Inefficient varietal promotion of rice
about 525 varieties have been released in India. Of these, only the top 10 varieties account for 60% and the bottom 57 varieties for 1% of production.

Gramin Vikas Trust is implementing the Western India Rainfed Farming Project, funded by Department for International Development, United Kingdom, Government of India, State Governments and Krishi Bharati Cooperative Limited (KRIBHCO). The project is working for sustainable livelihood enhancement of poor women and men in communities in highly risk prone tribal dominated areas covering seven districts, namely Jhabua, Dhar & Ratlam (Madhya Pradesh) Banswara & Dungarpur (Rajasthan), Dahod & Panchmahal (Gujarat). This paper presents the results of the programme and collaborative research using a participatory plant breeding strategy developed with Gujarat, Rajasthan and Madhya Pradesh Agriculture Universities.

Participatory varietal selection (PVS) is a farmer participatory approach for identifying improved crop cultivars or varieties. It is a rapid and cost-effective process of identifying farmer-preferred cultivars.

Key assumptions
- Cultivars are not adopted by farmers because of inefficient varietal promotion.
- Poor adoption is not due to lack of willingness to adopt; or lack of a good choice of materials.

Varietal promotion and adoption
- Choice of cultivars should be provided to farmers.
- Farmers should identify suitable cultivars from a basket of choices.
- Number of cultivars adopted would increase.
- Speed of adoption would also increase.

Reasons for the approach
- Avoid recommended but unacceptable varieties.
- Select elite varieties that give benefit
- Test in farmer's and farmer-managed fields.
- Provide a basket of choice.
- Facilitate rapid and easy adoption.
- Consider farmer-relevant crop trials.

Search process for seed identification
- Farmer’s needs assessment through participatory rural appraisals (PRAs) focused on group discussion on crops.
- Breeders’ advanced lines.
- Cultivars in advanced stage of testing, including failed entries.
- Private sector releases.
- State releases.
- National releases.

Alternative to farmer’s variety
While conducting a search for crop yields and farmers’ needs, consider farmers’ preferences and varietal parameters (traits) learned from the PRAs.

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May 2001
- Consider farmer-relevant crop traits.
- Provide a basket of choices.
- Facilitate rapid and easy adoption.

**Phases of a successful PVS program**
- Identification of farmers' needs in a cultivar.
- Search for suitable material to test among farmers.
- Experimentation on its acceptability in farmers' fields.
- Wider dissemination of farmer-preferred cultivars.

**A brief description of the types of PVS**

The fundamental description of various approaches of PVS is presented here but the details will vary, depending upon the resources available.

**Mother Trials (Initial Evaluation Trials-IETs)**

Single replicate designs (mother trials) are used to assess the relative performance of varieties. Many entries are grown together in the same field. The trials are researcher-designed but farmer-managed, and they are replicated across villages. These trials are very useful as initial evaluation trials (IETs), when there is a large number of entries and promising entries are to be short-listed for the FAMPAR trials in the following years. When conducted simultaneously with the FAMPAR trials they serve as demonstration plots or focal points for discussions and are also specifically designed to provide quantitative, analysable data on yield. Researchers' interventions are very effective as they are responsible for trial evaluation, including the collection of yield data.

**Farmer-managed experimentation**

The extent of farmers' participation varies in the different testing and evaluation systems. Many on-farm trials are conducted by researchers on farmers' fields with little or no involvement of farmers. In contrast to this method, farmers can be given a range of cultivars to grow with minimal intervention from outsiders such as scientists and development workers.

**Tips**
- Benefits of outside intervention can be maximised by simple methods.
- Only one cultivar per farmer.
- Comparision of new and local cultivars.
- Management practices and inputs used by the farmer.

**Farmer managed participatory research (FAMPAR) varietal trials**

A farmer grows one new variety alongside the local variety under the customary management practices. Replication is across farmers, either in the same village or also across villages. Even if there are many new varieties, only one variety is tested by any one farmer. The trials are evaluated by participatory methods (farm walks, focus group discussions and household-level questionnaires) and quantitative data, (e.g., yield can be obtained by project staff in collaboration with farmers).

