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e- Learning lessons on Participatory Rural Appraisal

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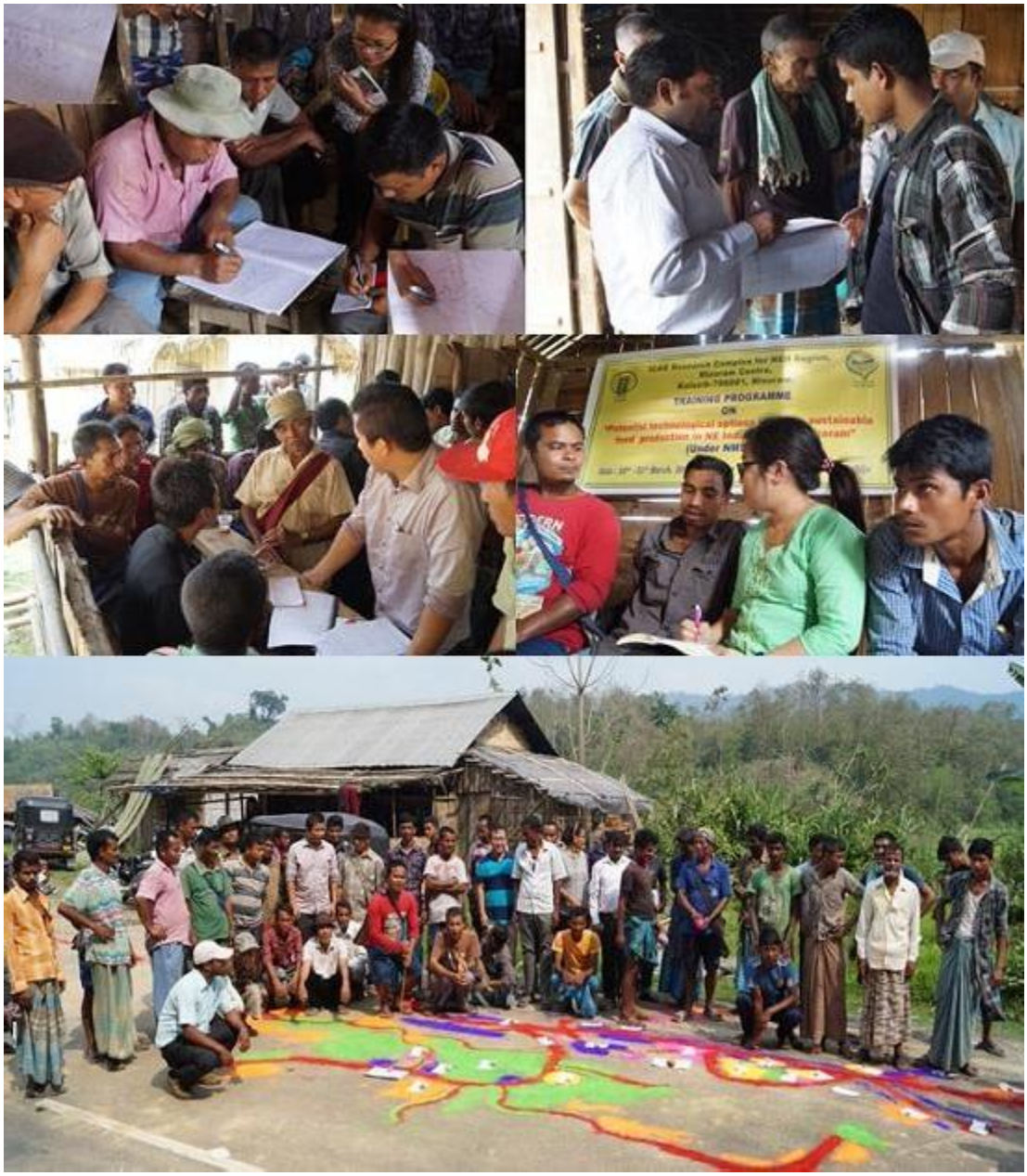


Participatory Rural Appraisal is a family of approaches and methods to enable local people to share, enhance, and analyse their knowledge of life and conditions, to plan, and to act.

-Robert Chambers

Preface

Participatory Rural Appraisal is a citizen -centered methodology devised to gather information about people in a rural set-up. Participatory Rural Appraisal (PRA) is an assessment method that falls under the qualitative and participatory group of research methods which allow researchers to interact with farmers in a direct and participatory mode. The methodology through collective insight assists an effective interaction and planning with the communities concerned. Participatory approach facilitates a chain of analysis, planning, monitoring and evaluation for social development. The advantages of PRA includes: - i) Right identification of target beneficiaries ii) Grass root -level development and management planning, iii) Mobilization of local resources, and iv) sustainable outcomes. The PRA method provides with a platform were the researchers can interact with farmers in a direct and participatory mode. PRA emphasizes on local knowledge and enables people to make their own appraisal, analysis, and plans. The validity of PRA data relies on informal interaction and brainstorming among those involved, it is best done by a team that includes local people with perspective and knowledge of the area's conditions, traditions, social structure etc. A well-balanced team will represent the diversity of socioeconomic, cultural, gender, and generational perspectives for the overall development of the community. PRA works on the method of triangulation with qualitative data. This e-lesson on participatory rural appraisal (PRA) will help the PRA team to get equipped with the concept of PRA, its different tools and why, how to practice it. Details PRA report will help the PRA team to understand the village or particular community in a very comprehensive way and to prepare the strategy in a holistic and participatory approach

-Authors

Content

e- Learning lessons on Participatory Rural Appraisal

Introduction:

Agriculture in North east India may characterize as existence of diverse agro-climatic conditions, topography and soil types which has not only increased the crop diversity but also led to variations within crop species according to the local soil and weather conditions.The nature of agricultural practice and the livelihood process in NEHR are based upon the topography and agro-ecology where land belongs to the 'people' (Datta, 2017). The factors such as scattered-fragmented landholdings, the rising cost of cultivation, lack of proper access to technology and markets lead to unproductive farm output.Hereafter, in order to improve the livelihoodorliving conditions of farmers, there is a need to re-orient our agricultural research planning on actual farm conditions which requires direct contact between the researchers and main stakeholders i.e. farmers. In the context of development, information regarding the farming communities, their existence livelihoods, their beliefs, the physical environment in which they live, and their resource endowments need to be gathered and interpreted in a manner that identifies their priorities with a view of developing better understanding of their status and designing appropriate intervention projects directed at resolving their problems.

Participatory Rural Appraisal (PRA) as a data collection method falls under the qualitative and participatory group of research methods allow researchers to interact with farmers in a direct and participatory mode. Basically, PRA has rooted to originate from the concept 'Rapid Rural Appraisal (RRA)'. Robert Chambers (2004) describes PRA as "***a growing family of approaches, methods, attitudes and behaviours to enable and empower people to share, analyze and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect***". While RRA focuses on data collection or extraction of information from the people, PRA focuses on empowerment. It needs to be noted that although RRA and PRA carry the term 'rural', they can both be and have been applied in urban settings.

