

Cluster randomized control trial to test the impact of participatory extension delivery versus traditional extension delivery on adoption of agroecological practices and home garden farming methods

Training manual

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Introduction

This study aims to understand the impact of participatory extension approach on adoption of agroecological farming practices versus traditional extension approach among smallholder farmers. We assess how information delivered through different approaches impacts farmers' agroecological knowledge, the adoption rate of agroecological practices along with homestead-based farming models based on agroecological principles, and analyze its effects on agricultural, household, and individual outcomes.

To achieve this objective, we will use a cluster-based randomized control trial to randomly allocate households between three groups- those who receive information about agroecology in a participatory way, those who receive information about agroecology in a traditional way, and those who practice business as usual. This study is undertaken in Narayanganj block of Mandla district in Madhya Pradesh, India.

This study is being pursued by the International Food Policy Research Institute (IFPRI) under the CGIAR's Multifunctional Landscapes Program¹ with support from PRADAN (Professional Assistance for Development Action)², Kabil Professional Services Private Limited, advice from International Water Management Institute (IWMI), and with inputs from other partner organizations. The objective of the study is to answer the following research questions:

RQ1: What is the impact of participatory and traditional extension methods on adoption of agroecology practices among smallholder farmers in Mandla?

RQ2: To what extent does giving resource support such as seeds improves the impact of any extension?

RQ3: Which extension method is more beneficial for adoption of agroecological practices- participatory or traditional?

And broadly, we test the following hypothesis:

Hypothesis: $AE_{participatory} > AE_{traditional}$: Information delivery through participatory extension approach increases the likelihood of adoption of agroecological practices than traditional extension approach.

This report provides a summary of the study design and a detailed explanation of the key steps that were adopted in farmer training of different treatment groups.

¹ <https://www.cgiar.org/cgiar-research-portfolio-2025-2030/multifunctional-landscapes/>

² <https://www.pradan.net/>

Experimental design

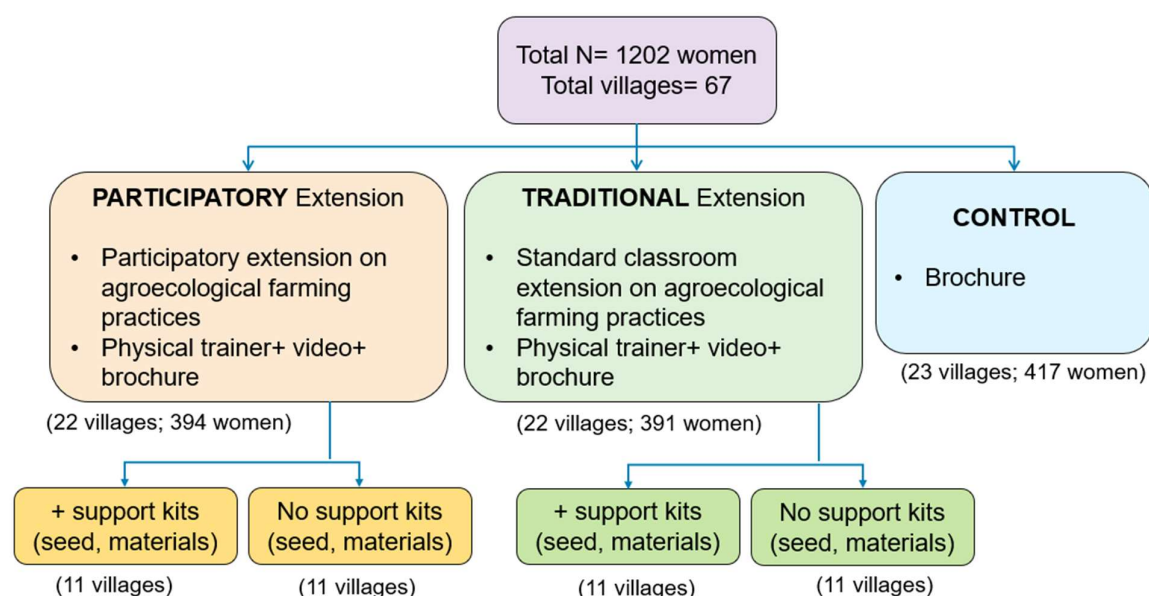
This study involves a cluster randomized control trial (CRCT) to study how information delivery through a participatory approach could impact the likelihood of adoption of agroecological practices as compared to traditional information delivery mechanisms.

