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PRA TECHNIQUES IN AGRICULTURE: COMMON DIAGRAMING AND MAPPING TOOLS

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Abstract

PRA techniques and tools commands paramount importance in bottom up approach of planning and implementation of agricultural programmes. The following paper describes the various PRA techniques used in the study such as Transect, Mobility map, Timeline and Time trend. Apart from PRA, other methods of data collection such as use of semi-structured interview schedule, direct observation and focus group methods were also used to elicit information from the villagers.

Introduction

Participatory Rural Appraisal (PRA) is an exercise for communication and transfer of knowledge. Regardless of whether it is carried

out as part of project identification or appraisal or as part of country economic and sector work, the learning by doing and teamwork spirit of PRA requires transparent procedures. For that reason, a series of open meetings (an initial open meeting, final meeting, and follow up meeting) generally frame the sequence of PRA activities. These are techniques which provide a first hand appraisal of rural situations and provide an indepth insight in to rural milieu and their way of life, which cannot be otherwise collected through conventional methods of data collection and enumeration. Common tools in PRA are: 1. Diagramming, 2. Interviewing, 3. Preference ranking, 4. Mapping and Modeling

PRA methods have great utility while preparing extension programmes. (Lekshmi *et al.*, 2009) The following research paper has been prepared by a multidisciplinary team of six members from different disciplines namely Agricultural Microbiology, Environmental science, Agricultural biotechnology, Fish Nutrition, Fish health and Agro-forestry. The various techniques used by the multi disciplinary team to collect information are as follows:

- 1 Direct observation, collection and verification of primary data.
- 2 Collection of secondary data from panchayat members and officials of the State Dept. of Agriculture.
- 3 Semi-structured interview by raising some general issues to motivate villagers participation in different aspects of the village.
- 4 Collection of detailed views by approaching some representative key informants.
- 5 Use of snowball technique to know more about some specific issues.
- 6 Participatory mapping for rapport building, easy interaction and spontaneous involvement.
- 7 Seasonal analyses to understand different time bound farm activities, problems and opportunities throughout the year.

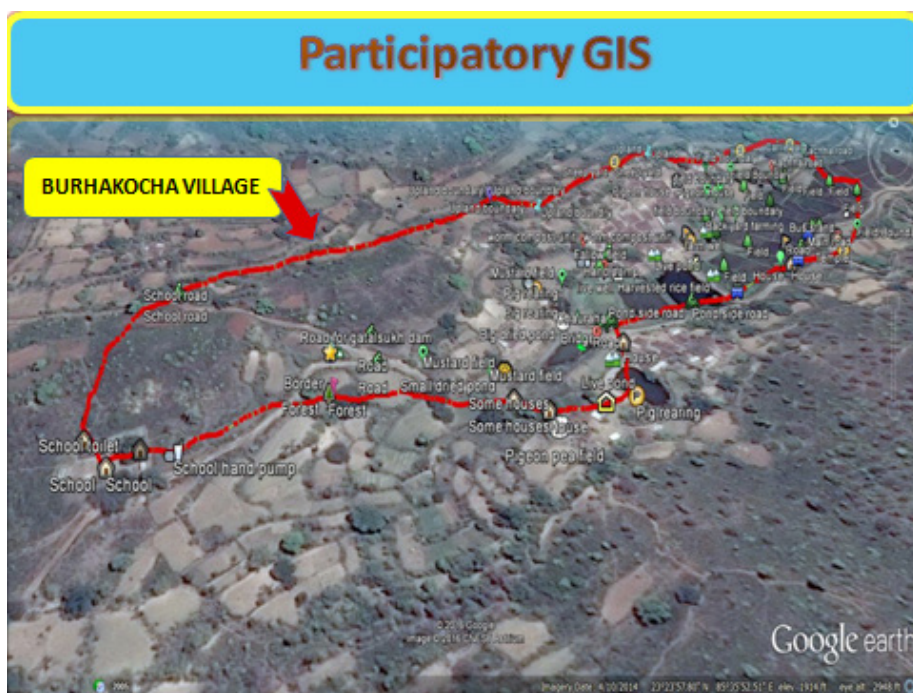
Findings and Discussion

The following paper describes the important PRA methods followed such as transect, mobility map, time line and time trend of important crop and animal products.

