

Operational Research Program for Food
Security and Sustainable Livelihood:
A case study on Participatory Varietal
Selection (PVS)

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Presentation outline

- Theoretical foundation of operational research
 - Why Participatory Action Research ?
 - Evolution of research and development thinking
 - Agricultural Research and Innovation Continuum
- Components of operational research
- Participatory Varietal Selection: the process and outcomes
- Scaling-up

Why Participatory Action Research ?

- The conventional research and development model:
 - Has failed to provide appropriate and relevant technologies that support agricultural and economic development
 - Has not taken sufficient time to understand clients needs, priorities and practices
 - Underpinned by instructional and blue-print approach

Evolution of research and development

Period	Explanation to farmers non-adoption	Prescription	Key extension activity	Socio-economic research frontier	Dominant research methods
1950s & 1960s	ignorance	Extension	Teaching	Understanding the diffusion & adoption process	Questionnaire surveys
1970s & 1980s	Farm level constraint	Remove constraint	Supplying inputs	Understanding FS	Constraint analysis FSR
1990s	Technologies doesn't fit	Change the process	Facilitating farmers participation	Enhancing F competence, changing professional behaviour	Participatory research by and with Farmers

Objectives of Operational Research Programme

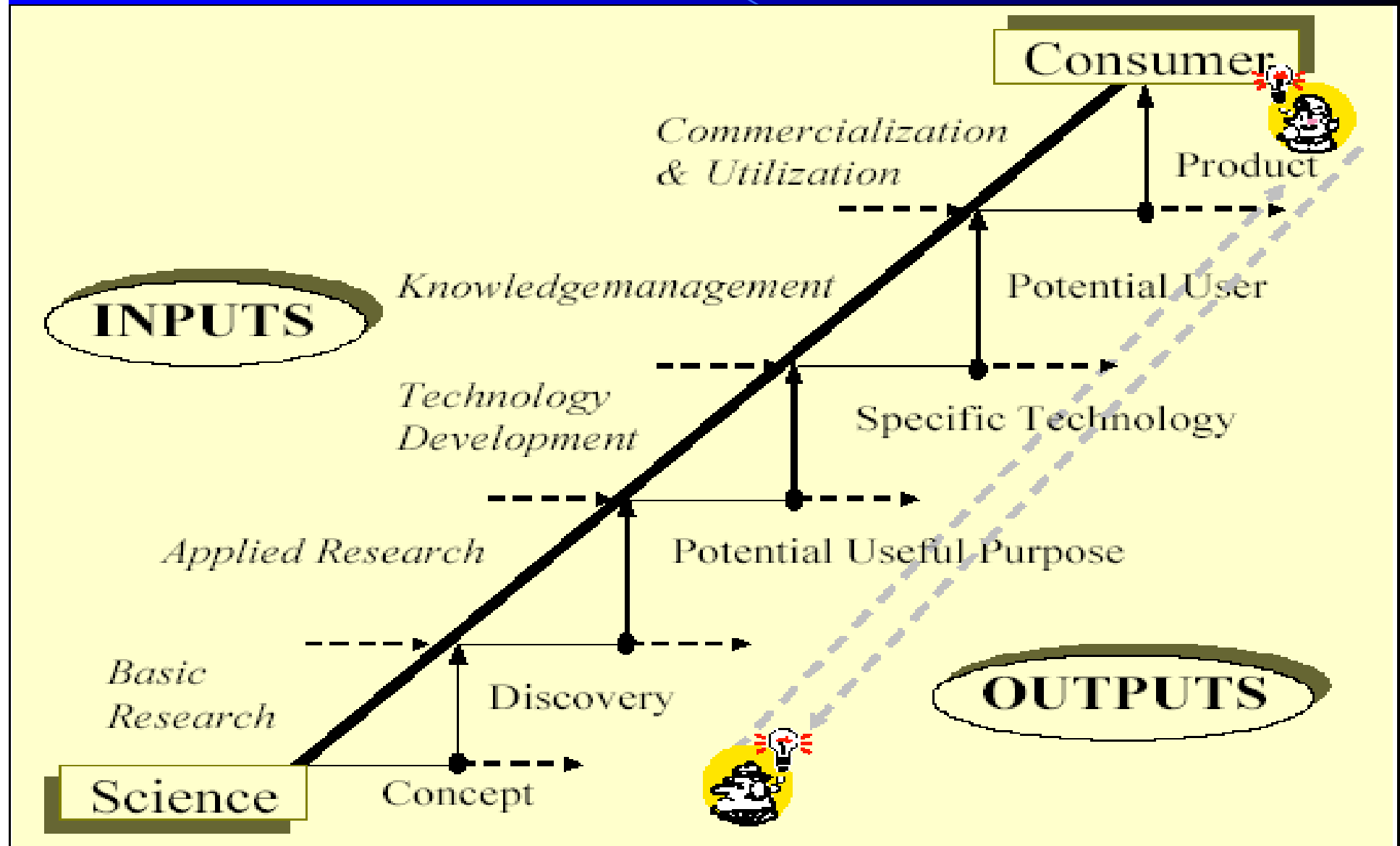
1. Undertake relevant and appropriate research “in-situ” that is farmer-led, disseminated to all relevant stakeholders, and which informs future program orientation;
- 2. Conduct training needs assessment for farmers, development agents, subject matter specialists, and key policy makers in the region; design/modify training materials as appropriate, and deliver appropriate training and related capacity-building activities.