The villages were divided into three groups: control group and two treatment groups- treatment group 1 (T1) and treatment group 2 (T2). In T1 group-participatory extension group, farmers received information about agroecology and homestead farming models in a participatory process. This involved following key steps to engage the participants in a process of envisioning if agroecology can help them achieve their goals. Whereas in T2 group- traditional extension group, farmers received information about agroecology and homestead farming models in a traditional classroom style process.

In both treatment arms, farmers were shown a video on homestead farming model and given a brochure to take home summarizing key points from the training. In control group, farmers did not receive any training but were just given the brochure on homestead farming models (same as in treatment groups).

Apart from this, in T1 and T2, 50% villages were randomly selected in each of them where all the sampled farmers in that village would be distributed support kits to facilitate their adoption of the agroecological practices prescribed in the training. The support kits comprised of a seed-mix of vegetable crops, materials such as wires to construct the multilayer farming structure on the farm, bio-inputs such as Trichoderma, and pest traps like pheromone traps, sticky traps for effective pest management.

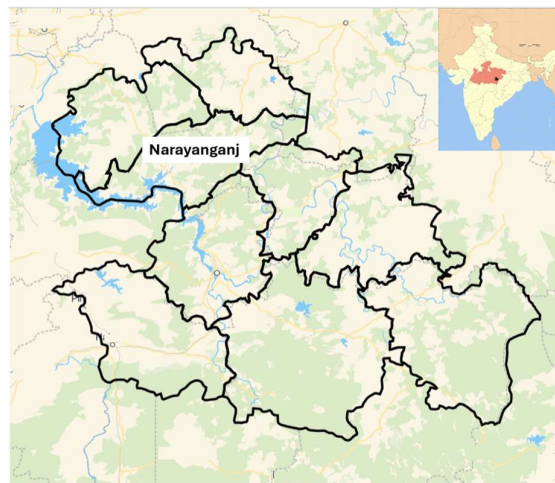
Figure 1: Experiment Design



Sampling

The study was implemented in Narayanganj block of Mandla district. Mandla offers a comprehensive study of agroecology with distinctive features including nearly 50% of land under forests, majority of population engaged in agriculture and home to predominantly tribal groups dependent on fringe forests for their livelihoods. However, the district is prone to the adverse impacts of climate change mainly due to drought, rising temperatures or extreme heat events, with prolonged scarcity of rainfall as the predominant concern.

Figure 2: Sampled block



This has led to suboptimal land utilization, inadequate farming techniques, overgrazing of pastures, limited capital investment, and a scarcity of production inputs. Agroecological systems more suited to such context could help mitigate these climate shocks (Koochafkan et al., 2012; Altieri et al., 2015) where building resilience is extremely important.

Within this block, 67 villages were randomly divided into participatory extension treatment, traditional extension treatment and control group from a list of total villages received by PRADAN.

Within each village, 18 households were randomly selected for the intervention and in total 1202 households interviewed for baseline survey in June-July 2025. Only those households were selected where a woman was working with PRADAN. In each household, we surveyed a woman who had previously worked with PRADAN, or is a member of a women's self-help group, and a primary male decision maker in the household who was mostly husband of the female respondent.

Training of trainers

We conducted two rounds of training of trainers (ToT) and field testing of the training module to adjust the language, steps and content. The training of trainers was conducted at PRADAN office in Narayanganj. The trainers comprised of 4 PRADAN executives, 4 cluster-level coordinators (CCs) of PRADAN, 10 community resource persons (CRPs) and two notetakers. After explaining the training to trainers, we tested it with farmers of Devrikala village in July 2025 and Mukaskala village in August 2025 (which are outside of our sampled villages).

The ToT was conducted over 2 days of classroom-based training each time, in which the trainers were explained the objective of the study and step-by-step guidance on conducting each step of farmers' training in the final intervention.

The main responsibility of PRADAN executives was to conduct the training as main trainers, CCs and CRPs were expected to facilitate the group-level discussions during final interventions, facilitate writing/maintaining record of key points discussed during group-activities, keep track of and engage the participants during the training. The notetakers were primarily entrusted to observe the conduct of the training, inform the trainers if any information was missed out during the training and maintain attendance of participants on training days. However, everyone was given information about all steps to support all activities and tasks during the training if needed (beyond their key responsibilities).

