

Policy Training Program



The International Treaty
ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE





Research Focus:

Using rice genetic diversity to support farmers' adaptation to climate change for sustainable production and improved livelihoods in India

Objectives


- Exploring means for strengthening link between national and community gene banks and local farmers in the context of adaptation to climate risks
- Understanding social and cultural barriers to adoption of adapted varieties and explore effective means of introducing new adapted plant genetic resources
- Understanding the role of national and local seed systems in enabling adaptation under changing production constraints
- Strengthening capacity of local institutions and farmers for climate variation adaptation and conservation of crop diversity
- Setting up community based gene banks and information dissemination systems.


Project Outcomes

Outcome 1. Farmers' will have increased access to rice genetic diversity, climate information and stake their claim for equitable sharing of benefits

Activities:

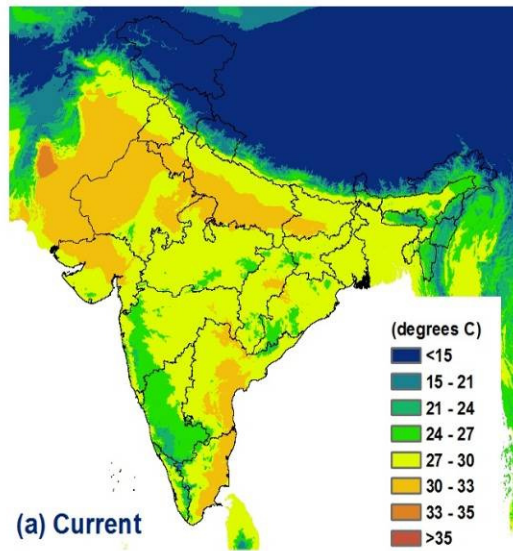
- a) Evaluated current and future rice production potential sites using GIS based prediction models
- b) Selected pilot sites based on major discrepancies between current and projected future production potential.

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- c) Compiled and synthesised information for characterization and evaluation of existing diversity to adapt to climatic variations.
 - d) Characterized farmer varieties with climate resilient traits for registration with PVA.
 - e) Developed rice cultivation suitability models to allow identification of gene bank materials best suited to changing environmental conditions.
 - f) Documented information on the identified accessions.

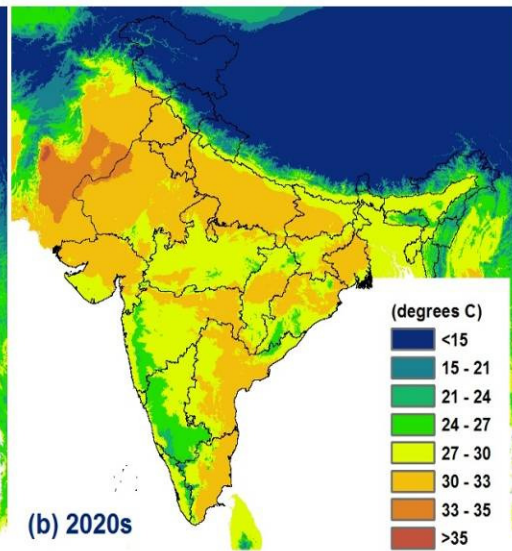
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- With GIS based prediction models, areas vulnerable to climate change have been identified.
 - This will help the farmers to understand which collection will be most useful for them under predicted climate change scenarios

As can be seen from the maps:

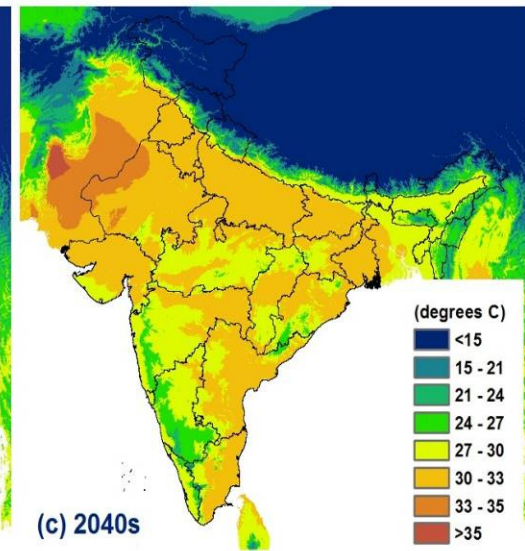
- Areas along Bihar, Jharkhand, Chhattisgarh and Odisha shows an increase in temperature from current to future conditions
- Areas where the states of Bihar, Jharkhand and Chhattisgarh adjoins and southern Chhattisgarh show a change in the precipitation from current to future conditions



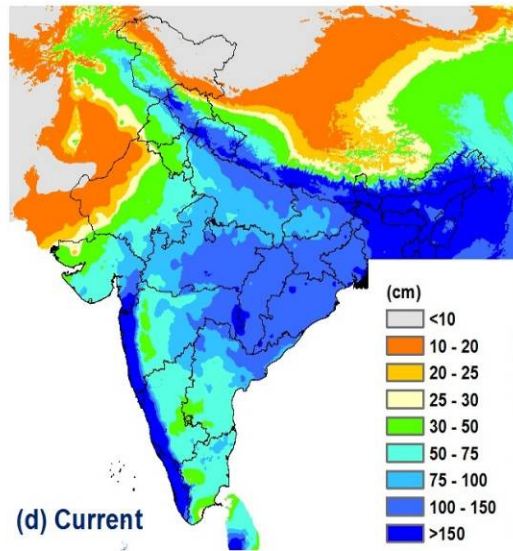
(a) Current



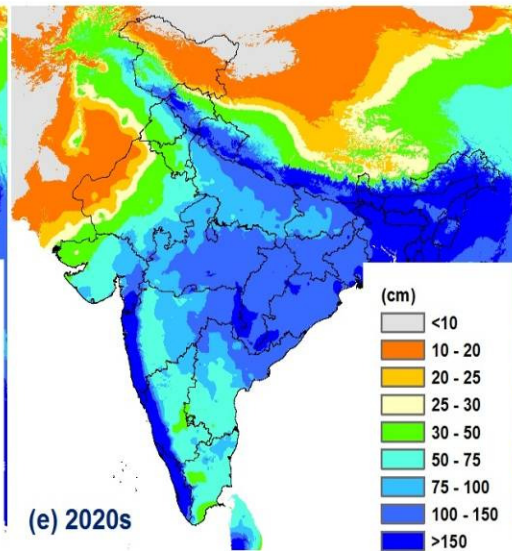
(b) 2020s



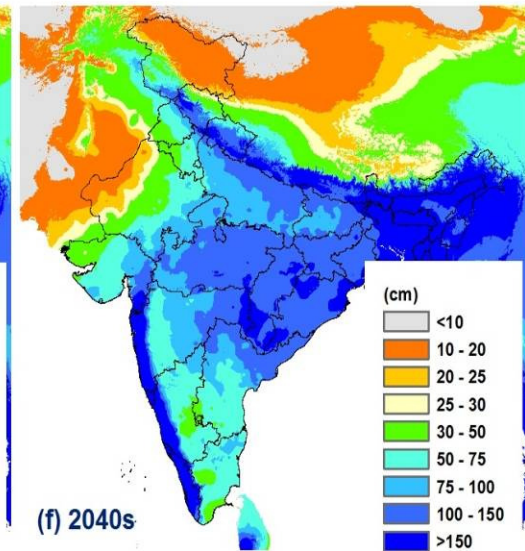
(c) 2040s



(d) Current



(e) 2020s



(f) 2040s

Mean temperature for (a) current, (b) 2020s and (c) 2040s and mean precipitation for (a) current, (b) 2020s and (c) 2040s for April to October

Outcome 2: Agricultural systems will be more resilient to climate change.

