SEEDS FOR NEEDS - INDIA

Broadening the genetic base of crops to empower farmers for climate change adaptation through crowdsourcing

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Farmers' Field Day, Bihar, March 2014

Farmers evaluating varieties

Bioversity team visiting sites in Bihar

Women farmers with crowdsourcing packets

Crowdsourcing packets

How can agricultural biodiversity help minimize the risks associated with climate change?

THE APPROACH:

1. Expose farmers to more crops and their varieties and increase their first-hand knowledge about different traits and options available
2. Strengthen their seed systems and seed-saving capacity so that they always have access to planting material that fits their changing needs.

ESTABLISHMENT OF FARMER-BASED EXPERIMENTAL NETWORK

OBSERVATIONS

- Farmers provided with different varieties which they evaluated in their own farm
- Most of these varieties performed better than varieties which were previously cultivated
- Farmers are willing to grow selected varieties for further testing for large scale cultivation
- Farmers have better understanding on use of diversity for climate risk adaptation - willing to grow more varieties

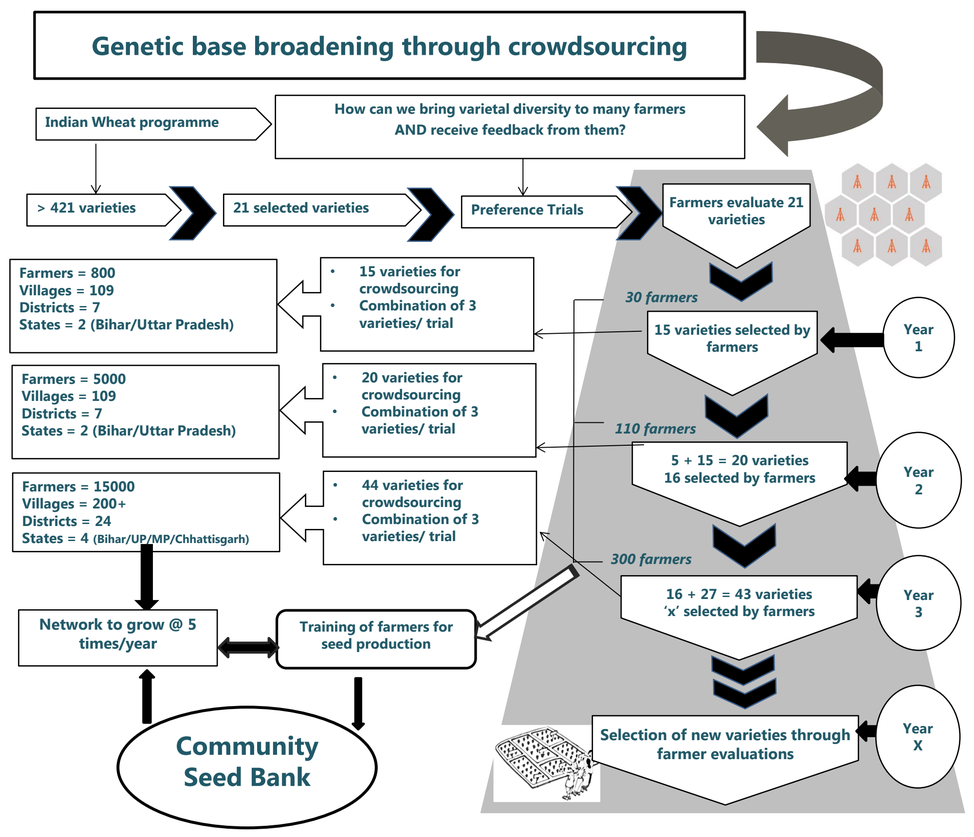
OUTCOMES

- Farmers' network established and growing – Crowdsourcing Crop Improvement Programme
- Farmers are willing to take up programme on Seed Production
- Farmers willing to set up local seed system - Community Seed Banks