1. General Transect of the Village

Key informants: Mr. Jagarnath Bedia, Mr. Rajusi Bedia and Mr. Chauta Bedia

Transect is the walk through the village in a particular direction along with some key informants. The main objective of the transect is to understand and study the major land uses, topographical pattern, water resources, crops, natural vegetation, livestock and different ecological zones by observing, interacting and discussing with the key informants, while walking in the decided direction. The items for discussion included topics like land use pattern, land slope, soil type, soil fertility status, water resources, crops, weeds, trees and livestock.



The transect walk was done from south to north direction in the village along with the Key Informants. The walk started from the southern end (Middle School) of the village. The entire village of Burhakocho

is divided into two zones, *viz.* cropped and residential area. The total land area of the village consists of upland (forest), middle land and lowland (rice fields). The residential area is in the middle land area surrounding all around the paddy fields in lowland.

The area in the southern part contains most of the fields including rice based agro ecological zones. This area is followed by the residential areas which have most of the livestock population of the village and also fields for vegetable cultivation. All the four ponds of the village are located in the lowland area. And finally in the upland area, there are forests including Lac host trees which serve as an important source of income to the farmers in the village.

Table 1: The various aspects/ characters of the village

Particulars	Low Land	Mid Land	Up Land
Topography	Almost plain	Undulated	Steep
Soil	Laterite, Clay	Red Laterite	Red Laterite
Crops	Rice	Onion, Tomato, Mustard, Garden pea, Cabbage, Cauliflower, Chilli, Drumstick, Brinjal, Banana	Kusum, Ber, Palas
Livestock	Cow, Poultry, Duck, Buffalo, Pig, Fish	Cow, Goat, Poultry, Buffalo, Pig	-
Trees	Karma tree	Bamboo, Karma tree	Forest trees
Water sources	Well, Pond,	Well	-
Insects & Disease	Gundhi bug, Yellow stem borer, Bacterial leaf blight	White blister of crucifers, Powdery mildew, Rust, Blight	Predator insect of Lac insect
Weed	<i>Echinochloa colonum</i> , <i>Cyprus rotundus</i> , Wild colocasia, Buffalo grass	<i>Lantana camera</i> ,	-
Problems	Waterlogging, Weed problem, Rice lodging, Pest and disease	Water scarcity, Pest and disease, Nutrient deficiency due to leaching	Soil nutrient deficiencies, Pest problem
Opportunities	Selection of lodging resistant varieties, Integrated water management	Water harvesting, planting fodder crops to prevent soil erosion, Raising intercrops in banana fields, Mulching, utilisation of land for horticultural crops	Water harvesting, Contour bunding, Adoption of agro-forestry and boundaries

2. Mobility Map

Mobility map is to study day in and out movement of villagers for different purpose. This map leads to explore the spatial mobility of the villagers for the different activities like health/medical, marketing, education and entertainment. The KI's were asked to give information on mobility of villagers and information were collected on the basis of location, purpose, distance, mode of transport and transport cost to each location. It was observed that Jonha (6 km from village) was the most frequently visited place because farmers going there to sell their vegetables and other agricultural produce, to procure agricultural inputs, for visiting PanchayatBhavan whenever required to gather information, for visiting hospital, post office, for shopping and for higher education for children (school). They are going to Getalsud (8 Km from the village) for visiting market, for purchasing grocery items and for using facility of bank. Villagers of Burakocha are going to Angara block for getting information from block development office and also police station is located over there. Villagers go to Moori for going railway station. Detailed mobility of Burakocha along with distance has been given in the table.