Activities:

- a) On-farm trials were undertaken to identify varieties/landraces suitable for climatic variations.
- b) Initiated participatory variety selection (PVS) programmes based on farmers' preferences to adapt to climatic variation.
- c) Developed user friendly communication tools for researchers and farmers



Installation of i-button at PVS trials in Himachal Pradesh

- Participatory Varietal Trials (PVS) trials were conducted at all sites with weather data incorporated using iButton technology.
- These climate buttons recorded the temperature and moisture level.
- This will help Gene Campaign to provide the seeds suitable to the local climatic conditions of the area in the future
- It will also enable the farmers to have the knowledge of the varieties which are most resilient to the changing climatic conditions.



Training farmers in database management



Outcome 3: Small and marginal farmers will be better able to use adapted genetic materials through an improved local seed system network.

Activities:

- a) Undertook household surveys to document indigenous knowledge about climate change and local seed systems.
- b) Collected local rice germplasm and established community seed banks.
- c) Gathered information and established database at each project site.
- d) Organized seed diversity fairs.

- e) Developed/strengthened local seed-distribution systems.
- f) Planned for multiplication of adapted crop diversity for distribution in future.



Seed Diversity Fair, Uttar Pradesh



Seed Diversity Fair, Uttarakhand

- Seed diversity fair in Uttar Pradesh proved to be an important platform for farmers to exchange seeds and traditional knowledge with each other.
- The three farmers Rajendra, Basmati and Toofani live in the same village and are custodian of three different traditional paddy varieties.
- However, they didn't know the other one also cultivated traditional varieties.
- Farmer Toofani said, *“I had been looking for Kalanamak seeds for my farm but was not able to find them. However, thanks to the Beej mela organized by Gene Campaign I got its seeds from farmer Rajendra who lives in my village.”*



