards at a certain inspection, the association shall, at the producer group's request and after removal of the source of contamination or contaminant plants in the seed field by the grower, undertake one re-inspection over and above the number of inspections prescribed for the crop provided the removal of the source of contamination can ensure conformity of the seed crop to the standards prescribed and provided further that no irreversible damage has been caused to the quality of the seed by the contaminant(s)

7. Harvesting, threshing and transportation

A seed crop meeting the field standards for certification shall be properly harvested, threshed, dried and transported to the registered seed processing unit and certified within one month from the date of harvest. During these operations, the seed producer group should take all necessary precautions to safeguard seed quality by preventing seed admixture and other causes of contamination at any stage not supervised by the Association.

8. Spot sorting, shelling and certification of seed produce

For crops like maize, potato and groundnut, seed sorting, shelling etc. can be taken up at the field level with peer review as the transportation of the bulk seed produce may not be economical and there is lack of adequate storage space at the seed processing unit or any other-reasons to the satisfaction of the divisional head of seed certification.

FORM 1

S. No	Particulars	Remarks
1	Farmer Name	
2	Father Name	
3	Age (years)	
4	Phone Number	
5	Farmers ID	
6	Name of the FPO associated with	
7	Name of the Village	
8	Crop Name	
9	Variety Name	
10	Class of Seed being produced (If released)	

	Breeder Seed Foundation Seed Certified Seed Truthfully Labeled Seed	
11	Source of Seed	
12	Area under Production (Acres)	
13	Cultivated Season (Kharif / Rabi / Summer)	
14	Year of Seed production	
15	Field Geo-Location	
16	Seed rate (Kg/Acre)	
17	Seed Treatment	
18	Previous crop	
19	Previous Variety	
20	Date of Sowing	
21	Date of Transplantation (if Applicable)	
22	Seed treatment? (Yes/No) <i>If yes, Mention the process</i>	
23	Adjacent Crop	
24	Adjacent Variety	
25	Distance from the adjacent crop (in Meters)	

FORM 2: PARTICIPATORY VISITS WITH NEIGHBORING FARMERS / FPO

TEAM:

Inspectional Visits	Date of Action	Topics/Issues discussed/ observations	Person details	Remarks	Farmer's Signature
1st Inspection (After sowing)					
2nd Inspection (15 DAS)					
3rd Inspection (30 DAS)					
4th Inspection (45 DAS)					
5th Inspection (60 DAS) 1st Roughing (Kindly refer to the field standards)					
6th Inspection (75 DAS)					

7th Inspection (90 DAS) 2nd Roughing ((Kindly refer to the field standards))					
8th Inspection (105 DAS)					
9th Inspection (120 DAS) 3rd Roughing ((Kindly refer to the field standards))					
10th Inspection (135 DAS)					
Drying Monitoring for Contamination free					

FORM 3: QUALITY ASSURANCE: AUDITOR VISITS

Crop	Variety	Date of Action	Practices Followed / Observations	Suggestions	Decision (Approved / Rejected)	Name and signature of the Auditor

FORM 4: HARVEST AND HANDLING SEED RECORD

Crop Name	Variety name		
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Date(s) of seed harvest

Insect damage

Disease damage

Seed cleaning method

Total weight at the time of Harvest
(Qtls/Acre) with moisture

Weight of cleaned seed @12% moisture

Details of the processing unit

Have followed the precautions to maintain seed quality while processing the seeds (Yes /No)

Details are in **Annexure 2**

Storage conditions

Date germ tested

Days to germination

Percentage of germination

Notes on the quality of the crop grown from this lot:

Annexure 1:

Seed and Field Standards for Paddy

S.No	Seed and Field Standards	Truthfully Labelled (Released and Traditional Varieties)	Maintained as per the standards (Yes/No) If no: Reason
Seed Standards			
1	Pure Seed (Min)	98%	
2	Inert Matter (Max)	2%	
3	Huskless seeds (Max)	2%	
4	Other Crop Seeds (max)	20 / kg	
5	Other distinguishable varieties (Max)	20 / kg	
6	Total weed seeds	20 / kg	
7	Objectionable weed seeds (Max)	5 / kg	
8	Seeds infected by paddy bunt (Neovossia horrida (Tak.) Padwick & Azmatulla Khan).	0.5%	
9	Germination % (min)	80%	
10	Moisture (max)	13%	
11	For vapour proof containers (max)	8%	
Field Standards			
12	Fields of other varieties (Meters)	3	
13	Fields of the same variety not conforming to varietal purity requirements for certification (Meters)	3	
14	Off-types (%)	0.20	
15	Objectionable weed plants (%)	0.020	

Note: These standards have been proposed for Paddy Crop only and for the other crops kindly access to the link: <https://tinyurl.com/2p8pvsmc>

Annexure 2:

Basic precautions to maintain seed quality while processing the seeds

- Separation of Seed Lots: Avoid cross-contamination by clearly segregating different seed lots, especially when processing multiple varieties of seeds. (Maintained: Yes/No)
- Equipment Cleaning: Regularly clean and sanitize processing equipment to prevent the transfer of contaminants from one batch/lot to another. (Maintained: Yes/No)
- Cleanliness: Maintain a clean and hygienic working environment. Regularly clean equipment, floors, and storage areas to prevent contamination of seeds. (Maintained: Yes/No)
- Storage Conditions: Store seeds under appropriate conditions to maintain their quality, considering factors like temperature, humidity, and light exposure. (Maintained: Yes/No)
- Quality Control: Implement a rigorous quality control process, including visual inspections and seed testing to identify and remove poor-quality seeds. (Maintained: Yes/No)
- Pest Control: Implement pest control measures to prevent infestations in storage areas. This may include using traps, chemicals, or other pest management techniques. (Maintained: Yes/No)
- Labeling: Clearly label all containers, bins, and bags with information about the seed variety, lot number, varietal category and any special handling instructions. (Maintained: Yes/No)
- Traceability: Maintain records of seed processing activities, including processing dates, lot numbers (issued by the FPO), and quality test results. This helps trace the source of any quality issues. (Maintained: Yes/No)

Centre for Sustainable Agriculture

#12-13-568, Street No. 14,
Near Uni Rail, Lakshmi Starch Colony,
Nagarjuna Nagar Colony, Tarnaka,
Secunderabad, Telangana, Pin – 500 017
Ph No: 85006 83300, Email Id: csa@csa-india.org