Innovative use of mobile phone based applications in tracking adoption of NRM Technologies in India
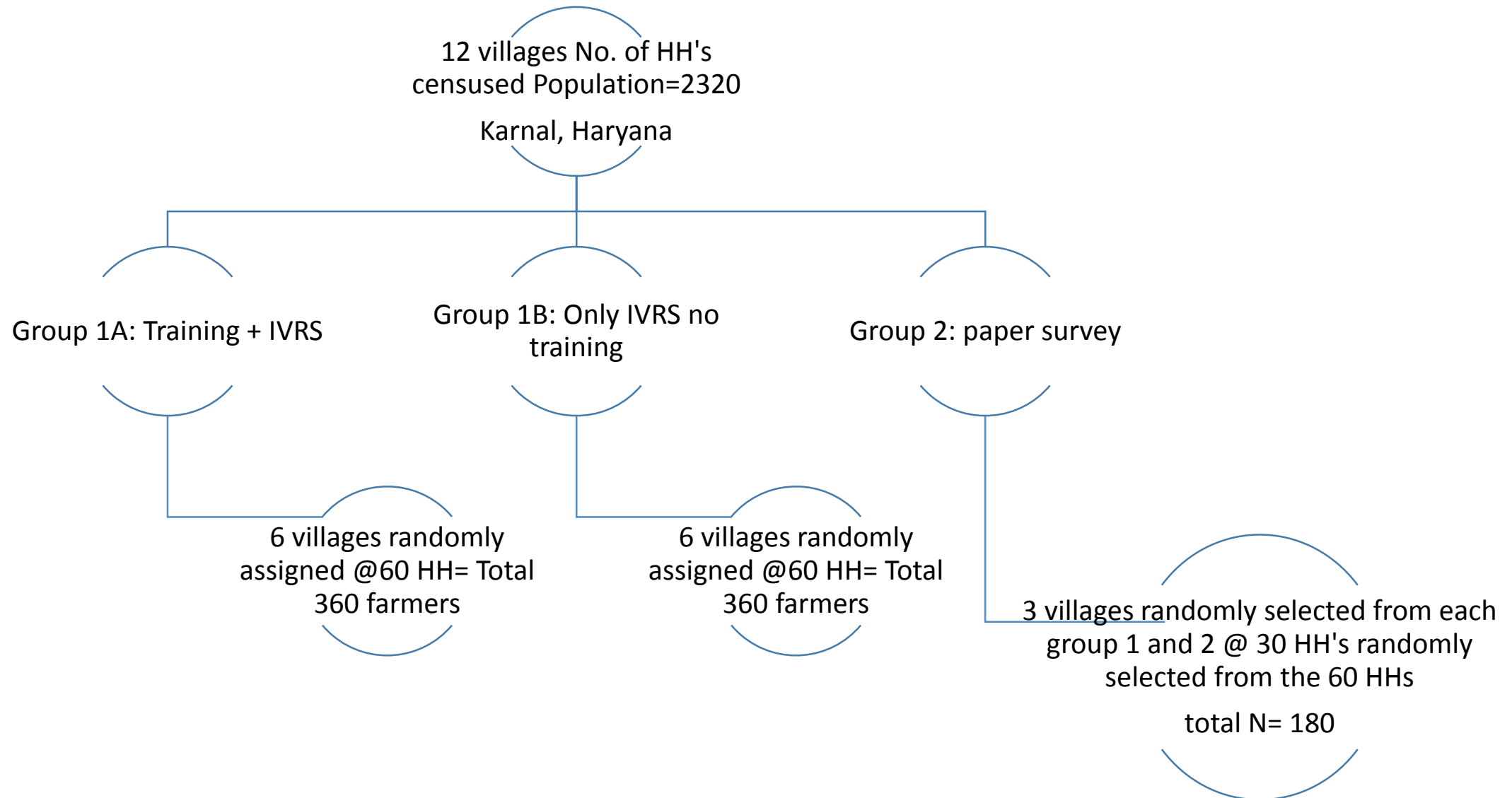
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Background and research Q's

- Increased penetration of mobile networks and in mobile handset enables the opportunity to use the mobile phones to collect information on adoption of technologies or even to track impact.

- Such technologies are expected to have low deployment and administrative costs, flexibility to customize and are easy to learn and implement.

- With this hypothesis the project was implemented to undertake a pilot of collecting information on adoption of NRM technologies using mobile phone.

- The major objectives of the study as (1) develop an innovative mobile phone based data collection model; (2) To collect data on adoption using this method and validate it with alternative methods.

Research Design and Data

- In this study a pilot has been conducted by developing a mobile phone based application Interactive Voice Response System (IVRS) for collection of information on adoption of selected NRM technologies and practices.