Farmers Rajendra, Basmati and Toofani talking about kalanamak seeds

Kalanamak seeds



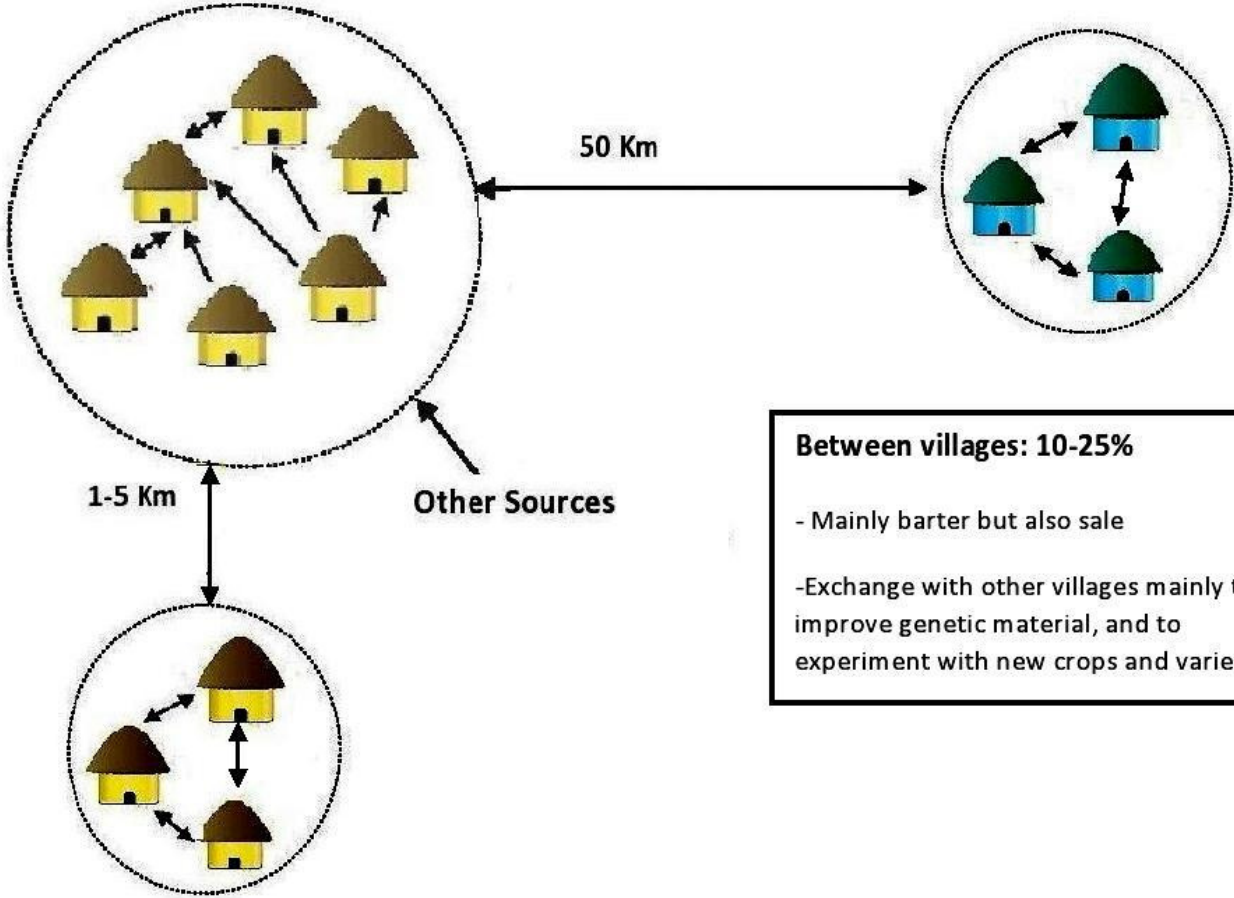


During the seed system study in Bihar and Uttarakhand, it was noticed:

- In past, within village, 50-90% of the households saved their seeds in Bihar and 80-100% saved theirs in Uttarakhand
- However in the present, farm saved seeds have reduced to only 10% whereas almost 50-70% households are now buying their seeds from the market in Bihar.
- In Uttarakhand the scenario is entirely different: farm-saved seeds still constitute 75-90% of the seed system and only 5-10% of the households are dependent on the market for the seeds.