What PAR change?

- PAR recognize that innovation is a social competence (several actors or stakeholders are involved and contribute successfully and less successfully in the process)
- PAR demand new methodologies, institutional set-up and professional attitude
- PAR links research, development and policy

Agricultural Research and Innovation continuum



Components of Operational research

- **Diagnostic and site characterization:** a wide range of participatory appraisal on bio-physical and socio-economic aspects was undertaken (PRA, SLS, Transect survey on vegetation and feed resources, HIV/AIDS etc.)
- **Farm recording:** was carried out with farmers selected and trained to keep a **daily record** of all their farming operations as well as inputs and outputs.
- **Technology testing and dissemination:** different action researches in crop, livestock and forage development, soil and water conservation has been conducted

Participatory Varietal Selection (PVS)

- Participatory Varietal Selection (PVS) is a process of active and functional involvement of farmers in the planning, implementation, monitoring and evaluation of crop varieties and their promotion
- PVS can be used to identify **acceptable new varieties** and thereby overcome the constraints that cause farmers to grow landrace and obsolete cultivars
- PVS exploit local expertise (farmers' wisdom) and local resources (farmers land in place of on-station plots) in achieving outputs that are more appropriate to the environment

PVS process and outcomes

- *Selection of varieties:* Five varieties of haricot bean; three varieties of soybean, five varieties of teff, and four varieties of wheat were tested
- *Selection of farmers:* A well-being ranking, largely based on the levels of food sufficiency and resource endowment, was conducted at the beginning to allow farmers from different well-being categories to be equally represented in Farmers Research Groups (FRG).
- A total of 25 farmers were selected for FRG in each PA

FRG has played the following roles in the process of PVS

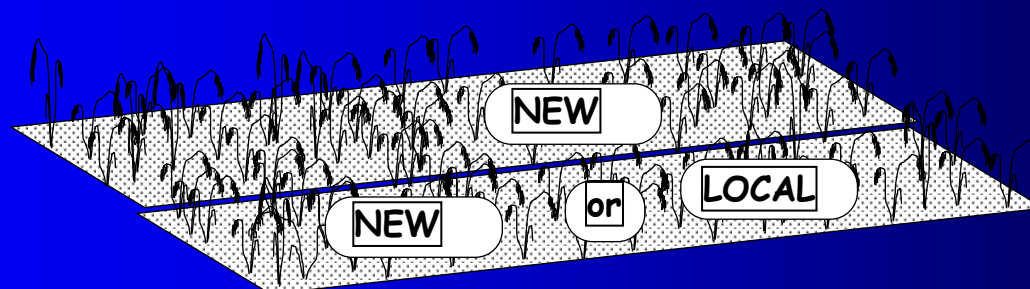
- Actively participate in action research activities
- Participate in testing and selecting appropriate technologies and practices
- Share their knowledge and expertise with researchers and development practitioners
- Mobilize the communities for field days, trainings and seminars
- Play a model farmers role