PRA emphasizes on local knowledge and enables people to make their own appraisal, analysis, and plans. In PRA, data collection and analysis are undertaken by local people, with outsiders facilitating rather than controlling. It is an approach for shared learning between local people and outsiders. It is works on the principle of participation i.e., local people's

input into PRA activities is essential to its value as a research, planning method and teamwork.

The validity of PRA data relies on informal interaction and brainstorming among those involved, it is best done by a team that includes local people with perspective and knowledge of the area's conditions, traditions, social structure etc. A well-balanced team will represent the diversity of socioeconomic, cultural, gender, and generational perspectives for the overall development of the community. PRA works on the method of triangulation with qualitative data. To ensure that information is valid and reliable, PRA teams follow the rule of thumb that at least three sources must be consulted or techniques must be used to investigate the same topics. PRA is a planned developmental method focused of the locals. The community participation is the key for the development of a society. A developed society is about the well being of every individual and through PRA every individual can be empowered.

The World Bank Participatory Sourcebook (1996) puts the key tenets of PRA as follows:

• ***Participation***:

Local people's knowledge as input into PRA activities is essential to its value as a research and planning method and as a means for diffusing the participatory approach to development.

• ***Teamwork***: the validity of PRA data relies on informal interaction and brainstorming among those involved, it is best done by a team that includes local people with perspective and knowledge of the area's conditions, traditions,social structure etc. A well-balanced team will represent the diversity of socioeconomic, cultural, gender, and generational perspectives.

• ***Flexibility***: PRA does not provide blueprints for its practitioners. The combination of techniques that is appropriate in a particular development context will be determined by such variables as the size and skill mix of the PRA team, the time and resources available, and the topic and location of the work.

• ***Optimal ignorance.*** To be efficient in terms of both time and money, PRA work intends to gather just enough information to make the necessary recommendations and decisions.

• ***Triangulation:*** PRA works with qualitative data. To ensure that information is valid and reliable, PRA teams follow the rule of thumb that at least three sources must be consulted or techniques must be used to investigate the same topics.

Why PRA?

This series of participatory exercises help community members to have a betterassess their resources history, problems and overall situation as concerns agriculture,health, education, and other essential areas. Using local resources,PRA can help provide a framework for a community's sustainable,long-term development.

- PRA tools help development agents to understand the important local characteristics (local resources, history, culture,ecology, etc.)
- PRA tools assist in problem prioritization in a community in participatory mode.
- PRA helps to organizing and using local knowledge in understanding and planning for community from the agricultural development perspective.
- It also helps in designing development plans with the support of locals.

Preparations in conducting PRA:

a. Establish a PRA team
b. Conduct preliminary visits to the community
c. Developing PRA schedule

PRA team consists of four to five members, one of the team members will be designated as team leader, and for each PRA session one individual should act as a facilitator (even team leader may also serve as facilitator). As a key objective of the PRA is to promote active community participation, the role of the facilitator is very important and includes:

Before the Session:

- Knowing the contents of the session very well in advance so that they rarely have to look at the manual during the exercise.
- Ensuring that the PRA site is well prepared – that there are enough places to sit, that the area is well shaded, etc.
- Ensuring that the participants can be seated in a circle shape so that they can see the facilitator, other participants, as well as any display or blackboard which may be used properly.

  About two weeks before the PRA, the PRA Team should meet to review activities already undertaken and develop the actual schedule for the PRA. Important activities include: • fixing the dates for the different PRA sessions in consultation with the

villagers; • indicate the particular sessions and their specific dates including the results expected of each session; • Specify the roles of each member (facilitator, note taker, etc.) • Material preparation; • Logistics (transport, lodging, food preparation); • indicate the specific date when the preliminary report should be produced etc.

During the Session;

Introduction session; here facilitator should take special care to ensure that participants should understand major focus of the PRA is to identify areas that the community itself can address with little or no outside assistance, and the villagers should understand that the success of the PRA depends on the active participation of all community members.

- Ensuring that all participants understand and equally contribute to the discussions. If some participants are not contributing at all, need to ask them directly what they think. Do not let only one person or a small group of participants dominate the discussions; pay special attention to women and the poor who may not feel comfortable contributing.
- Make sure that team members share their ideas only after the community members have provided their own, and that the team members avoid influencing the community's decisions.
- Managing the time available for the session to ensure that all objectives are achieved.
- At the end of the session, thank participants for their contributions and explain to them the next activity.

PRA recognizes that there is not only one source or type of data which can provide all of the information necessary for identifying and developing solutions to community problems, the PRA team collects many different kinds of data in line with the PRA activities outlined under. To verify the validity of the data, triangulation (*i.e.*, checking the correctness through different groups or similar mechanisms) may need to be used.

Some more points to take care during data collection;

- Review and understand the points for discussion for each session, most PRA activities are based on discussions with community members, and each of these discussions is guided by a list of questions which all PRA Team

members should become familiar with, These questions not only help to guide the discussions, but they also ensure that the information gathered is similar for each PRA conducted, and which may be used in program planning, monitoring and evaluation if the PRA is followed with some intervention.

- Involve the community in verifying the accuracy of data collected: At the end of each PRA session, ask participants if information collected (in notes, on flip chart paper, etc.) is accurate. During PRA Team meetings, if some of the information collected by different team members seems to conflict, ask other members to clarify.
- Pay Attention to Non-Focus Areas: Although PRA Team members may be responsible for specific technical areas, they should also recognize the importance of other information which may not relate directly to their area of responsibility – but which directly impacts household and village-level decision making. This may include information on social and community relations, ecological systems, geography, economy, etc.
- In every PRA activities PRA team need to mention the name of 3 to 4 key informants involved in that particular PRA activity.

After the Session;

Though the villagers will have provided a brief evaluation of the PRA upon its completion, the PRA Team should also provide its own evaluation. the report provides basic data on the village, the PRA team, as well as a summary of the results of each PRA activity Based on the report , strategy should be formulate to address the problem;continue monitoring and proper follow-up must be carry on.

The PRA methodology utilizes different PRA tools which are divided into spatial, temporal and relational issues.

a. Spatial Issue

1. Basic information about the village
2. Resource map
3. Social map
4. Transect walk
5. Mobility Map
6. Indigenous Technology knowledge (ITK) map
7. Technology map

b. Temporal Issue

8. Daily activity profile and Daily routine diagram
9. Seasonal analysis (activities, problems and gender disaggregation)
10. Time line
11. Time trend

c. *Relationship Issue*

12.Venn diagram
13.Consequence diagram
14.Matrix ranking
15. Problem identification and prioritization
16. Problem-causal and solution tree
17.Action plan

Community Mapping:Mapping is a good technique to start PRA because it involves several people, stimulates much discussion and enthusiasm, provide the PRA Team with an overview of the area, and deals with non-controversial information. This exercise helps everyone understands the scope of issues to be investigated.

