



INTERNATIONAL FOOD
POLICY RESEARCH INSTITUTE
sustainable solutions for ending hunger and poverty
Supported by the CGIAR

Investigating Farmers' Choice of Pearl Millet Varieties in India:

Modalities of Multi-Stakeholder Data Collection

Dorene Asare-Marfo, Ekin Birol and Devesh Roy

BIOFORTIFICATION AND HARVESTPLUS

- Biofortification - breeding staple food crops that have high micronutrient content.
- Could prove to be an essential strategy in combating micronutrient malnutrition.
- HarvestPlus (CGIAR Challenge Program), following WHO critical nutrients – Vitamin A, Zinc and Iron – to breed biofortified wheat, beans, rice, pearl millet, sweet potato, maize cassava in seven developing countries
- <http://www.harvestplus.org/>

BIOFORTIFICATION OF PEARL MILLET - INDIA

- ICRISAT Scientists and HarvestPlus currently breeding iron-rich varieties of pearl millet (or *bajra*) in India
- For dissemination in late 2011

BUT...

1. Biofortification may alter preexisting favorable traits which are of value to both consumers (e.g. taste, roti quality) and producers (e.g. yield) and;
2. Adoption of biofortified varieties may depend on institutional and structural factors such as social networks and market structure of seed systems.

THEREFORE...

OBJECTIVES OF THE STUDY

To assess:

1. the popular varieties of pearl millet cultivated in India;
 2. contributing factors to popularity of pearl millet varieties and farmers' choice of varieties;
 3. farmers' sources of pearl millet seeds;
 4. farmers' sources of information on new farming technologies.
- ... in order to determine the likelihood of adoption of biofortified pearl millet among farmers.

VARIETAL ADOPTION IS A COMPLEX PROCESS...

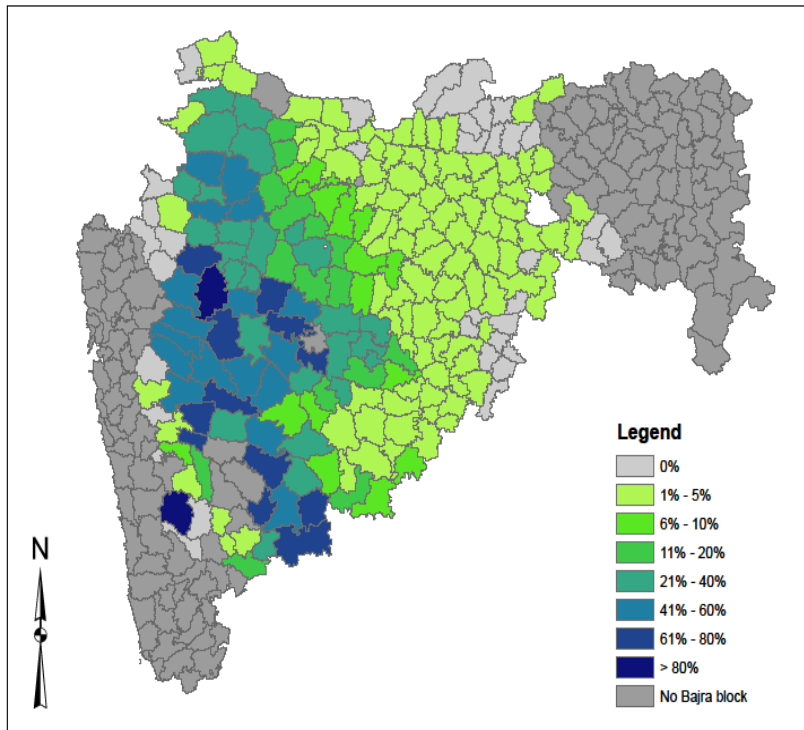
- Multi-stakeholder – 4 identified key actors in pearl millet supply chain:
 - Farmers
 - Agricultural/extension Officers
 - Agri-input/seed suppliers
 - Seed companies
- Multi-dimensional
 - 2 popular pearl millet producing states: Maharashtra & Rajasthan
 - varying degree of information needs for each actor
- Limited time frame and limited resources

... NEED FOR CUTTING-EDGE, INNOVATIVE DATA COLLECTION (FOR VARIOUS SUPPLY CHAIN ACTORS)