PVS Design

- Mother and baby trials was employed due to its simplicity and suitable to the condition of Ethiopia
- A **baby trial** consists of a single new variety that is given to the farmer to enable him/her to compare it with his/her own variety. Sufficient seed was given to allow the farmer to plant a relatively big plot so that the comparison can easily be made.

The 'Baby' Trial

- one or two new cultivars per farmer
- compared to local cultivar or second new variety
- farmer managed, farmer inputs
- evaluation of farmer's perceptions

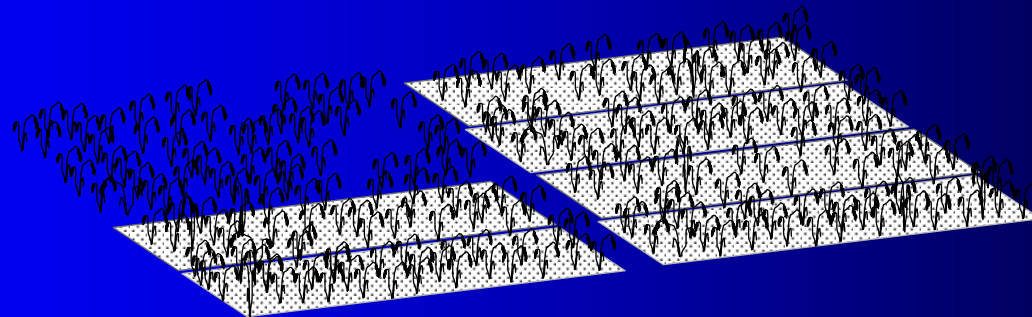


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- In the **mother trial** all new varieties tested in baby trial were grown in as a single replicate in a centrally located villages often with innovative farmers. The varieties comprising the baby trails came from the mother trial. Each mother trial in our case was composed of 4-5 varieties

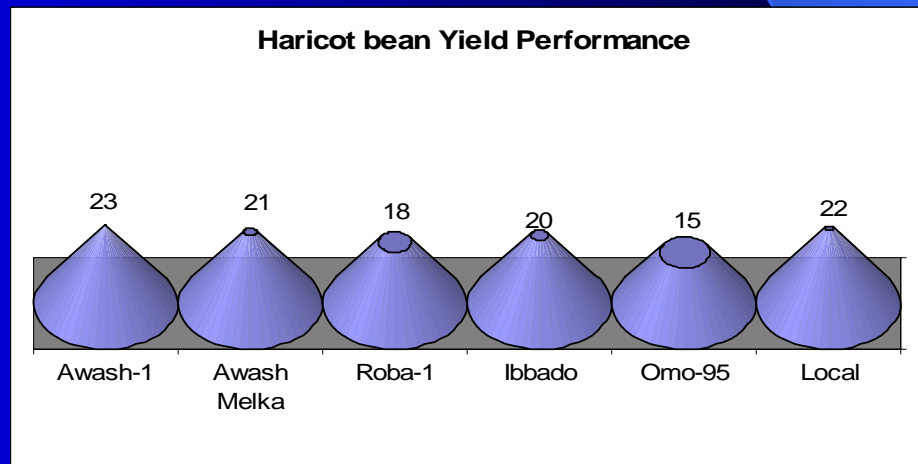
The 'Mother' Trial

- many cultivars, several locations, one replicate per location
- researcher designed, farmer managed, farmer level of inputs
- yield and maturity measured by researchers
- consultative evaluation of other traits