Table 2: Information about mobility of villagers

<i>SL. No.</i>	<i>To/From</i>	<i>Mode of Transport</i>	<i>Distance (Km)</i>	<i>Fare (Rs)</i>	<i>Purpose</i>
1	Jonha	Walk/Cycle/ Two wheeler/ Jeep	6	10	Agricultural market for selling and purchasing of agricultural commodities, High school, Panchayatbhavan, Bank, Govt. Hospital, Post office,
2	Getalsud	Walk/Cycle/ Two wheeler/ Jeep	8	10	Market, Purchase of grocery items, Bank of India
3	Angara block	Cycle/Two wheeler/Jeep	15	25	Block development office, Market, Police station
4	Moori	Jeep/Bus	30	30	Railway station
5	Ranchi	Auto/Jeep/Bus	35	30	College, Market, Hospital
6	Morabadi	Jeep/Bus	45	50	Divyayan training centre

3. Time Line

This indicates the major events in agriculture remembered by the villagers. Both historical and futuristic timelines can be drawn. While

the historical timelines are common for analyzing an understanding the developments or major events and interventions that had their bearing on the agriculture sphere in the past, whereas, the futuristic timelines would provide leads for planning and development trends. The KI for the historic timeline is to be chosen carefully who would be old enough and knowledgeable on the major events that affected agriculture.

An illustration of time line of Burhakocha village (Ranchi District)

Time line is a tool of PRA technique is used to know the history of major remembered events in community and their significance. It indicates the causal link between past and present. The purpose of this tool is to obtain historical account of changes in demography, socioeconomic, communication, social relationship and interaction, technology diffusion and adoption etc. information regarding the important events like the development in agriculture, animal husbandry are collected from the key informants, preferably elderly people of the village and presented in the table.

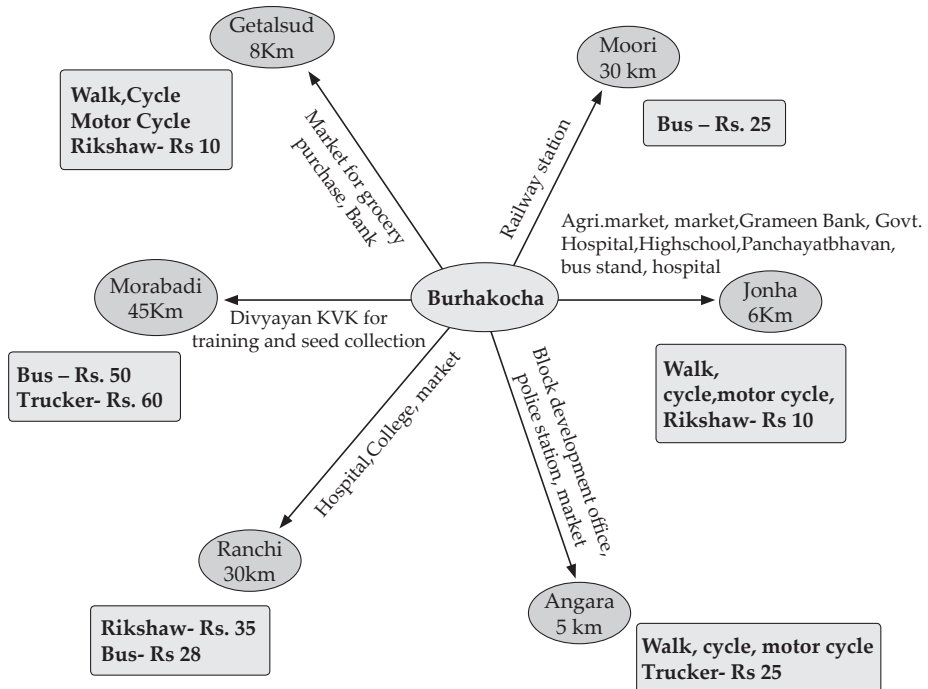


Fig 1: Mobility map of Burhakocha village

Table 3: Information about time line of Burhakocha village

S.No	Year	Event
1.	Before 1908	Village was established
2.	1982	Use of pesticide and bi-cycle
3.	1985	First common open well
4.	1987	Night schooling
5.	1988	Middle school
6.	1988-91	Kaccha Road was constructed through the Shramdan
7.	1993	Solar system, bio gas and club
8.	1994	Diesel and hand pump
9.	1995	Use sprayer
10.	1998	First tank
11.	2003	Poultry farm and paddy thresher
12.	2006	Vermi-compost
13.	2009	Scientific cultivation of Lac
14.	2009	Cremate was started (before that it was only buried)
15.	2009	First use of hybrid varieties
16.	2010	System of rice intensification
17.	2010	Use of mobile and bike
28.	2010	Training for scientific agriculture and allied sector
19.	2011	Kisan club started
20.	2011	Agricultural co-operative society
21.	2012	Use of auto and jeep
22.	2013	Use of Conoweeder and Ridge bed furrow irrigation system
23.	2013	Bridge
24.	2014	Concrete road and bridge
25.	2015	Lac co-operative society