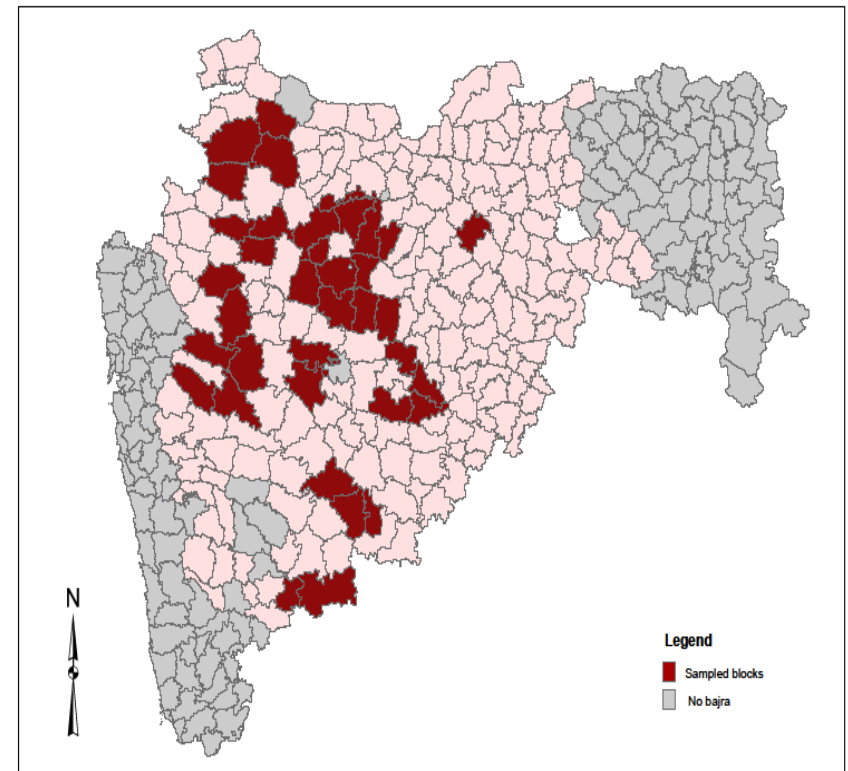
Pearl millet seed supply chain actor	Data collection technique employed	Sample size sampled	Intensive margin	Extensive margin
Farmers	Computer assisted personal interviews (CAPI)	4213	High	Medium
Extension/agricultural officer	Pen and paper interviews (PAPI)	99	Low	Medium
Agri-input/seed suppliers	Computer assisted telephone interviews (CATI)	932	Low	High
Seed companies	Web-based survey	(ongoing)	Low	High