Within village

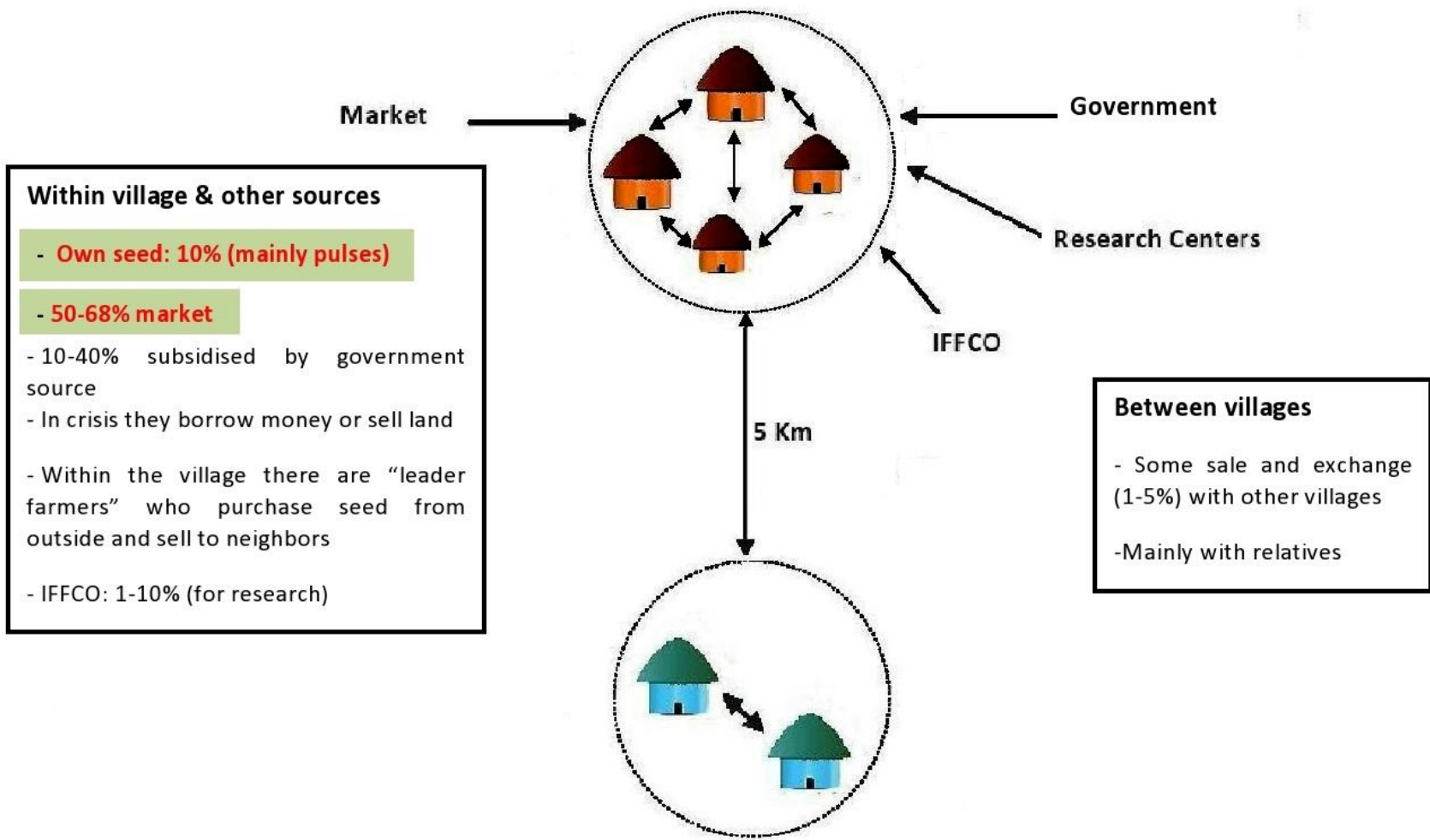
- Own seed: 50- 90%
- Exchange within the village with relatives and neighbors (barter and sale)



Between villages: 10-25%

- Mainly barter but also sale
- Exchange with other villages mainly to improve genetic material, and to experiment with new crops and varieties