Result and Discussion

- **Haricot bean:** Haricot bean is one of the major grain legumes widely cultivated by smallholder farmers in SNNPR. The farmers are using the crop for home consumption and income generation
- Only a single variety has shown a yield advantage over the local one
- However, farmers employed a number of parameters to select their preferred Variety



Farmers preference ranking

Parameters	Varieties					
	Awash 1	Awash Melka	Roba - 1	Ibbado	Omo-95	Local
Seed colour	1	3	5	2	6	4
Seed size	2	3	5	1	6	4
Earliness	4	5	2	1	5	3
Market demand	1	2	5	3	4	4
Yield	1	2	5	3	6	3
Overall score	1.8	3	4.4	2	5.4	3.6
Rank	1	3	5	2	6	4

Farmers preference ranking, *Key for scale (1-6); 1= best, 6= least*

Farmers selected Awash-1 and Ibbado because of their market and best food value respectively

Soybean

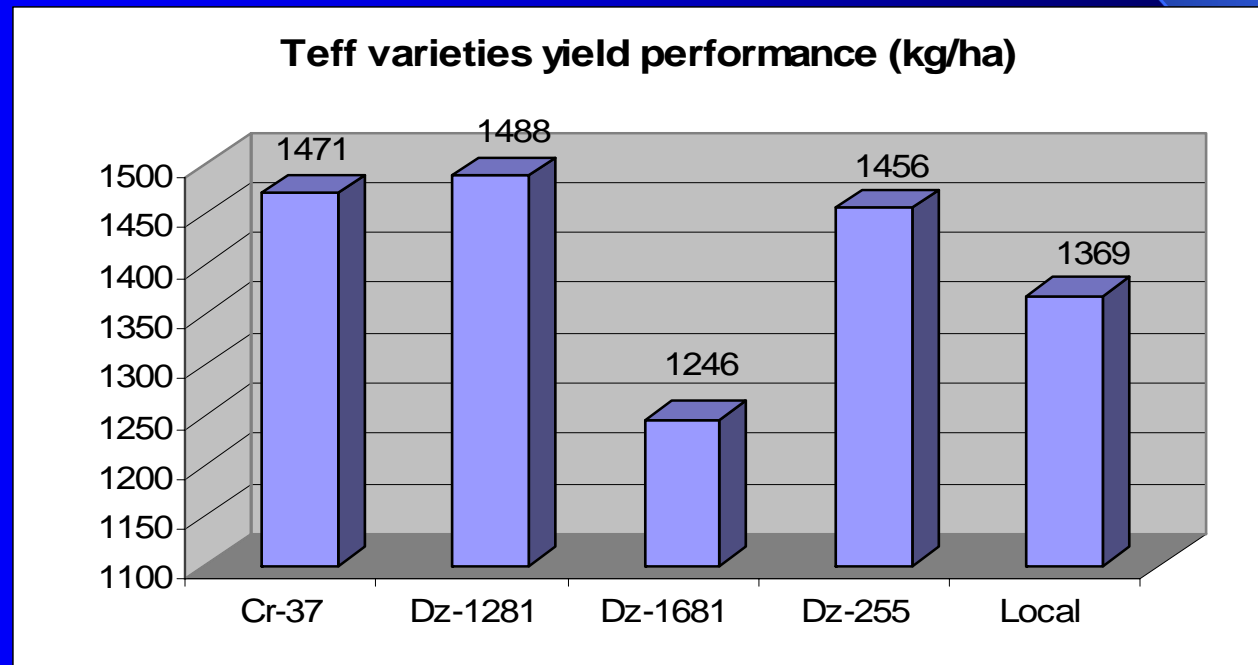
- Soybean is a newly introduced crop in the region and its production is not as such intensive among smallholder farmers. Awassa Agricultural Research Centre has recently released seven varieties for production. In operational research only the three varieties were selected for PVS due to their earliness.