Box 1: Common instructions for all trainers

- Read all training material properly and revise it thoroughly
- In case of any confusion, ask PRADAN
- Don't ask leading questions
- Ensure everyone in the group is participating
- Don't give any answers/ solutions yourself
- During group discussions, check with PRADAN trainers and notetakers

Steps in training

This section shows a step-by-step guide on how the intervention was carried out with farmers in each treatment group.

Treatment group 1: Participatory extension treatment group

Step 1: Introduction

In this step, the trainer was asked to give an introduction about the objective of the training, planned activities for the day and house rules. This was followed by the introduction of every person present in the training- the trainers, notetakers, CRPs and the participants to each other:

“Today we have come together to talk about our life, our dreams, our farm and our village. We are going to discuss about how to choose those farming practices which are sustainable and help us meet our present goals as well. We will discuss about agroecology farming, which is a nature friendly way of farming. We will make smaller groups and engage in discussions. We will also have breaks in between to ensure we are not tired.”

Step 2: Visioning (making dreams for next 5 years)

In this step, the trainer asked the participants to make a vision themselves for next 5 years that they want to achieve. They were asked to reflect deeply on the desired or ideal future state of their farm, livelihoods, community, and environment that they wanted to achieve by 2030. For instance, they were asked to reflect on aspects that directly relate to their life such as their farm, their sources of income, the future of their children, personal aspirations, household nutrition (figure 3), village level aspects such as the status of natural resources, village infrastructure, and social issues that are relevant at the community level. Moreover, they were asked to make these dreams, assuming absence of any immediate or long-term constraints such as money, water, labour, etc.

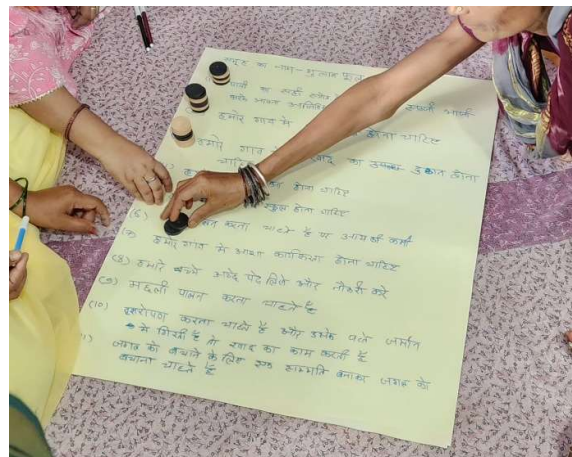
“Imagine your life, farm and village five years from now (2030). Forget about any constraints or challenges that you are facing right now. What do you see? What is your dream?”

To do this exercise, the whole group was divided into 2 small groups with 5-6 people wherever possible. Each group was given a playful name to ensure entertainment of the respondents. Participants were asked to discuss within their group and then write or draw sketches or maps of their dream village (life and farm) on colored charts. Each group was supported by a CRP or trainer to facilitate the discussion.

Focus on the things which are realistic and can be achieved within the next 5 years. If less than 5 items are important to you then you can use that many coins.”

To do this exercise, each group (as formed in step 1) was given with 5 carrom coins. And each person was asked to vote for their top 5 dreams using the coins. The total votes against each item in the list of votes was then calculated and out of this list, major 5-6 dreams which had received the maximum votes were selected. All subsequent discussions were undertaken based on their major dreams.

Figure 5: Voting for major dreams



Step 4: Identify constraints and solutions in meeting Major Dreams

In this step, each group was asked to discuss the barriers and constraints preventing the community from achieving their prioritized dreams (as identified in step 3) and how we can move past them. They were asked to think about the solutions to these constraints. This cognitive exercise enables the participants to be the change-makers by thinking about solutions themselves. In most of the discussions, this translated to thinking about the collective power of women groups, men with women, and village level collectivization strategies.

“Now, we will reflect together on something very real: what is stopping us from achieving the major dreams identified before? Is the problem related to time, money, water, land, or knowledge? Are there any external challenges—like market prices, government rules, or lack of support? Are there seasonal difficulties that affect this? Is it about family labor or workload? How can we solve these challenges?”