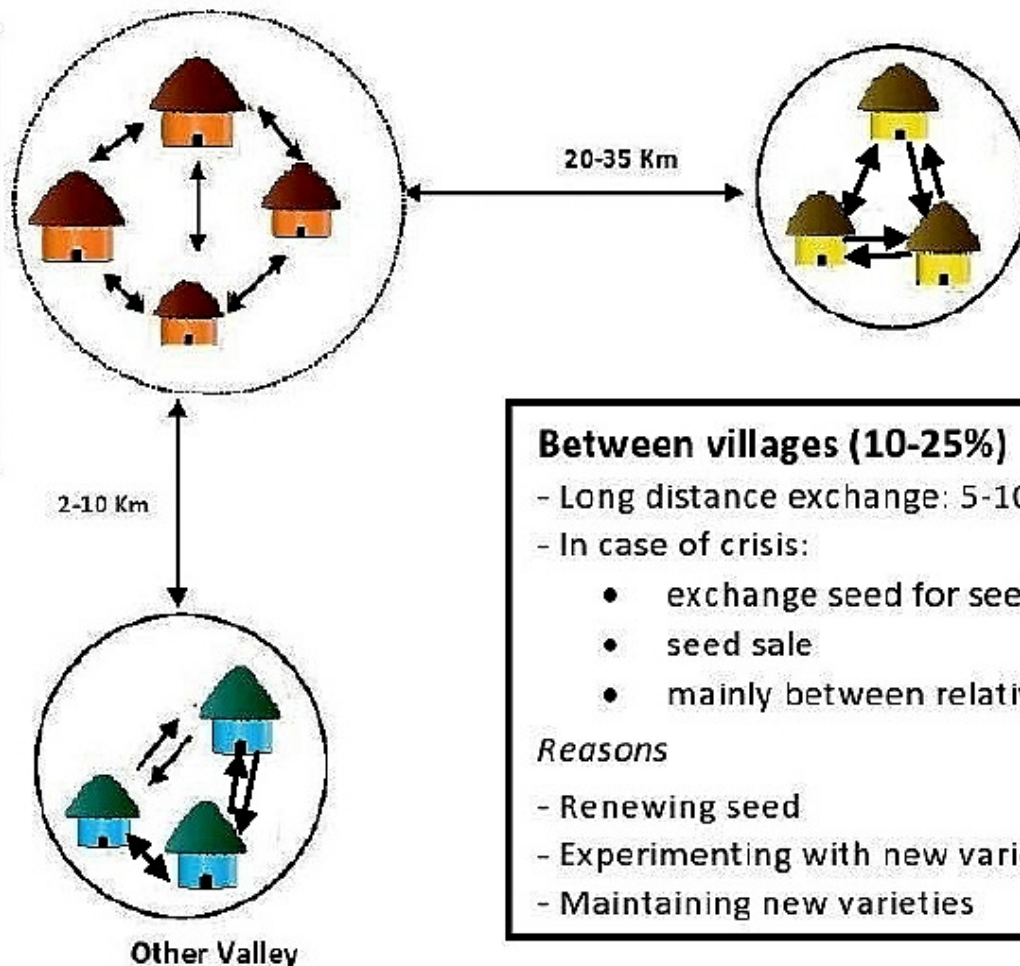
Seed system in past in Bihar



Seed system in present in Bihar

Within village

- Farm saved seeds: 80-100%
- Exchange between relatives and neighbors
- Barter, markets/gifts



Between villages (10-25%)

- Long distance exchange: 5-10%
- In case of crisis:
 - exchange seed for seed, gifts
 - seed sale
 - mainly between relatives

Reasons

- Renewing seed
- Experimenting with new varieties
- Maintaining new varieties

Seed system in past in Uttarakhand

Within village and other sources

- Farm saved seeds: 75-90%

- Less exchange than before

- Government: 5-20%

- Market: 5-10%

- NGO: 0-5%

- In crisis:

- 1st source-neighbors
- 2nd source-other villages
- 3rd source- NGOs, market and government