Key informants: Mr. Motiram Bedia, Mr. Bhajan Bedia, Mr. Madhv Bedia and Mr. Makesh Bedia

The details were collected from senior people occupying responsible positions like village leader. It was observed that herbicides have been used since early 1980s in Burhakocha



village. It is also observed that one biogas plants were constructed in this village during 1993, however this biogas plant dysfunctional now. In 2009 the scientific cultivation of Lac were started by this village people with the help of training provided by the Divyayan KVKs. it was at the same time that the improved varieties of rice were introduced in 2009 due to which the rice yields significantly in the village. Subsequently the system of rice intensification technology of rice cultivation has been introduced by the DivyayanKrishiVigyan Kendra in the village during 2010. In order to increase the production of rice and to eliminate weeds from the rice field for that Divyayan KVKs introduced cono-weeder to that village. Similarly to increase the production of vegetables with less water requirement, the ridge bed furrow system was introduced by the Divyayan KVKs in 2013 onwards. Recently Lac co-operative society was started in that village which will really beneficial for this village to get better price for their Lac produce. However farming practices have not been on scientific lines and hence the production levels are quite marginal.



School



Solar light



Conoweeder



Paddy Thrasher

4. Time Trend

It depicts the changes in past few years/ decades indicating trends related to variables specific to the village concerned with agriculture. Time trends can be drawn on changes in cropping/ farming scenario, the area, production, productivity and price fluctuations *etc.*

An Illustration of time trend of Burhakocha village (Ranchi District)

Time trend is a simple PRA technique, usually depicted in the form of graph (bar/ line) to show the trend of crop/ animal production, commodity prices, human/ cattle population *etc.* The specific objective of this tool is to identify the changes/ fluctuations that have occurred over a period of time in the variables influencing village life.

Key informants: Mr. Jagurnath Bedia, Mr. Sushil Bedia, Mr. Raaki Bedia and Mr. Lakhiram Bedia