Each group discussed this for every major dream and wrote their points of discussion on a chart paper. A facilitator helped in the discussion.

Figure 6: List of major dreams, constraints in meeting these dreams and solutions to meet these dreams, Patha village

गोंब - पाठा समूह - नर्मदा 25.09.2025
मुख्य स्वप्ने

बाधाएँ	समाधान
① खेतों में पानी की पहुँच बेसी नहीं है	(1) पंचायत से मदद लेना। विजली विभाग से को आवेदन देना।
② स्कूल में बिनाक होना चाहिए और 12 की तक स्कूल लगे	(2) प्रोपल में शिक्षक विभाग से मदद लेना आवेदन देना।
③ खसकी की खेती हर मौसम में करना है।	(3) कृषि विभाग से मदद लेना
④ जमीन समतली करना होना चाहिए	(4) जमीन समतली करण के लिए ज़ायते के लिए सरकार से मदद लेना है।
⑤ गोंब या आसपास रोफ़ाट होना चाहिए	(5) जनसद में आवेदन देना।

Before moving to the next part of the training, each group presented their charts to the other group explaining their major dreams, constraints and solutions that were discussed. In most cases, the discussions highlighted many common issues across the 2 groups and thus helped in ensuring consensus among the participants.

The discussion so far has been crucial since it was used in the next steps of the training, to help them relate with how agroecology and the technical training on homestead farming can help them achieve their dreams, provide a solution to their problems in meeting their dreams, etc.

Step 5: Current nature friendly farming practices

In this step, the objective was to draw attention to existing nature friendly, indigenous and traditional farming practices that are practiced by or known to the community but often go unnamed or undervalued. This step was mainly for the trainers to transition towards the discussion of nature-friendly farming practices which form the basis of subsequent training steps. It was also a quick learning step for all participants where they got to know about different traditional practices people are practicing in their village.

One or two farmers were asked to share their memories of past practices to start conversation and how it compares to current practices. Note this was not a group exercise, but an open discussion.

“What are your farming practices currently? Which crops do you grow, what inputs do you use, and what do you do with your agricultural produce? What are some local or traditional

practices you use to grow food or raise animals? What are their local names- for example local festivals like Bidri, etc.? What is their benefit?"

Figure 7: Examples of some traditional farming methods



Step 6: Discussing about climate change

In this step, the objective was to give an introduction about climate change and how the homestead model can help in meeting climate issues. It involved asking the participants what changes they have observed in their surroundings and natural environment over the years and how this has affected their farming practices, yields, and overall experience. Again, this was an open discussion with all the participants and was kept mainly for facilitators to transition towards the discussion on agroecology. Step 5 and step 6 were sometimes interchanged in order depending upon the flow and requirement of the training.

“Have you noticed any change in climate over the last few years? For example, is there any change in rainfall timing, amount of rainfall? Occurrence of droughts or floods? Do you think there is any change in temperature?”

“Due to these climate changes, it is impacting our natural resources like water, land, forests, etc. And we need to optimally utilize them.”

Step 7: Introducing homestead farming model

In this step, the trainer introduces the homestead farming model to the participants. Specifically, they are given an introduction about the 5 components of the model -multilayer farming, livestock farming, water reservoir, compost unit and bio-inputs. Apart from this,

additional on-farm practices were covered such effective pest management using sticky traps, pheromone traps and flower crops as border crops, and intercropping on multilayer farm.

Moreover, the trainer links this part with the previous discussion had so far- including that on dreams, constraints, solutions, climate change and nature friendly farming practices. It is the trainer's duty to pick the relatable threads from previous discussion. For example, in step 2, many farmers mentioned about growing vegetables in their homesteads so that everyone can get good nutrition as a dream. The trainers can link this to multilayer vegetable farming and how this can help in achieving their future goals and dreams.

“The ideas you’ve shared are already part of homestead-based farming systems which some people have demonstrated in Mandla. It’s a way of turning a small space around your home or in your backyard into a productive and nourishing system. You can grow vegetables, fruits, keep chickens or goats, make compost, and save water- all in one place. You don’t need a large farm, just a willingness to start small and build gradually. It is one such way of doing farming keeping in mind environment and by optimally utilizing our available resources. It is based on the principles of agroecology farming which is a nature-friendly farming method.