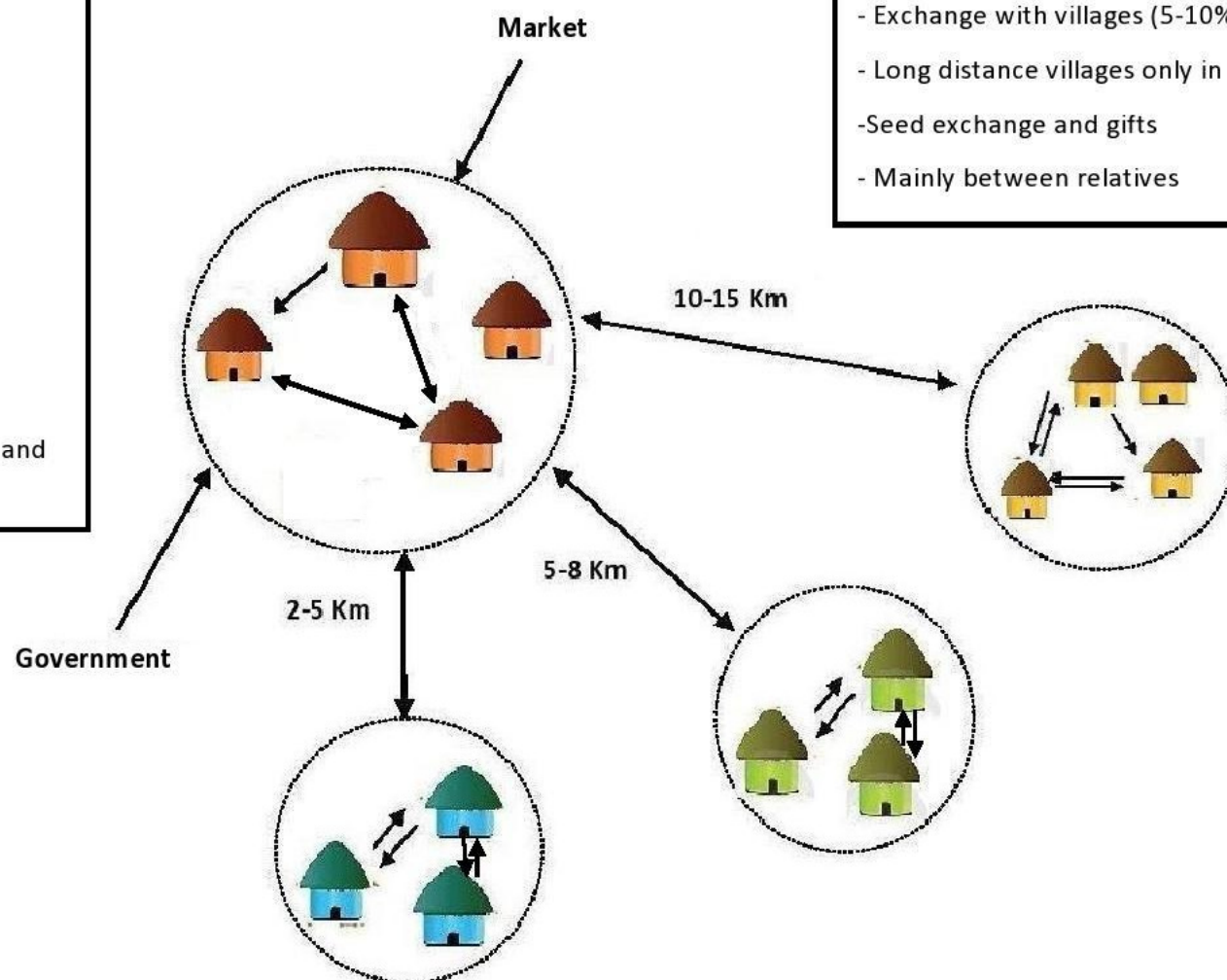
Between villages

- Exchange with villages (5-10%)

- Long distance villages only in crisis

- Seed exchange and gifts

- Mainly between relatives



Seed system in present in
Uttarakhand

The climate change perception study in Uttarakhand provided us with some interesting facts:

- The changes in the usual weather pattern are being felt by almost all the farmers and they appeared to be aware of climate change resilient varieties and crops
- Irrespective of their age, social category, educational levels and genders farmers considered finger millet (locally known as Madua) the most climate change resilient crop cultivated in the area.
- However, it has fast become unpopular for cultivation
- In contrast, although they consider vegetables such as tomato, peas, cabbage, cauliflower chilies, potato, capsicum as the most vulnerable to climatic changes, farmers are relying heavily on them because of the importance of these crops for food and income generation.



Diversity of finger millet in Uttarakhand

Community Seed Banks



Bihar



Himachal Pradesh



Uttar
Pradesh

Master seed bank-Uttarakhand





Outcome 4: Stakeholders' capacities and skills strengthened for identifying and utilizing suitable genetic material for changing climate conditions.

Activities:

- Organized training programmes for researchers in the use of germplasm characterization, trait specific evaluation; GIS tools, climate simulation modelling.
- Training for farmers, extension workers and communities for participatory plant variety selections.
- Exchange visits of progressive farmers across project sites.

- Established for Farmers' Field Schools for training of local communities on conservation and use of crop diversity.
- Workshops/training programmes for policy makers at national and local levels.
- Organized policy dialogues for climate adaptation.



GIS training workshop, New Delhi



Farmer Field School at Uttarakhand



Farmer Field School, Bihar



Thank you