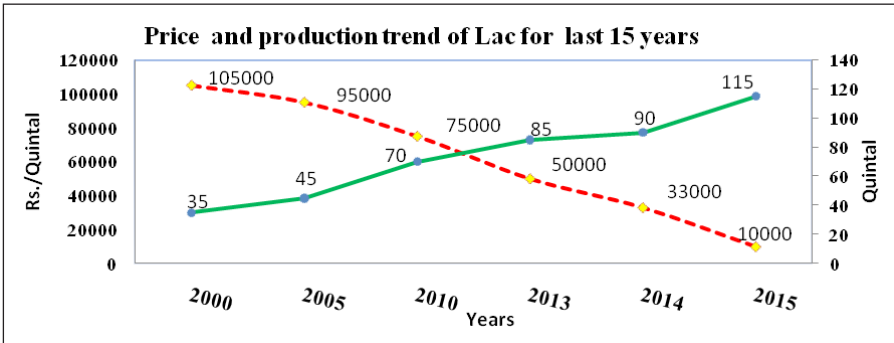


Fig. 2. Price and Production trend of Lac for last 15 years

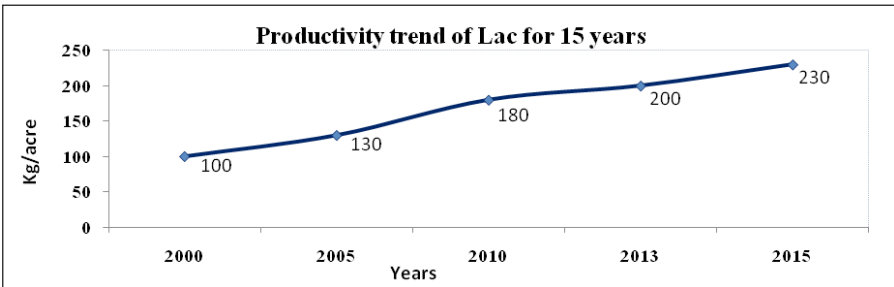


Fig. 3. Productivity trend of Lac for last 15 years

As shown in the figure 2 the price of Lac from 2000 to 2015 shows a decreasing trend with the price Rs.105000-10000/quintal respectively. There was a drastic decrease in price during 2015 due to higher production. The trend for productivity of Lac shows an increasing trend from 2000 to 2015 with the productivity of 100kg to 230kg/acre

respectively, due to introduction of scientific cultivation of brood Lac and also better income to the Lac cultivators which is shown in figure 3.