RESOURCE MAPPING:

The village resource map is one of the important PRA tools that help us to learn about a community and its resource base. The primary concern is not to develop an accurate map but to get useful information about local peoples' perceptions of resources. The participants should develop the content of the map according to what is important to them. Resource map focuses on the natural resources available in the locality and depicts land, hills, rivers, fields, vegetation etc. It may cover habitation as well; a resource map in PRA is not drawn to scale. It is done not by experts, but by the local people. The local people are considered to have an in-depth knowledge for the surroundings where they have stayed for a long time. Hence the resource map drawn by the local people is considered to be accurate and detained. However, that it reflects the people's perception rather than precise measurements to scale. Thus, a resource map reflects how people view their own locality in terms of natural resources.

Resource map will portrait:

- Topography, terrain and slope of the village
- Forest, vegetation and tree species
- Soil type, erosion and depth
- Land and land use pattern, command area, boundaries

- Various soil and water conservation measures available
- Agricultural developments, cropping pattern, etc.

Key informants: as an exampleMr. X, Mr. Y. and Mr. Z

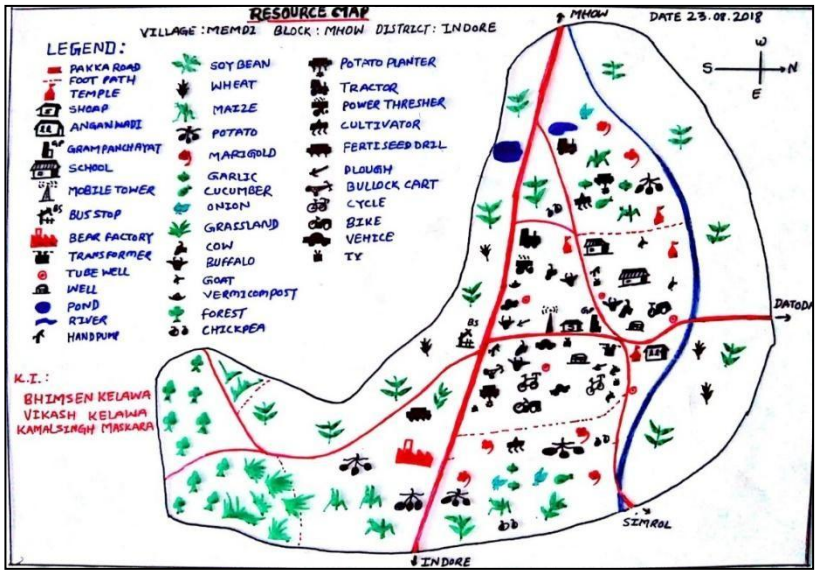


Fig 1., resource map

Key questions to ask: what resources are abundant? What resources are scare? Does everyone have equal access? Where do people go to collect water? Where do people go to collect firewood? Where do people go graze livestock? Which resources do you have the most problem with? Maps may include infrastructure (roads, houses, buildings, bridges, etc); water sites and sources, agricultural lands (crop varieties and locations); soils, slopes, elevations, forest lands, grazing areas, markets; health clinics, schools, churches; special places (sacred sites, cemeteries, bus stops, shrines, etc).

Use the key questions to guide and initiate a discussion about resources in the village. One or more facilitators should ask the questions, another should take notes on what is said. Be sure to draw a picture of the map on a piece of paper and final map should include direction indicators (North, South, East, West).

SOCIAL MAPPING:

Social mapping is perhaps the most popular method in PRA. The focus here is on the representation of habitation patterns and the nature of housing, social infrastructure: roads, drainage systems, schools, drinking water facilities, etc.The chief feature of a social map is that it is a big help in developing a broad understanding for the various facets of social

reality, viz., social stratification, demographics, settlements patterns, social infrastructure, etc. of a particular village. Social mapping of the intervention site will help us to develop a comprehensive understanding of the physical and social aspects of life, collecting demographic and other required information household wise.

Points to cover:

- Information on caste and community, religion exist.
- Social infrastructure available, road, electricity, water, or irrigation facility
- Govt. institutions (e.g. Schools, anganwadi, panchayat etc. or any other) exist.
- Political scenario and any social evil(s) in the village.

Key informants: as an exampleMr. X, Mr. Y. and Mr. Z.

TRANSECT WALK:

It is one of the PRA method used to explore spatial dimensions of the intervention site. Transect is the observational walk through the different direction of the village along with some key informants. The main objective of the transect is to have a systematic understanding of the viability of resources and identify the problems, observe the major land uses, topographical pattern, land type, land usage, access, water resources, crops, natural vegetation, livestock and crops, problems, opportunities and solutions.

Transect Walk

Criteria	**Roadside Field**	**Riverside field**
Soil type	Medium Black	Deep Black
Topography	Medium	Low
Crops	Soybean, Maize, Beans, Cucumber, Pumpkin	Soybean
Fruits & Other trees	Mango, Neem, Palm, Babul, Subabul, Gauva, Kaner, Custer apple,Mulberry	Neem, *Dalbergiasisu*Teak, Mahogany, Bamboo, Babul
Water resources	Tube wells, Hand pump	River, Tube well
Disease and pest	SOYBEAN: Collar rot, Charcoal rot, Girdle beetle, semilooper, Tobacco caterpillar Marigold : Thrips, Aphid	SOYBEAN: Collar rot, Charcoal rot, Semilooper, Tobacco catepillar
Weeds	Congress Grass, Lantena, Echinochloacolonum, Cynodondactylon	Lantena, *Cynodondactylon*
Problems	Pests and diseases	Pests and Diseases
Opportunities	Drought prone variety	Check Dam, *Balram* pond, fisheries

A transect is different from resource map despite some aspects are in common. The resource map provides a bird's eye view of the locality with a focus of natural resources available. A transect, however depicts a cross sectional view of the different agro- ecological zones and provides a comparative assessment of the zones of different parameters. It is generally done after a resource map and, therefore, helps in triangulation. It also helps in taking forward the process of problem identification and planning for the development of the natural resources in the area.

Key informants: as an example, Mr. X, Mr. Y. and Mr. Z.

MOBILITY MAP:

Mobility map is a PRA tool which is used to explore the movement pattern of farmers for in search of resources, services, and other purposes. It tries to answer questions which are based on their movement like where people go and for what reason? How frequent are the visits, what is the distance, and what is important about the place visited? This information gives us a snapshot of resources which are lacking in the village and which are surplus. For all other purposes where villagers go or from where they avail like marketing of agricultural produce, procurement of seeds and planting materials, purchase of fertilizers, pesticides, agricultural tools and implements, or for consultancy at KVK, various agriculture departments and veterinary hospital etc. By knowing this scientist can suggest possible interventions for arranging such services or materials either within the village or at a nearby place.

Key informants: as an example,Mr. X, Mr. Y. and Mr. Z.