- IVRS is a system that can be programmed to manage a variety of data collection and customer support needs. Usually one call is less than 5 minutes, the response is converted into data that gets transferred to data base worksheets automatically.

- In the study farmers were contacted on their mobile phone to collect adoption data pertaining to adoption of selected NRM technologies.

- Farmers respond by dialing in the responses to the questions, in form of numbers on the mobile phone dial pad. This is done in response to a voice interface that sequentially asks few questions to record the adoption of a particular technology.

- The application is based on pull technology and is expected to be user friendly and literacy neural.

- Along with developing the application and the data logging system, this pilot project also involved initial training of farmers on ways to respond to this application.

Data sampling

12 villages No. of HH's censused Population=2320

Karnal, Haryana

Group 1A: Training + IVRS

Group 1B: Only IVRS no training

Group 2: paper survey

6 villages randomly assigned @60 HH= Total 360 farmers

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3 villages randomly selected from each group 1 and 2 @ 30 HH's randomly selected from the 60 HHs

total N= 180

Comparative table of all the methods on NRM technology adoption in Karnal, Haryana

Method	ZT		LLL		Not residue	burning
	% area	% of HH	% area	% of HH	% area	% of HH
IVRS (N=720)	17.2	36.7	23.0	65.9	-	81.3
Paper survey (N= 180)	9.6	16.1	45.9	57.8	94.0	87.8
Expert Elicitation*	15.9	7.4	46.9	40.2	62.9	66.4

Note: Ref year 2013-14; *180 HH of paper survey are sub sample of 720 HH of IVRS*
*: these estimates are collected at District level, and not specific to the 12 villages of Karnal district, thus these estimates of expert elicitation are not fully comparable with IVRS.

Comparison between the two methods for identical households (N=133)

Variables	IVRS	Paper survey	Pair sample correlation	Pair sample test- t value
% HH using ZT	30	16	.093	0.901
% area under ZT	6.95	9.54	0.55	-0.345
% HH using LLL	100	59	-0.35	2.051
% area under LLL	27.57	44.55	0.64**	-0.696
% farmer not burning residue	91.7	89.4	-0.11	-0.44

**: Statistically significant at 5% level

Results

- Overall, in this first pilot of its kind we have not been able to reach a definite conclusion if the results collected through the IVRS model are valid.

- Still it has open up avenues for trying and testing this model again in ongoing projects after some initial exposure to the farmers.

- But we are still assured, that this model can be a good tool for monitoring the progress of adoption as it will save lot of time and cost linked with paper surveys.

- It is technically not difficult to improve the use of this model to collect data and implement it in larger geographies where mobile phone penetration and use exists after incorporating the main lessons learnt from this pilot experiment

Key messages

- Monitoring the adoption trends is a dynamic and time consuming process. The use of IVRS do help in reducing some of the transaction costs.

- The IVRS technology used to collect data on adoption resolves the issue of scalability as it can be inclusive of all types of locations with mobile penetration, and does not have bias towards the type of phone handsets and service providers thus increasing the reachability especially in rural environments.

- The application of the IVRS based survey will be neutral to any of the agricultural or natural resource management technologies and practices. The set of survey questions and the question sequence can be easily adapted on any technology and its adoption and can be customized in the system.

Key messages

- Farmers do appreciate the limited time that they have to spend with IVRS as compared to the long paper surveys done conventionally

- Overall, the application developed to test this technology is simple enough so that it can be easily customized as per the location to the extent possible, and also to reduce the add-on costs of using this technology to other geographies.

- Cloud solutions/ applications are available to remotely host IVRS application, allowing different locations to be connected through one/ the same infrastructure.

Limitations and Lessons Learnt

- The respondents to the IVRS survey need to have a basic understanding of use of the mobile phones and be capable of responding to the questions using the digital pad on the phone.

- The application of the IVRS based survey will be neutral to any of the agricultural or natural resource management technologies and practices.

- The application itself is limited by the fact that only short surveys can be conducted at one point of time. Thus it is suggested that such surveys are run with only few questions and one technology or practice at a time. The cost of administering these surveying will be minimal

- The project had already envisioned the risk on validity of the data collected through IVRS if the farmers are not able to understand the purpose of this survey and disconnect the phone. Thus it is definitely important to run pilots and awareness how to respond to the IVRS based survey.

- The prerequisite to make this data collection possible is that a data base of mobile phone numbers exists. If such a data base is not available this can lead to a delay in implementing this method.

- There is a possibility of bias in responses received, as the farmer can choose not to participate in the survey for various reasons and thus may drop out and only those farmers who are aware or have adopted the technology might be the respondent.

- The IVRS method was based on pull technology and in this technology, we are initiating the call to farmer and thus the issue of self-selection bias reduces.