MAHARASHTRA

Share of agricultural land area dedicated to pearl millet production

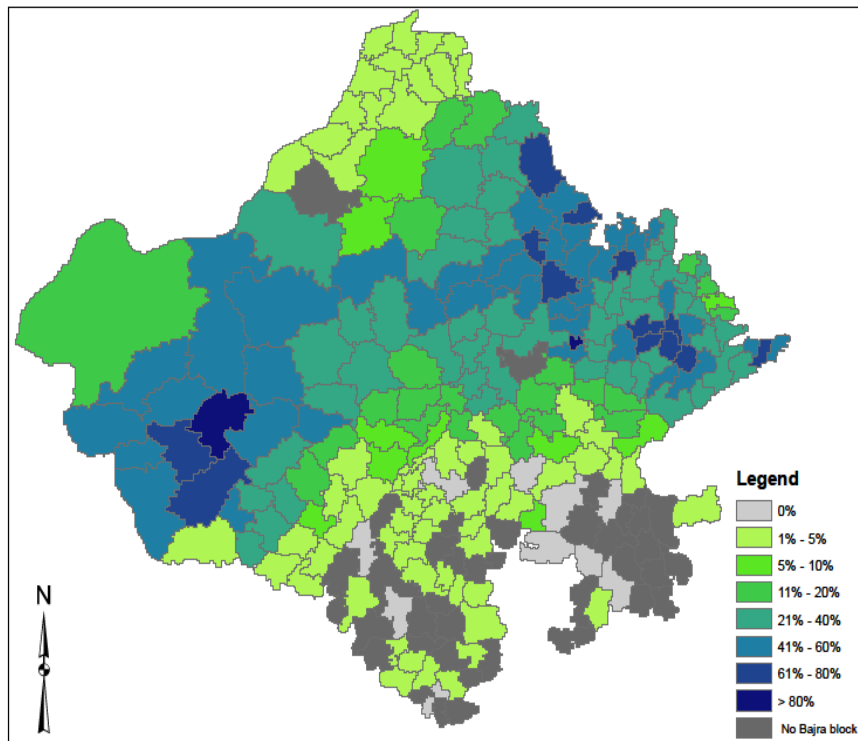


Sampled Blocks

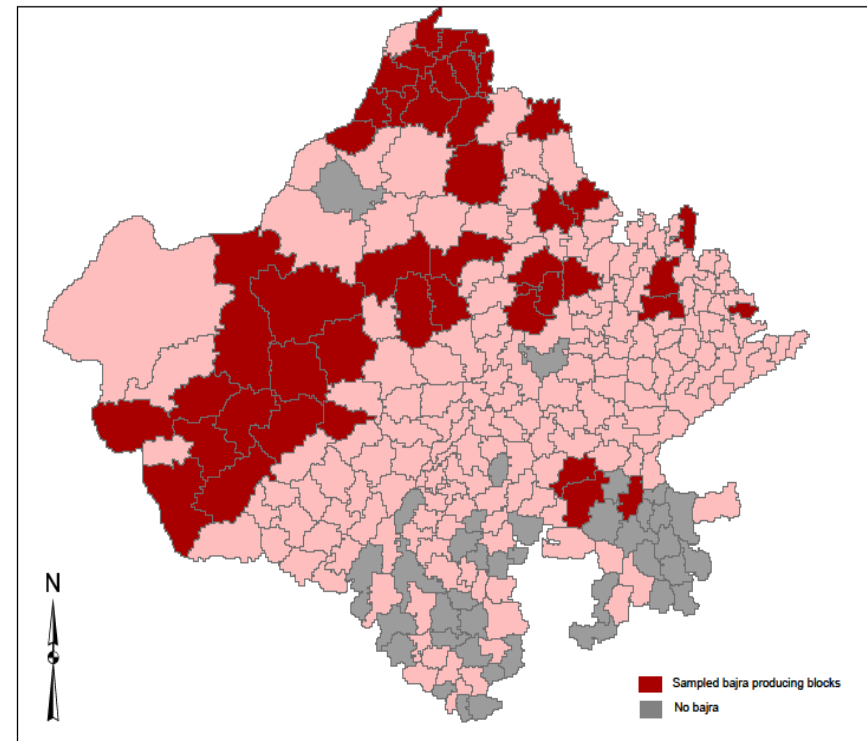


RAJASTHAN

Share of agricultural land area
dedicated to pearl millet production



Sampled Blocks



Farm Household Survey - CAPI

- Farmers are primary targets for dissemination – need detailed information
- High intensive margin
 - Detailed information with need for data validation and accurate data entry
- High extensive margin
 - 2144 farmers in 38 of 184 blocks in Maharashtra
 - 2011 farmers in 45 of 215 blocks in Rajasthan



Pros and Cons of CAPI

Pros	Cons
1. Minimal errors from consistency and validation checking (in comparison to PAPI)	1. Requires THOROUGH planning and development as well as ample time (for programming and training)
2. Real-time monitoring of data collection further minimizes error	2. May be costly <i>at face value</i> (e.g. equipment, programming, training)
3. Compact and portable: less cumbersome to move around with compared to PAPI	3. Need for additional equipment (laptops) – for frequent downloading of data
4. Additional technology to aid with data collection, e.g. GPS, photos, voice recording	4. Consistent electric supply needed to recharge PDAs – particularly challenging in rural/remote areas
5. Positive response from both enumerators and respondents	
6. Ease in asking complex questions with loops and skip patterns.	
E.g. social networks module	