**Informal research and development (IRD)**

IRD is a cheaper form of PVS because it uses less intensive evaluation. In IRD programmes small quantities of seed of the same range of varieties used in FAMPAR trials are supplied to farmers. No monitoring or participatory evaluation is done during the growing season, but farmers' perceptions are evaluated after harvest, using informal interviews. Subsequent adoption and farmer-to-farmer seed dissemination provides the evidence for the degree of acceptance of each variety. FAMPAR trials satisfy the needs of research, extension, and the farmer, while IRD is predominantly targeted at extension.

**Adaptive informal research and development (AIRD)**

This represents an intermediate stage between FAMPAR trials and IRD approach.

- FAMPAR trials are primarily a research tool for identifying which varieties farmers prefer (but they also have an extension role).

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**Diagram**

**Farmer participation in participatory varietal selection (PVS)**

- Mother trial or Initial Evaluation Trial (IET)
- FAMPAR (farmer managed participatory research)
- Adaptive IRD (informal research and development)
- IRD (informal research and development)

*Fig 1: Approaches to participatory varietal selection with varying levels of farmer participation*
- IRD trials are primarily an extension tool to spread varieties (but they also have a research role).
- Adaptive IRD falls between these extremes.

**Participatory assessment**

Farm trials can be evaluated for their performance using various participatory tools, such as:
- farm walks;
- pre- and post-harvest focused group discussions; and
- household level questionnaires.

**Simple farm experiment**

Methods of varietal selection with varying degrees of farmer participation

<table>
<thead>
<tr>
<th>Method</th>
<th>Evaluation of data</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researcher-managed and evaluated on-station trial</td>
<td>Yield</td>
<td>Research</td>
</tr>
<tr>
<td>Researcher-managed on-farm trials (replicated design)</td>
<td>Yield</td>
<td>Research</td>
</tr>
<tr>
<td>Farmer-managed, scientist-supervised, on-farm trials (several entries, single replicate)</td>
<td>Yield, farmers’ perceptions</td>
<td>Research, NGO extension</td>
</tr>
<tr>
<td>Farmer-managed, on-farm trials (unreplicated design with one cultivar per farmer; replicated across farmers)</td>
<td>Yield farmers’ perceptions</td>
<td>NGO, research, extension</td>
</tr>
<tr>
<td>Farmer-managed, on-farm trials (unreplicated design with one cultivar per farmer; replicated across farmers)</td>
<td>Farmers’ perceptions only</td>
<td>NGO, extension research</td>
</tr>
<tr>
<td>Farmer-managed trials (no formal design)</td>
<td>Informal, anecdotal</td>
<td>NGO, extension, research</td>
</tr>
</tbody>
</table>
Focused PRAs conducted by Western India Rainfed Farming Project.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Farmer-preferred trials</th>
<th>Farmer landraces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>Extra-early (70 days) to early (85 days) maturing types; tall, non-lodging types; upland, direct-drilling types; coarse to medium grain types with varied husk colour (red, black, and straw); sticky (for cooking) types</td>
<td>Pathariya, Dhibri, Dabda Kolam, Rati Hal, Nani Hal</td>
</tr>
<tr>
<td>Maize</td>
<td>Extra-early (75 days) to early (85 days) maturing types; white, flint grain types</td>
<td>Telni, Nangi gangri, Dudhmogar</td>
</tr>
<tr>
<td>Black gram</td>
<td>Early, spreading type with bold, shiny grains; early, dull, black-seeded types</td>
<td>Teliya, Kuvestiya</td>
</tr>
<tr>
<td>Chickpea</td>
<td>Early (70 days) less water requirement and better marketability and insect resistance.</td>
<td>Dahod Yellow</td>
</tr>
</tbody>
</table>

A case study
In 1993-96, the WIRFP conducted farm trials in 15 clusters of villages in the districts of Panchmahals (Gujarat), Jhabua (M.P.) and Banswara (Rajasthan). Three crop varieties were highly preferred by farmers. These were Kalinga III (upland, direct-drilled rice), Shweta (early, white, composite maize), TPU-4 (black-seeded black gram) and ICCV2 and ICCV10 (chickpea).

Contributions have been made by DFID; TC consultants + GVT Team Members.

White Maize Variety - GDRM 187 developed under the PVS / PPB Programme