➡ Ultimately lead to a Citizen Science Approach

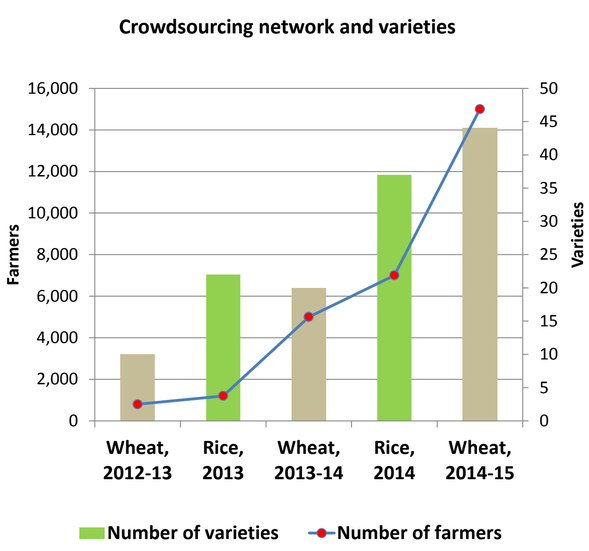
UPSCALING ON-FARM ACTIVITIES

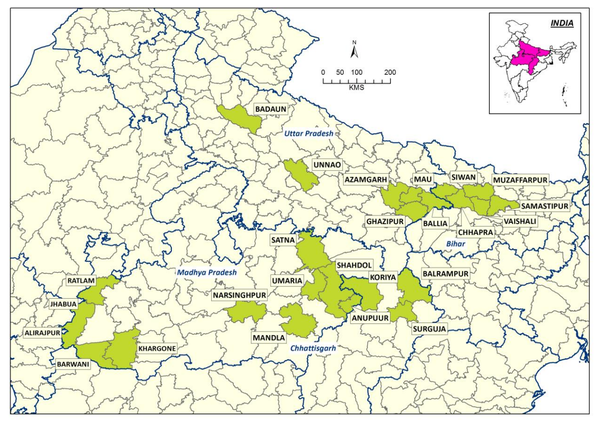
Can Crowd-Sourced Crop Improvement Programme Reduce the Vulnerability of Local Seed Systems to Climate Change?



RESULTS

- Farmers' network expanded from 30 to 15,000 farmers over 3 years
- Yields obtained from trials comparatively higher than the existing averages
- Farmers' awareness of need for diverse good quality seeds increased
- Groups of farmers have initiated the process of seed multiplication and setting up community seed banks





Crowdsourcing sites have increased from 7 to 24 districts and now cover the 4 states of Bihar, Uttar Pradesh, Madhya Pradesh and Chhattisgarh.

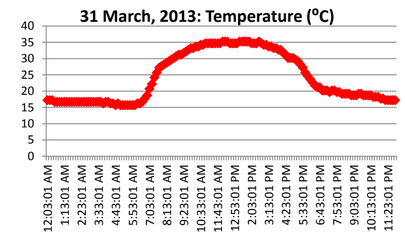
INNOVATIVE TECHNOLOGIES TO CAPTURE CLIMATE PATTERNS AND TRENDS FOR CLIMATE CHANGE ADAPTATION

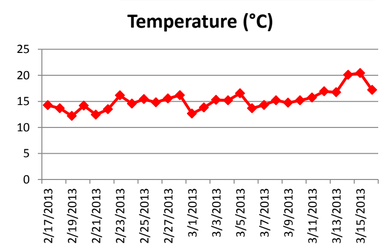
Day/Time	Temp °C	RH %
3/31/2013 0:03	17.166	87.19
3/31/2013 0:13	17.166	88.81
3/31/2013 0:23	17.166	89.35
3/31/2013 0:33	16.665	90.43
3/31/2013 0:43	16.665	90.43
3/31/2013 0:53	16.665	89.89
3/31/2013 1:03	16.665	91.49
3/31/2013 1:13	16.665	92.03
3/31/2013 1:23	16.665	92.03
3/31/2013 1:33	16.665	92.03
3/31/2013 1:43	16.665	92.56
3/31/2013 1:53	16.665	94.15
3/31/2013 2:03	16.665	93.62
3/31/2013 2:13	16.665	93.09
3/31/2013 2:23	16.665	90.96
3/31/2013 2:33	16.665	92.03
3/31/2013 2:43	16.665	91.49

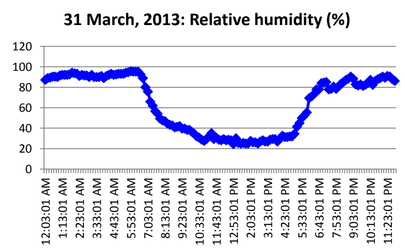
10 minute interval data

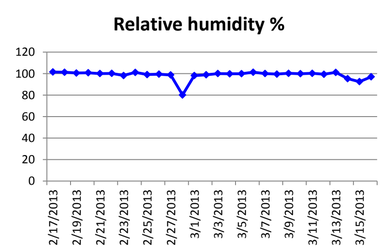
Day	Temp °C	RH %
2/17/2013	14.256	101.544
2/18/2013	13.660	101.320
2/19/2013	12.181	100.577
2/20/2013	14.173	100.808
2/21/2013	12.440	100.051
2/22/2013	13.479	100.171
2/23/2013	16.134	98.261
2/24/2013	14.568	101.182
2/25/2013	15.412	99.140
2/26/2013	14.806	99.479
2/27/2013	15.546	98.729
2/28/2013	16.173	80.093
3/1/2013	12.634	98.142
3/2/2013	13.819	98.890
3/3/2013	15.277	100.066
3/4/2013	15.188	99.819

Daily data - average









- Micro-weather recording devices - iButtons installed across all crowdsourcing trial sites
- Records temperature and humidity at any given time interval
- iButtons are mounted on specially designed stands made of PVC pipes
- Data is downloaded from the iButtons onto portable recorders from the fields

FUTURE PLANS

- Farmers have already become 'citizen crop scientists' providing feedback on their preference ranking data
- Project aims to upscale the farmers' network to 30,000 farmers in the next 2 years
- Also aims to generate an ICT-based system to improve farmers' decision-making process for seeds and meteorological information
- In process of developing technologies (with partners) for
  1. Bespoke Apps for mobile phone
  2. Application Programme Interface (APIs) and online databases
  3. Interactive voice response (IVR) system
  4. Environmental sensors (e.g., iButtons, or Wimotosensors)

RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

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