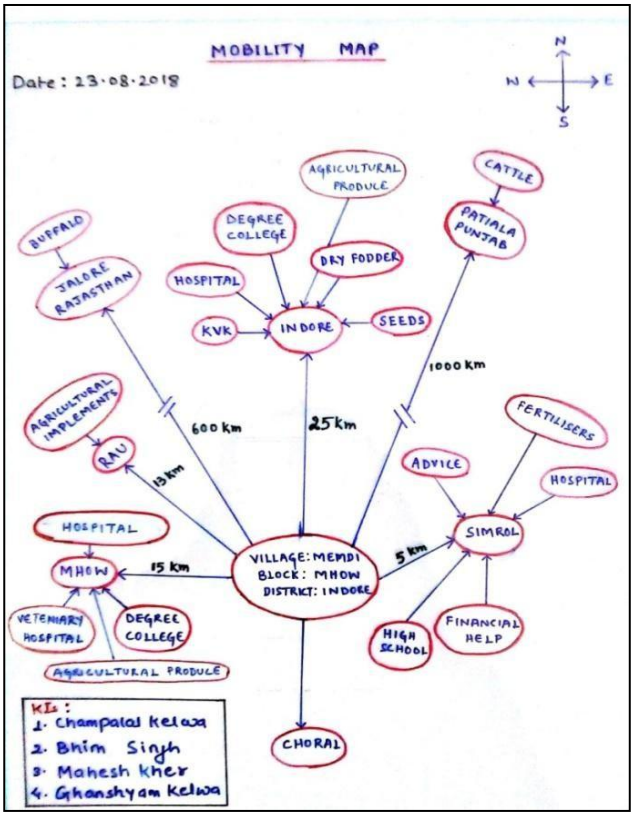


Fig 2., Mobility Map

INDIGENOUS TECHNOLOGY KNOWLEDGE (ITK) MAP:

Indigenous Technology knowledge (ITK) map of a village portrait the ITKs used and followed by the villagers in the field of agriculture and allied. It is a pictorial presentation of ITK used in a village map and ITK table describes little details of ITKs used like for what purpose they use and why.

As a e.g. ITKs used in X village

Sl.No.		ITKs	Purpose
1	Crops	Preparation of liquid concentrate by boiling leaves of calotropis and *Ipomeacarnea* with neem seeds	It is used as an insecticidal solution against gram pod borer (*Helicoverpaarmigera*). It is effective only for a limited time period of 15 days.
2		Use of highly fermented butter milk (fermentation is carried out during summer season for one month). It is first diluted with water at 0.25-0.5% and then sprayed	It is used to control gram pod borer (*Helicoverpaarmigera*). It is highly toxic and effective period is long.
3	Animals	Use of kerosene and baking soda	To cure bloating in animals
4		Use of gram flour (namkeen/mixture)	

		in paste form (by mixing with water)	

Key informants: as an example,Mr. X, Mr. Y. and Mr. Z.

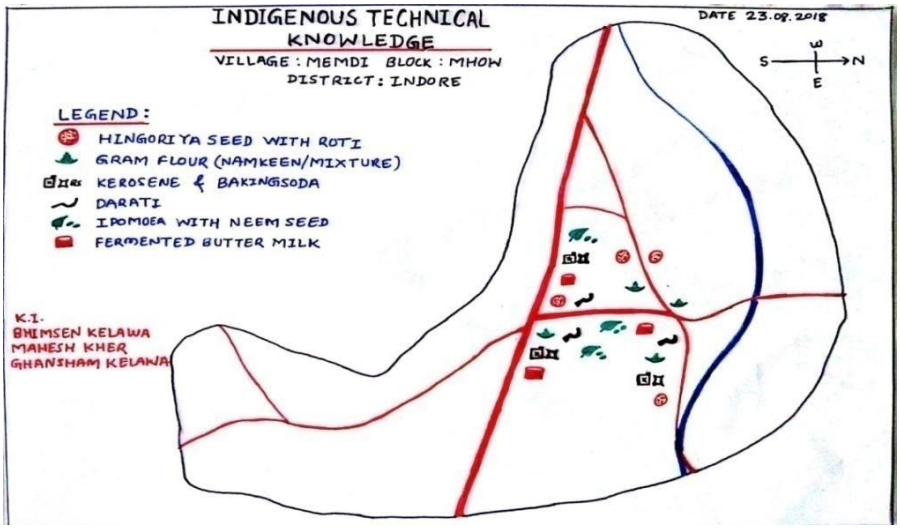


Fig 3., ITK Map

TECHNOLOGY MAP:

Technology map is another important PRA techniques which is useful to know about the agricultural technologies have adopted or followed by the villagers. It depicts different adoption behaviour towards different agricultural technologies by the farmers at the intervention site. Different adoption behaviours such as adoption, rejection, discontinuance, and re-invention of the technologies are to be recorded and discuss here.Apart from technology map, technology table explains the reasons for different types of adoption behaviour which helps the scientists and extension workers to come out with the possible solutions.

Adopted technology: Adopted agricultural technologiesare thosewhich have been adopted by the farmers of the particular intervention site.

Rejected technology: the technologies which are rejected by the farmers due to many factors like not fulfilling the purpose, unsatisfactory performance etc.

Discontinued Technology: the technologies which were adopted once by the farmers and later because of any problem or unsatisfactory performance of the technology(s) they have decided not to continue are to be recorded here.

Reinvented technology: the agricultural technologies which are adopted with some modification by the farmers at their level.

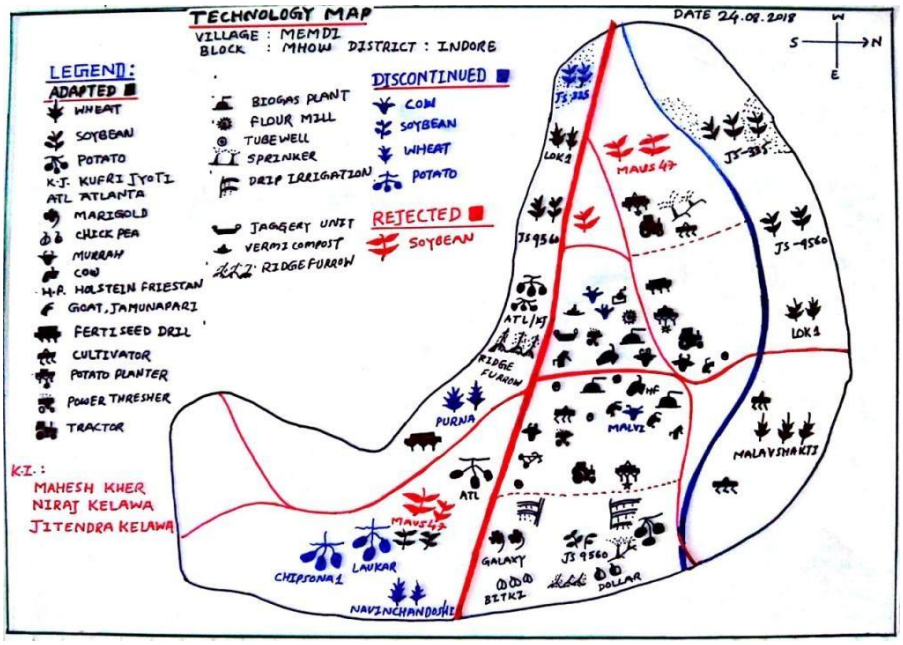


Fig. 4, Technology map

Technology table:

Sl. No.	Technologies	Reasons
Adopted Technologies		
1	JS-9560 (Soybean)	Short duration (80-85 days)
2	LOK 1(Bread wheat)	Requires lesser number of irrigations, good bread quality
Discontinued Technologies		
1	JS- 335	Longer duration (120 days) , Water requirement is high
2	Purna (HI 1544) (Bread wheat)	Water requirement is high
Rejected Technologies		
1	Maus 47	High Pod Shattering
2	JS 9041	Long Duration

SEASONAL CALENDAR:

Seasonalcalendar is also called seasonal diagram, seasonal activity profile and seasonal analysis. Seasonal diagram is one of the popular PRA methods that has been used for temporal analysis across annual cycles, with months or seasons as the basic unit of analysis. It reflects the perceptions of the local people regarding seasonal variations on a wide range of items. Seasonal diagrams, however, are not based on statistics, though they may be

triangulated against primary or secondary data in order to verify the information generated. It have been used to explore what happens in a year and when. Quantification and depiction of the magnitude of the various activities adds to their utility and richness.It may use to know about the crop calendar, pest and disease attack calendar, gender disaggregated data, income and expenditure pattern etc.

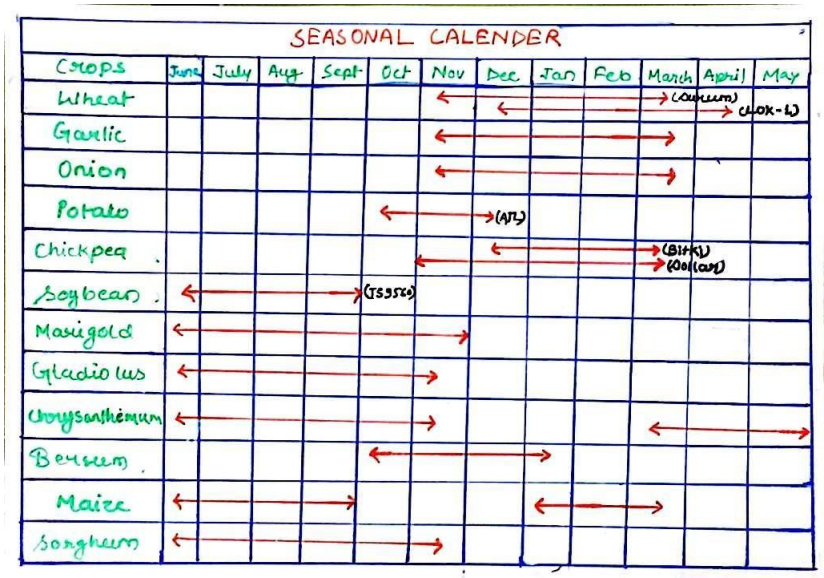


Fig. 5, Seasonal Calendar

- *Major points to cover*: what are the main agricultural activities during each season? Do some people migrate to other place? Rainfall pattern, labour availability, agricultural workload, crop calendar, food production and availability in village.etc.

DAILY ROUTINE DIAGRAM/ DAILY ACTIVITY PROFILE:

Daily activity profile of both the male and female farmers of any village depicts their economical and uneconomical daily activities since morning to night. Every farmer has different daily routine based on their type of farming and other activitiesIn order to plan any extension intervention,information about the daily routine of the farmers is a prerequisite. Here main focus is to find out their free time which they may spare on any planned intervention. It helps us to plan some suitable intervention based on their free time available.

Daily routine for female farmer (X village)	
Time	Activities
5:00 am-5:30 am	Wake up

5:30 am-7:00 am	Cleaning of cattle sheds
7:00 am-8:15 am	Cooking/breakfast
8:30 am-9:30 am (9:00 am-5:00 pm)	Fodder collection (Farm activities for female agril. labour)
9:30 am-11:00 am	Cows and buffaloes feeding and drinking
11:30 am-1:00 pm	Free time
1:00 pm-2:00 pm	Lunch
2:00 pm-4:00 pm	Free time
4:00 pm: 5:00 pm	Milking
5:00 pm-6:00 pm	Cleaning
7:00 pm-8:00 pm	Cooking
8:00 pm-9:00 pm	Dinner
9:00 pm- 5:00 am	Sleeping

TIMELINE:

It is another PRA tool which quite commonly used to explore the temporal aspects of a village. Timeline captures the chronology of events as recalled by local people; especially here old age peoples are preferred mostly for information. It is a historical transect of the village which is used for linking past and present conditions of the village. The purpose of this tool is to obtain historical account of changes in demography, socio-economic conditions, communication, social relationships and interaction, technology diffusion and adoption etc.It helps outsiders to learn from the community what villagers consider the important past events happens in the village. Timeline as a PRA tool also generate information on changes of different issues of a community/ village.

Major events in X village		
Mass communication		
S.No.	Events	Year
1.	Radio	1955
2.	Television	1985
3.	Color TV	1990
4.	News Paper	1990
5.	Cable Connection (DTH)	2012
Interpersonal communication		
1.	Landline Phone	1986
2.	Mobile Phone	2002
Basic Infrastructure		
1.	Electricity	1970
2.	Motor Cycle	1970

3.	General Store	1970
4.	Road connectivity	1980
5.	Fan	1988
6.	LPG	1996
7.	Bus Service	2000
8.	Pakka House	2008
9.	Mobile Tower	2018
Administration/ Government bodies		
1.	Gram Panchayat	1992
2.	Aanganwadi	2010
Education		
1.	Primary School (upto 5^{th})	1980
2.	Extended to class 8^{th}	1990
Agricultural events		
Implements		
1.	Plough	1980
2.	Hoe	1980
3.	Tractor	1980
4.	Cultivator	1981
5.	Seed drill	1981
6.	Power Thresher	1990
7.	Tube Well Irrigation	1990
8.	Potato Planter	2000
9.	Sprinkler	2005
10.	Drip Irrigation	2007
Crops		
1.	Black Soybean	1975
2.	Yellow Soybean	1985
3.	Marigold	2000
Agriculture Field Practices or related		
1.	Fertilizer use	1985
2.	Pesticides	1991
3.	Weedicides	2010
4.	Organic farming	2014
5.	Link with KrishiVigyan Kendra	1976
6.	Connection with Input Dealers	1990
7.	Self Help Groups formation	2008
8.	Crop Insurance	2010
9.	Women Land Rights	2011
10.	Link with Agricultural and Technology Management Agency	2013
11.	Minimum Support Price	2014
12.	Custom Hiring Center	2016
13.	Etc.	