Soybean varieties yield performance (kg/ha)

Varieties	Locations			Mean	Rank
	Awassa Zuria Woreda	Boricha Woreda	Meskan Woreda		
Awassa 95	1981.0	1855.5	1050.0	1628.8	2
Crowford	1881.8	1956.5	1168.0	1668.8	1
William	1950.8	1431.8	1001.8	1461.4	3

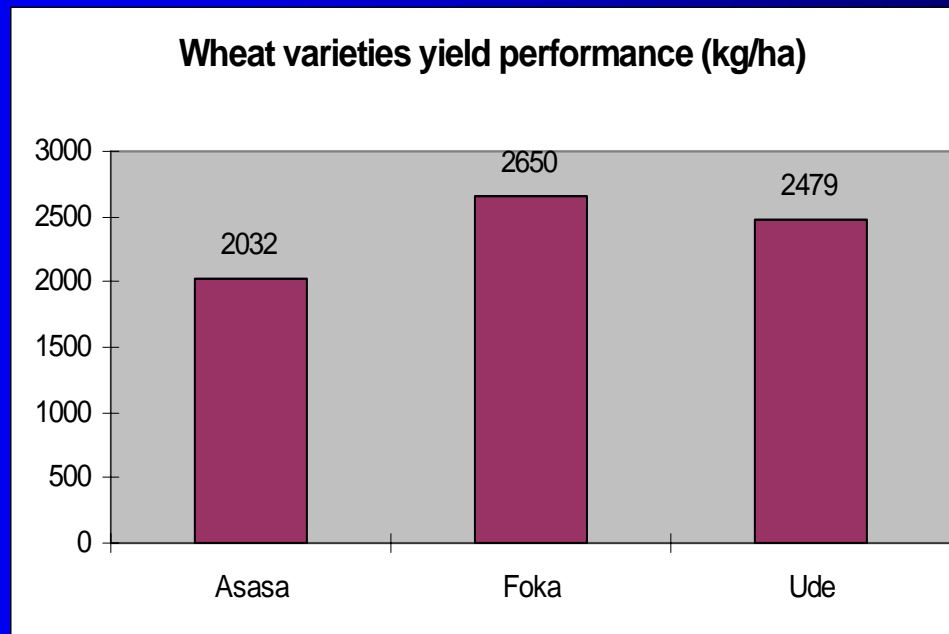
Teff

- Except one variety (i.e. Dz-1681) all improved varieties showed yield advantage over the local varieties. As a result farmers in both woredas selected Dz-1281 and Cr-37 for seed multiplication.



Wheat

- The wheat varieties were introduced only in Meskan woreda due to its agro-ecological suitability. All the varieties are durum wheat and they have shown better yield performance.