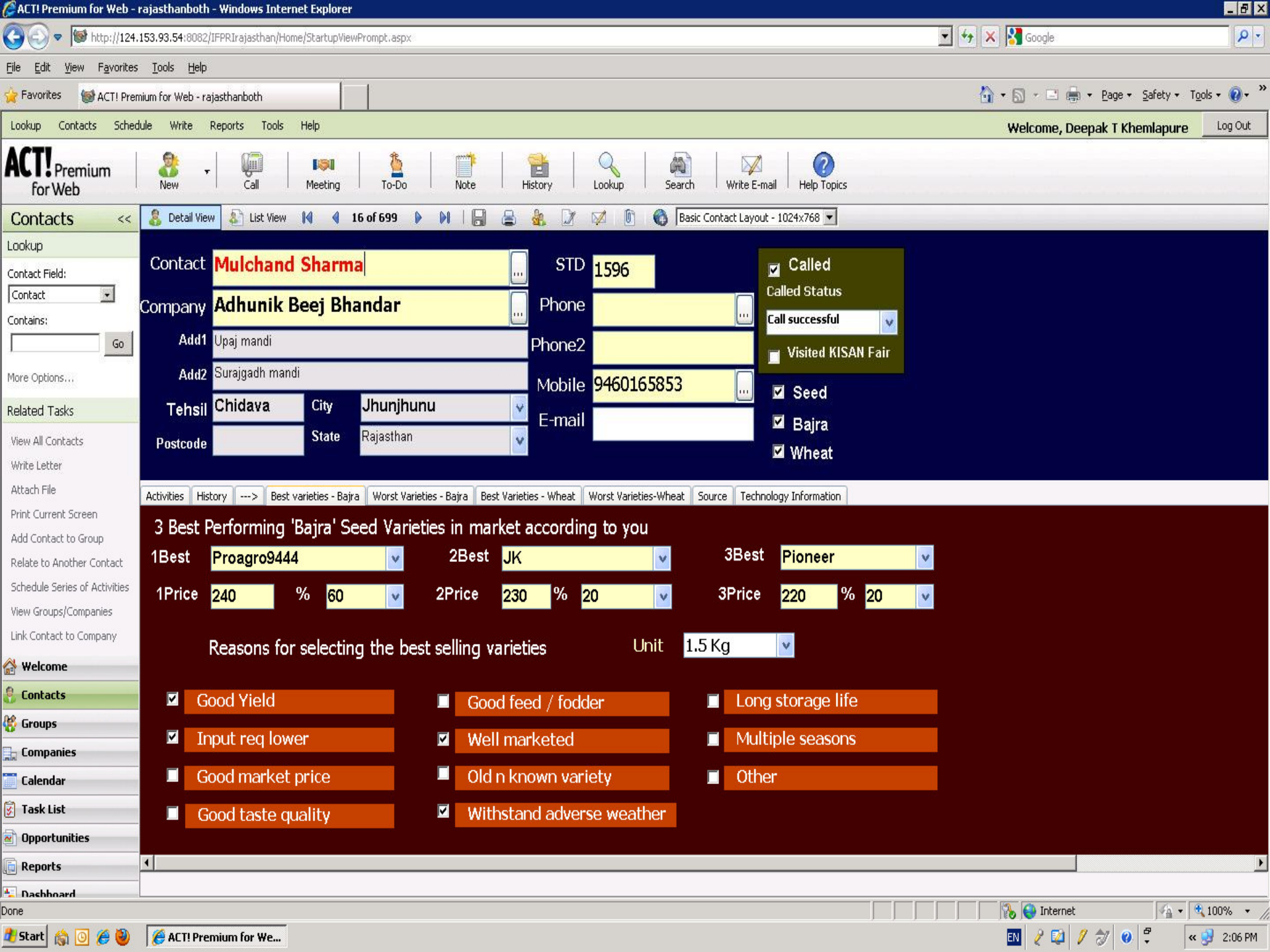
Recommendations for effective CAPI

1. Researcher and programmer should understand and eventually “speak” each other’s language.
 - Be cognizant of each party’s demands and limitations
2. “Lock” questionnaire (i.e. finalize design, development and organization) BEFORE handing over to programmer
3. Ideally, the survey should also be programmed in local language
4. Invest ample time in training
 - for questionnaire
 - for looking after PDA devices (emphasize the costly nature of the devices to enumerators)
5. Enumerators should be well educated and computer literate
6. Test the program (and data export program) on the field and off the field THOROUGHLY
7. Insure PDA devices during survey in case of theft or damage

Agri-Input/Seed Supplier Survey - CATI



- Pre-existing database of agri-input suppliers – KISAN
- Small (low) intensive margin
 - basic information, few questions
- High extensive margin
 - Wide geographical spread; reaching suppliers outside our sampling frame for farm household and EAO survey



ACT! Premium for Web
New Call Meeting To-Do Note History Lookup Search Write E-mail Help Topics

Contact Mulchand Sharma
Company Adhunik Beej Bhandar
Address: Upaj mandi, Surajgadh mandi
Tehsil: Chidava, City: Jhunjhunu, State: Rajasthan
Mobile: 9460165853
Called Status: Call successful
Visited: KISAN Fair
Interests: Seed, Bajra, Wheat