TREND LINE:

Trend line or time trend is a time related or temporal method which is used to depict changes directly or indirectly related to agriculture and allied takes place over time. This is also useful to represent the data quantitatively. This use mainly to grasp the changes in many variable like *area under cultivation, production over time, human population, food production in village, imported food from outside of the village, livestock population, rainfall pattern, temperature, mechanization in village (number of tractors, number of power tiller etc.) , changes in water resources or irrigation facility, data on fertilizer use, number of pesticides spray, data on pest and disease outbreak over the years, availability of labours, income and expenditure pattern over time, any changes in natural resources like soil quality, water quality, forest area* etc.

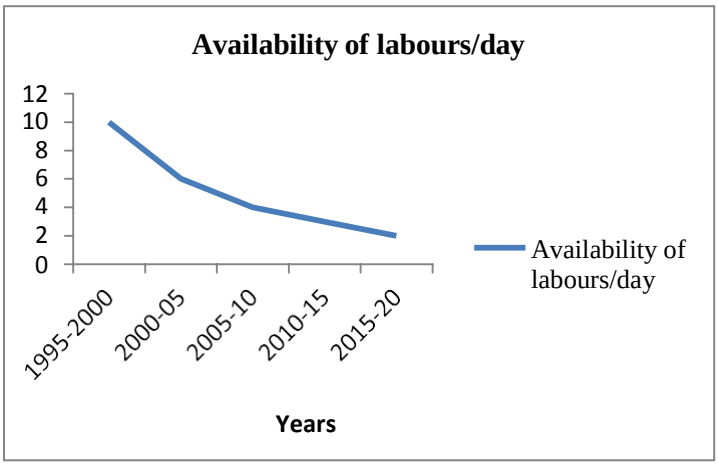


Fig. 6 Trend line of labour availability in X Village

As an example from the figure we can interpret that labour availability for agricultural purpose is decreasing day by day in X village which means people are migrating to cities for other works or people might be engaged with other non-farm activities. So, the villagers need more mechanization in agriculture and allied.

VENN DIAGRAM:

Venn diagram or chapathi diagram is another PRA tool use to know about the institutions, organizations, groups etc. working with or for the particular village. In venn diagram, village and organisations are drawn in the form of circle, village circle is present at the centre while

institute circles are present either within village circle or in its periphery depending upon their locations with respect to the village. Sizes of the institute circles are directly proportional to their importance with respect to the villagers and connection among them indicates their interaction with each other. Here main focus is to identify external and internal organizations/groups/important personsactive in the community.

Key questions:

Which organisations/institutions/groups are working in or with the community? Which institutions/groups do the villagers regard as most important, and why? Which organisations work together? Are there groups which are meant for women or men only?Any particular service from any certain institution?

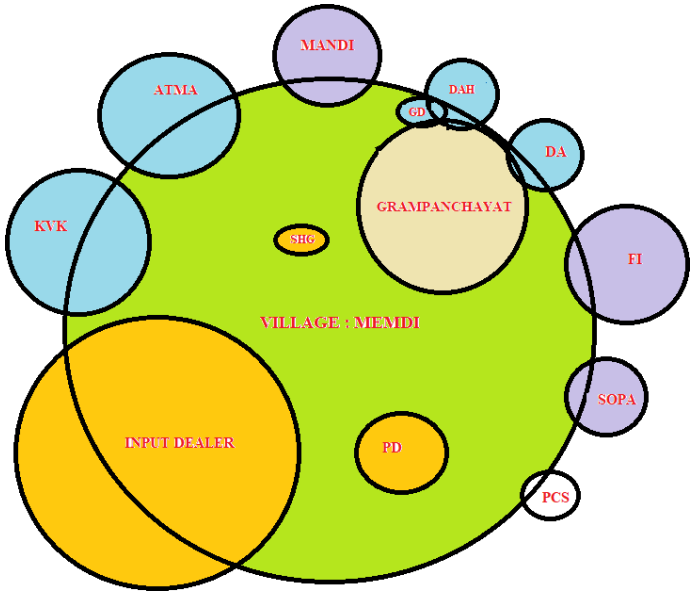


Fig. 7 Venn Diagram

- If time permits it will be good to do and prepare separate diagram for men and women folk.
- Ask the participants which organisations/institutions/groups are found in the village and which other ones from elsewhere working with the villagers.
- Ask them to discuss for each organisation how important it is for them. The mostimportant ones are then drawn as a big circle and the less important ones as smallcircles.
- Degree of contact/co-operation between themselves andthose institutions need to show by distance between the circles. Institutions which they do not havemuch

contact with should be far away from their own big circle. Institutions that are inclose contact with the participants and which, whom they co-operate most, should beinside their own circle. The contact between all other institutions should also be shownby the distance between the circles on the map:

Largely distanced circles: no or little contact or co-operation
Circles close to each other: only loose contacts exist
Touching circles: some co-operation
Overlapping circles: close co-operation.

- Ask villagers to notify any particular institutes only working for men or women (if any

CONSEQUENCE DIAGRAM:

Consequence diagram is a PRA tool which shows the positive as well as negative consequence(s) of any adopted technology. This diagram is useful in envisaging consequences of related technologies in agriculture and allied. The positive consequences of any technology can be promoted while the negative consequences are need to be address in order to minimized or overcome in future, so that farmers can get maximum benefit from a adopted or related technology.