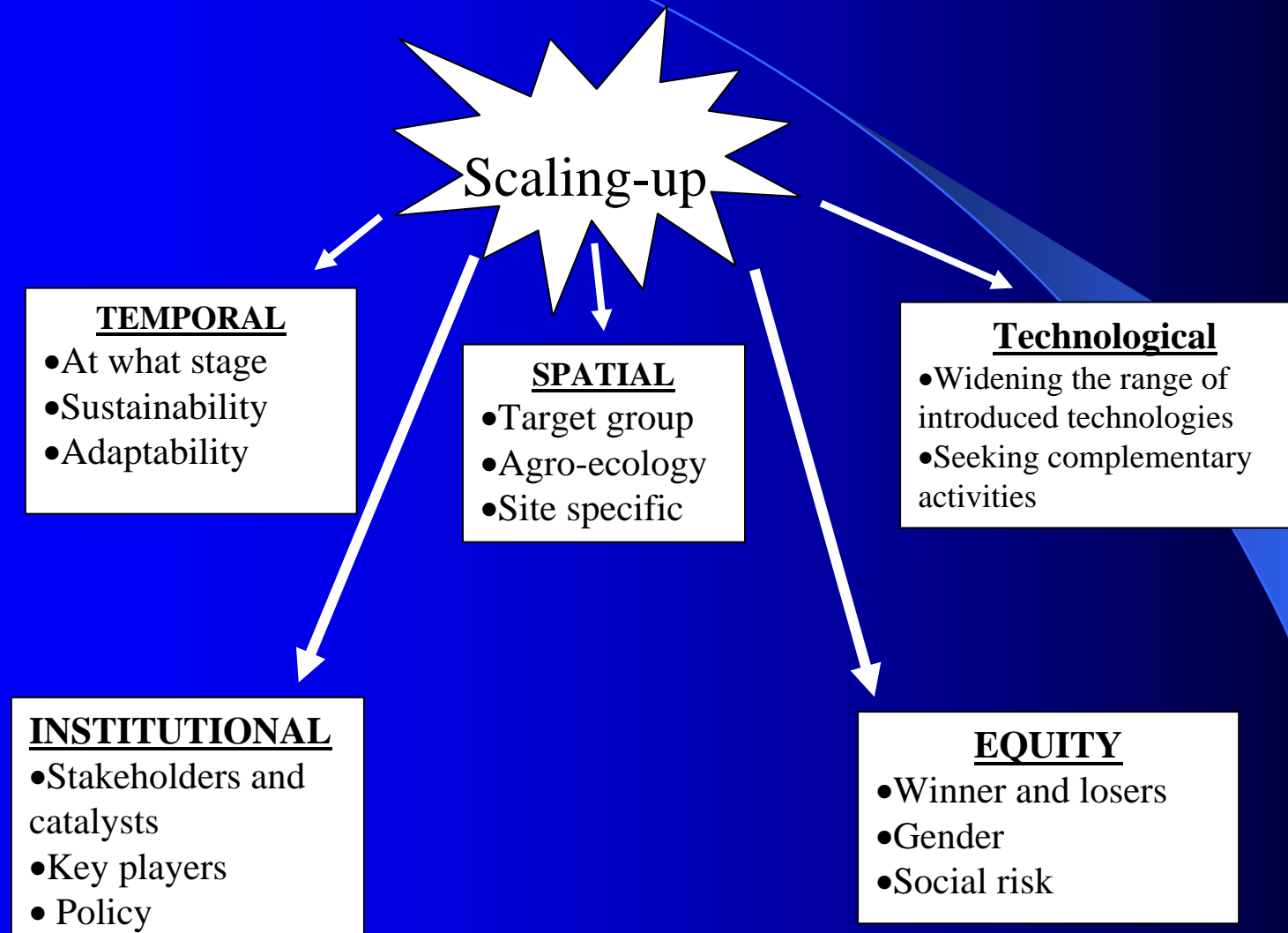


Farmers selected Ude and Foka variety for seed production.

Scaling-up

- Scaling-up of process, innovations and products have a significant contribution to institutional development, biodiversity and farmers livelihood.
- Scaling-up is a process of reaching large number of people. Specific innovation and methodologies accepted by conventional research, development and policy framework should be scaled up.

Scaling-up framework



Scaling-up in operational research

- Community based seed production scheme
 - Local seed production scheme should be seen in the context of enhances linkage among research-development continuum stakeholders
 - The FRG organized at PA level has taken the responsibility for **starter seed multiplication**; and at the moment seed increase work has been done on **two varieties of haricot bean, wheat and teff and on three varieties of soybean.**
 - This year the FRG groups are up-graded into community based seed production organization and currently it has 50 members in each woreda

Issues in community-based seed production

- 1. Choice of crop(s) and variety
- 2. Source of seed
- 3. Training of seed producers
- 4. Quality control/inspection
- 5. Need for credit to produce the seeds
- 6. Cleaning, packaging, and marketing of seed
- 7. Sustainability issues

Community-based production scheme framework