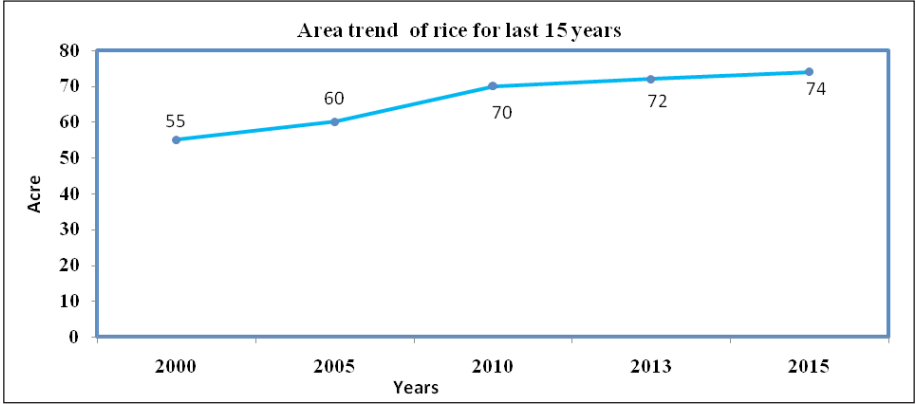


Fig. 4. Area trend of rice for last 15 years

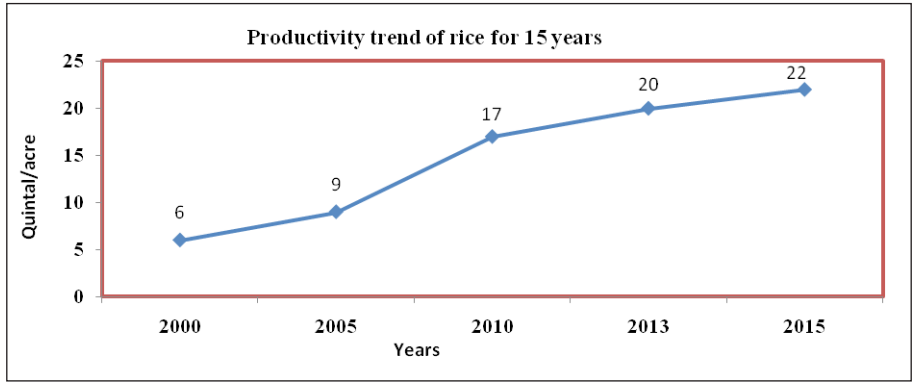


Fig. 5. Productivity trend of rice for last 15 years

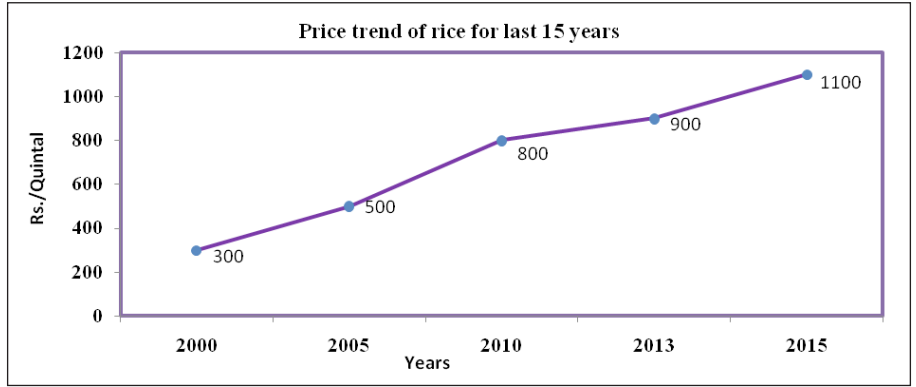


Fig. 6. Price trend of rice for last 15 years

As shown in the figure 4 the area trend of rice from 2000 to 2015 shows an increasing trend with the area 55-74 acre respectively. There was a drastic increase in rice area during 2010 due to availability of water and adoption of system of rice intensification. The trend for productivity of rice shows an increasing trend from 2000 to 2015 with the productivity of 6 quintal to 22 quintal/acre respectively, due to introduction of high yield varieties which is shown in figure 6.

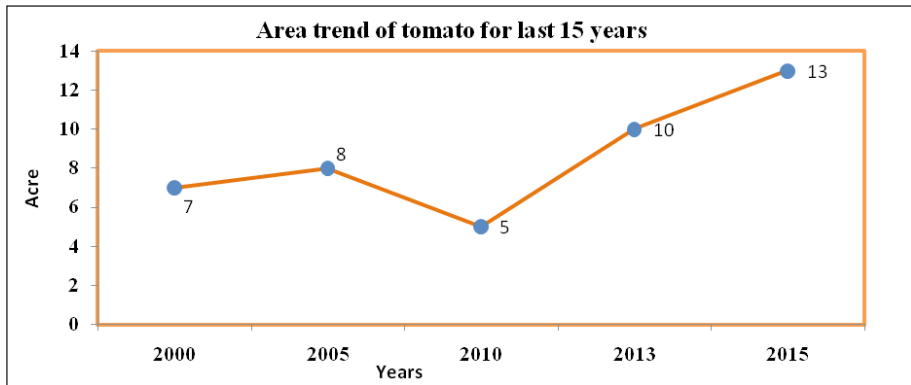


Fig. 7. Area trend of tomato for last 15 years

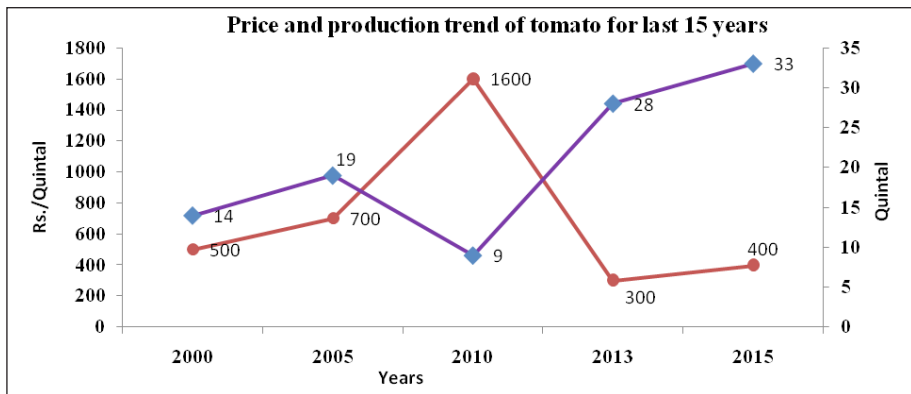


Fig. 8. Price and Production trend of tomato for last 15 years

As shown in the figure 7 the area trend of tomato from 2010 to 2015 shows an increasing trend with the area 5-13 acre respectively. The trend for production of tomato shows an increasing trend initially and later on it was decreased drastically due to reduction of cultivation area and also adoption of other crops such as pea and mustard *etc.* from 2010 onwards the production of tomato has been increased due to adoption of ridge bed burrow system introduced by the DivyayanKrishiVigyan Kendra which is shown in figure 8.

Conclusion

PRA tools such as general transects are done to gain insights in to the general features of a village, compare the main features, resource use and problems of different zones. The social map describes the social structure and characteristics of a rural society, neighborhoods, institutions and collectivities. The time trend in this paper captures the price and production trend of lac, trends in rice production, its price and production trends and price fluctuations in tomato crop over a period of time.

Acknowledgement

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