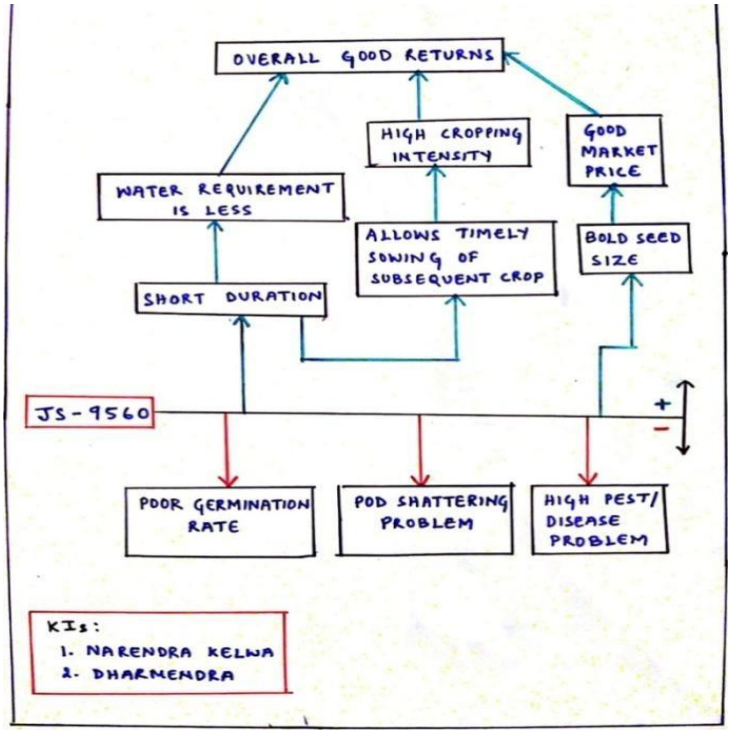
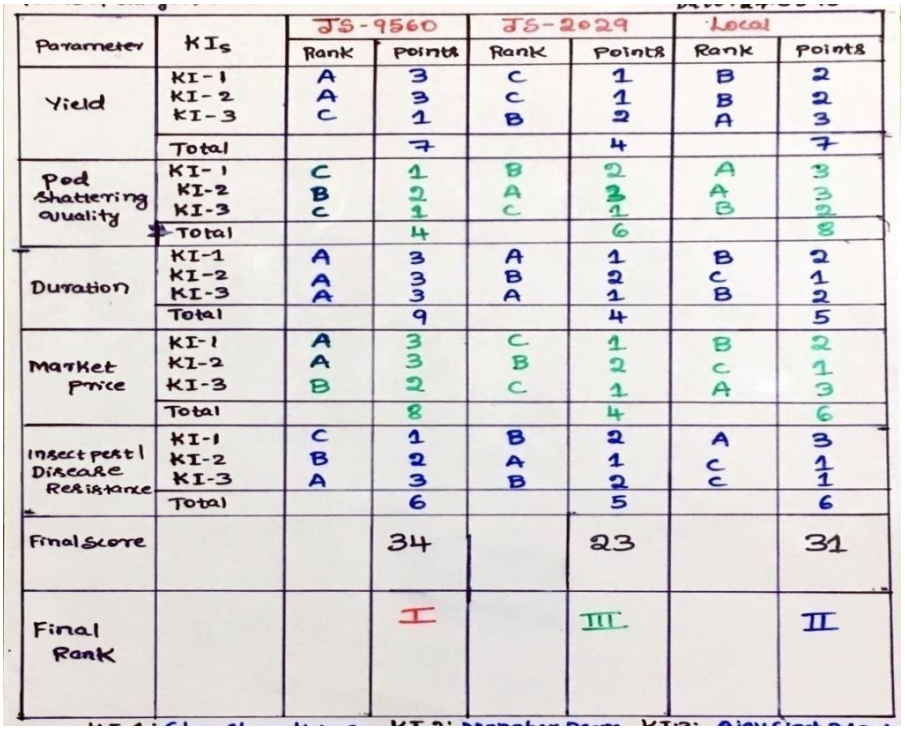


Fig. 8 Consequence diagram of Soybean variety (JS-9560)

MATRIX RANKING:

Matrix ranking isa tool used for systematic comparison of related technologies viz., cultivars / varieties of a crop adopted in a village.Three key informants (KI's) who have enough practical knowledge about the adopted cultivars / varieties in respective crops need to be referred for information. KIs will be asked to rank the cultivars / varieties on the basis of different criteria selected. Later, ranks given by KIs need to convert to scores. All the scores with respect to different criteria were summed (for one particular criteria, total numbers of scores assigned are equal to the number of key informants enquired) to get grand total. The cultivar / variety which receive the highest score will be ranked first while others receive subsequent rank as per the score received. This tool will help to know which cultivar lacking which quality and how to overcome that.



Parameter	KIs	JS-9560		JS-2029		Local	
		Rank	Points	Rank	Points	Rank	Points
Yield	KI-1	A	3	C	1	B	2
	KI-2	A	3	C	1	B	2
	KI-3	C	1	B	2	A	3
	Total		7		4		7
Pod shattering quality	KI-1	C	1	B	2	A	3
	KI-2	B	2	A	3	A	3
	KI-3	C	1	C	1	B	2
	Total		4		6		8
Duration	KI-1	A	3	A	1	B	2
	KI-2	A	3	B	2	C	1
	KI-3	A	3	A	1	B	2
	Total		9		4		5
Market price	KI-1	A	3	C	1	B	2
	KI-2	A	3	B	2	C	1
	KI-3	B	2	C	1	A	3
	Total		8		4		6
Insect pest / Disease Resistance	KI-1	C	1	B	2	A	3
	KI-2	B	2	A	1	C	1
	KI-3	A	3	B	2	C	1
	Total		6		5		6
Final score			34		23		31
Final Rank			I		III		II

Fig 9., Matrix ranking of Soybean cultivars in X village

PROBLEM IDENTIFICATION & PRIORITIZATION

The problem identification technique is the most important tool to identify and prioritize the problems prevailing in agricultural sector in a village. For this tool, PRA team need to consult 30 farmers from the village representing all sections of farmers. Other than those farmers,minimum three key informants (progressive farmers) also need to be referred. 30 Farmers were individually asked to rank the problems based upon the severity and percentage of loss they are personally facing by the particular problem. Since selected farmers represented all the sectors varying from rich farmers to landless farmers, ranking pattern were also diverse. Based on frequencies of each rank for a given problem, Rank Based Quotient (RBQ) was calculated using following formulae.

1 Rank Based Quotient

$$RBQ = \frac{\sum f_i(n+1-i)x100}{N \text{ X } n}$$

Where,
i = Concerned ranks (1 to 10)
N = Total numbers of farmers (30)
n = Numbers of rank
fi = Frequency (Number of farmers reporting that particular problem)

Calculated RBQ for each givenproblem will leads to identifying the top most researchable problem (s) by calculating their value based index from theirrespective RBQ values.

Value Based Index (VBI):

VBI = RBQ x Average economic loss percentage per annum

The problem with the maximum value based index was identified as the top most researchable problem or issue(s).

As an example, the top most four researchable problems of X village on the basis of their VBI are listed below.

Problem Prioritization (Rank Based Quotient and Value Based Index): Problem Prioritisation

Sl. No.	Problem	RBQ	Rank	Avg. economic % loss per annum	VBI	Rank
1	Migration of youth	103	1	26.34	2713	1
2	Soybean semilooper	79	2	20	1580	3
3	Chickpea wilt	49	3	37	1813	2
4	Potato Late blight	40	4	33.89	1355	4
5	Poor germination of potato (ATL)	06	10	22	132	9
6	FMD in cattle	19	6	10.27	195	6
7	Red water disease in buffalo	12	8	6.25	75	10
8	Mastitis	07	9	25	175	7
9	Pod borer of chickpea	33	5	23.61	779	5
10	Lack of Govt. veterinary facilities	17	7	9.57	162	8

PROBLEM AND SOLUTION TREE

After prioritization of problems, all possible reasons and solutions of each problem need to be discussed with the farmers. The causes may also validate with the subject matter specialist or specialist from state departments (if possible) before the finalization of the problem solution tree.The problem solution tree indicates various reasons or causes responsible for the specific problems and it will assist PRA team to plan about the suitable interventions or suggestions which will help in solving the identified problem(s). In problem solution tree, problem is stated at the top while causes are stated below it and possible solutions or research interventions are also stated besides each cause.