3 Best Performing 'Bajra' Seed Varieties in market according to you

Table with 3 columns: Rank, Variety Name, Price, and Percentage.
1Best Proagro9444, Price 240, % 60
2Best JK, Price 230, % 20
3Best Pioneer, Price 220, % 20

Reasons for selecting the best selling varieties Unit 1.5 Kg

- Good Yield, Input req lower, Good market price, Good taste quality, Good feed / fodder, Well marketed, Old n known variety, Withstand adverse weather, Long storage life, Multiple seasons, Other

Pros and Cons of CATI

Pros	Cons
1. Data can be collected and updated in real-time	1. Requires a pre-existing database for respondents. If unavailable, must budget time and funds to collect contact information
2. Respondents can be re-contacted if the need arises (unlike the case of PAPI or CAPI)	2. Language restrictions from one geographical area to another may warrant more enumerators/phone operators than necessary
3. Cost of administration is relatively low	3. Survey cannot be too lengthy and questions should not have multiple answers (to minimize respondent fatigue)
4. Allows for coverage over a greater geographical area	4. Incorrect hearing and misspelling over the phone may introduce some error in data collection
5. Data can be collected over a relatively short period of time	

Recommendations for effective CATI

1. Ensure that a pre-existing database of respondents is available
2. Language of the target region should be studied in advance and relevant words should be known to the agents/enumerators
3. Keep survey succinct in order to keep the respondent's attention and acquire the MOST RELEVANT information from them
4. Ensure that interviewers are well trained and extremely patient and tolerant to deal with rejection and impolite respondents
5. Establish rapport if possible
 - E.g. texting before phone call to inform and again afterwards to show appreciation

Seed Company Survey – Web-based

- Seed company managers/CEOs were assumed to be computer literate.
 - therefore self-administered survey
- High extensive margin
 - nationwide coverage
- Low intensive margin
 - basic information requirements and few questions

Pros and Cons of Web-based surveys

Pros	Cons
1. Cost of administration is low (sometimes non-existent)	1. Requires a pre-existing database for respondents. If unavailable, must budget time to gather respondents' email addresses
2. Responses can be accessed and assessed in real time	2. SPAM – email may never reach the respondents
3. Allows for greater geographical coverage – wherever internet access is available	3. Response rate tends to be low especially in locations where internet is accessed less frequently
	4. Respondents must be computer literate

Recommendations:

1. Participation (and better response rate) can be further encouraged by using an authoritative local figure to send out the email
2. Send frequent reminders to encourage participation.

Key Findings and Importance of Data Triangulation: Example from Maharashtra

Rank	Farmers	EAO	Agri-input*
1	Mahyco 204	Mahabeej ICTP 8203	Mahyco 204
2	Pioneer 86M32	Mahyco 204	Pioneer 86M32
3	Mahyco 2210	Mahabeej Shradha 8609	Nirmal 9
4	Nirmal 9	Pioneer 86M32	Mahyco 2210
5	Mahalaxmi 308	Mahabeej Saburi	Nirmal Tulja 1579

- Congruence between Agri-input and farmers - credibility to data collection (60% of farmers indicate agri-input suppliers are main sources of procurement)
- Farm household survey sample is representative or pearl millet producing areas
- EAOs may be detached from realities on the field and their interaction with farmers could be minimal/self selected that grow varieties of the public sector

Key Findings and Importance of Data Triangulation: General

	MAHARASHTRA	RAJASTHAN
Popular Varieties grown are...	Hybrid seeds/improved varieties	Local varieties
Purchase seeds from...	Agri-input suppliers – 60%	Agri-input suppliers (IF at all purchased) – 70%
Obtain information from...	Private sector agents (agri-input suppliers and agri-exhibitions) and social networks – 71%	Public sector agents and social networks – 97%
Seed replacement is...	More frequent (2 yrs)	Less frequent (5yrs hybrid, 17yrs local)

- Share of local varieties in Rajasthan in relation to Maharashtra calls for reorienting the traditional question of technology adoption as a choice between hybrid vs. non-hybrid seeds (as in Rajasthan) to choice among hybrids (as in Maharashtra).
- Stronger efforts in introducing and diffusing biofortified varieties are required in Rajasthan

Concluding Remarks

- Need for cross-cutting innovative data collection techniques mandated (ex-ante) by multi-stakeholder and multi-dimensional nature of study
- Vindicated ex-post through triangulation of findings
- Trade-off: extensive and intensive margins
- High intensive margins require stronger validation checking

Best practices exist BUT should be tailored to fit the context-specific needs of your study!