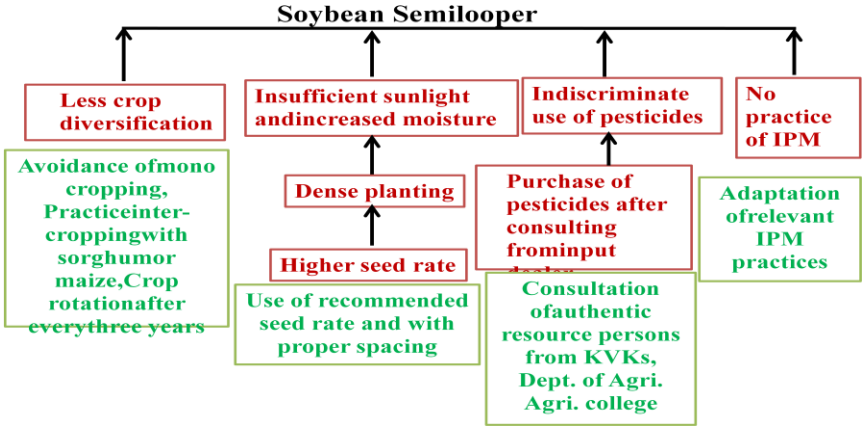


Fig. 10, Problem solution tree for Soybean semilooper in X village

So, based on the problem prioritization and problem solution tree PRA team have to identify the Research gap and Extension gap in agriculture and allied in a village.

As an example;

Research gap; a. development and design of small hand tools for hilly farmers.
b. development of short duration soybean varieties with less water requirement.

Extension gap; a. Poor knowledge about IPM practices
b. Poor interaction between rural agriculture extension officer and farmers

ACTION PLAN:

Based on the problems and research gaps identified some action plan for each identified problem need to be identify by the concerned PRA team, here for discussion key informants from village may refer.

As example,

What	Who	When	Where	How	Outcome
Migration of youth	Specialists in Mushroom cultivation, piggery, poultry, fishery etc.	2021-2023	ICAR RC NEH	Training youth on small scale agricultural enterprises, help them in improving their livelihood and to stop migration	Youth engaged in farm activities and reduction in migration

Annexure-I

Name: **Village:** **Mob. No.:**

Interview Schedule for
Conducting Benchmark Survey/ Pre-intervention Data

A. SOCIO-ECONOMIC PROFILE OF RESPONDENTS (Put tick mark where necessary**)**

(**a.)Age:** …… *(in years)* (**b) Male/ Female**
(c.)Housing type*: Kachha or tin shaded/ Pakka with RCC/ Pakka with modern amenities*
(d.) Education : Illiterate/ Primary/ Secondary/ Higher Secondary/ Graduate & Above
(e.) Family type : Nucleur/Joint **(f.)No. of family members:** ……
(g.) Employment generation status (Which enterprises are you and your family involved in the whole year?)

Farming Sectors	**No. of Man days/ annum**	**Non-Farm Sectors**	**No. of Man days/ annum**
Agriculture		Service	
Animal Husbandry		Business	
Fishery		Labour	

(h.)Possession of Assets:

Farm Assets		**Household Assets**	
Type of implements	**Number**	**Type of appliances**	**Number**
Power tiller		TV	
Mould Board Plough/ Cultivator		Radio	
Seed Drill		LPG Gas	
Seed cum Fertilizer Drill		Smart phone	
Mechanized Weeder		Refrigerator	
Water pump		DVD Player	
Sprayer		Air Condition/Air Cooler	
Thresher		Car	
Knife		Auto	
Spade		Motorbike	
Sickle		Others	
Etc./ Other implements			

(i.) Cropping Pattern (List the crops cultivated by you during last year in different types of lands such as Jhum Land, Upland, Low land):

Summer & Kharif season				***Rabi season***			
Name of crop and varieties	**Area (ha)**	**Prod. (Qt.)**	**Income generated (Rs.)**	**Name of crop and varieties**	**Area (ha)**	**Prod. (Qt.)**	**Income generated (Rs.)**
Rice				*Pea*			
				Cabbage			

Ginger				*Cauliflower*			
Turmeric				*Broccoli*			
Bottle gourd				*Tomato*			
Pumpkin				*Potato*			
Chilli				*Capsicum*			
Cucumber				*Mustard*			
Yam				*French bean*			
Maize				*Lettuce*			
Bitter gourd				*Onion*			
Brinjal				*Garlic*			
Sesamum				*Radish*			
Pointed gourd				*Turnip*			
Sponge gourd				*Carrot*			
Groundnut				*Beet root*			
Soybean				*Others*			
Others							

Types of enterprises which are Perennial in nature

Farming enterprise	**Area (ha.)**	**Production (Qt.)**	**Income generated (Rs.)**	**Farming & allied enterprise**	**Area (ha.)**	**Production (Qt.)**	**Income generated (Rs.)**
Pineapple				*Poultry*			
Orange				*Piggery*			
Banana				*Goatery*			
Tea				*Fishery*			
Arecanut				*Cattle*			
Betelvine				*Broomgrass*			
Black pepper				*Others*			

(j.) Income generated annually from other non-farm sectors (in Rs.)?

Services (Govt./Private):	
Business (Shop/ Taxi/ Others):	
Labour Services (Job Card/Carpentry /Others):	

(k.) What do you do with the agricultural wastes of different agro-enterprises?

Vermicomposting/ Recycling as input for other agri-enterprise/ Throwing as waste/ Composting/Others

(l.)What is your most preferred Agril. & Allied Enterprises (Rank accordingly) and what kind of assistance do you need from different extension service providers? (Inputs/Training/Market linkages/ etc.)

Crop Husbandry	Rank	Nature of assistance	Allied	Rank	Nature of assistance
Rice cultivation			Poultry		
Pineapple cultivation			Piggery		
Vegetable cultivation			Fishery		
Turmeric cultivation			Dairy		
Ginger cultivation			Goatary		
Arecanut cultivation			Mushroom cultivation		
Betel-leaf cultivation			Beekeeping/Apiculture		
Broomgrass cultivation			Others		
Banana cultivation					
Black pepper cultivation					
Tea cultivation					
Orange cultivation					
Others					

(m.)Rank the constraints faced in agriculture and allied:

Constraints for non-adoption or discontinuance of improved technologies	Rank
Lower productivity than conventional technology	
Cost of cultivation is too high	
Lack of timely availability of quality inputs like seeds/piglets/others	
Lack of support from the Govt. Departments/ ICAR Institutes	
Lack of skill based training on improved technologies	
Lack of awareness of resistant varieties/ breeds against biotic and abiotic stresses	
Climatic aberrations causes severe damage to crops and other enterprises	
Lack of market demand/ less preferred for local consumption	
Lack of provision for buy back agreements with farmers for effective marketing	
Non-availability of storage and processing facilities	
Less preferred over the traditional varieties/ cultivar/ breeds	
Lack of sustainable mechanism for effective technology dissemination	
Any other (specify)	

(n.) What are the possible suggestions for improving adoption of improved agricultural technologies?

Note:

This interview schedule should use to collect data from individual farmers

Minimum 30 percent of total population of a particular village should covered in bench mark survey along with PRA activities.