This homestead farming model has 5 components:

Figure 8: Multilayer Vegetable Patch with creepers, leafy vegetables, root crops, and fruit trees



Figure 9: Water reservoir to store water for irrigation



Figure 10: Livestock Enclosure for small ruminants such as poultry, use of local bamboo for shelters



Figure 11: Compost Unit: A better way to make compost using crop residue, animal dung etc.



Figure 12: Bio-inputs for effective pest and fertility management



Figure 13: Pest management a) Growing flowers as border crop



Figure 14: Pest management b) Pheromone and sticky traps



Step 8: Showing video on the homestead farming model

After the introduction about the model, the participants were shown the video on this model and how it functions: <https://www.youtube.com/watch?v=PNKpzU5immA>

Figure 15: Screenshot of video shown to participants



This video was shown using a video projector on a medium screen. The participants were asked if they had any questions about the video and the trainers provided an explanation for them. Many times, steps 7 and 8 were interchanged in order depending upon flow and requirements of the training.

Step 9: Technical information on homestead farming model

In this part, PRADAN staff gave technical training on the components of the model. It was difficult to describe everything in detail in one training, so the trainers focused on major points only, with the understanding that farmers will gain a better understanding of functioning of the model only when they start doing it. This technical training was given using a medium screen projector. The details on information covered on each component of the model is given in Box 2 in appendix. The technical training comprised of the following elements:

1. Information on each of the 5 components of homestead model mainly focusing on how each component is made, how much time it takes to build it, materials required for construction, and its benefits.
2. Rough idea about the average income that could be earned by practicing all the above activities on homestead. This was based on experience of previous adopters of the homestead farming model and varied across villages. This was crucial information since it directly related to the economic returns from these practices. Many farmers in step 1 of the participatory extension spoke about having a dream of stable income, or in step 3 spoke about lack of money or sustained income as a constraint in meeting their dreams. Thus, information on income could have been useful to farmers in determining whether to adopt the practices mentioned during the training or not.

Table 1: Income from home-garden farming model

Village name	Average income per season
Kondra	INR 35313.34
Kunda	INR 31458
Dargarh	INR 30922.5
Jujhari	INR 20892

Source: PRADAN's own assessment of fields where home-garden model was implemented

3. Unlike field crop farming (rice, wheat etc.). which are harvested only at the end of the season, vegetable crops recommended in the multi-layer farm had varied maturity dates which could make tracking harvest cumbersome. Therefore, it was

recommended to maintain a diary at home in which one keeps timely track of harvest of each vegetable on multi-layer farm, how much was consumed, how much was sold at what price, any transport cost incurred etc., to fully understand the gains from this practice.

Figure 16: Copy of diary of a farmer, maintaining record of harvest and its use from multi-layer farm

दिनांक	सब्जि	मात्रा	दर	मूल्य	टिप्पणी
11/3/25	टमाटर	15 kg	14.00	210	
	ब्रिंजल	10 kg	20.00	200	
	लडकियाँ	5 kg	60.00	300	1000
	अनार	3 kg	60.00	180	
12/3/25	टमाटर	5 kg	40.00	200	
	ब्रिंजल	5 kg	40.00	200	
	लडकियाँ	5 kg	60.00	300	300
	अनार	3 kg	60.00	180	
13/3/25	लडकियाँ	50 kg	50.00	2500	
	अनार	30 kg	30.00	900	
	ब्रिंजल	30 kg	40.00	1200	11600
14/3/25	टमाटर	11 kg	14.00	154	
	ब्रिंजल	9 kg	20.00	180	690
	लडकियाँ	10 kg	20.00	200	
15/3/25	लडकियाँ	5 kg	50.00	250	
	अनार	15 kg	50.00	750	640
16/3/25	लडकियाँ	5 kg	50.00	250	
	अनार	1 kg	800.00	800	950
17/3/25	अनार	11 kg	100.00	1100	
	ब्रिंजल	6 kg	350.00	2100	11350

Step 10: Agroecological principles that are linked to homestead farming model

In this step, the trainer explains the agroecological principles that are linked with this model. The aim of this step was not to use any technical wordings but explain agroecological linkages in the simplest possible ways. The trainer then explained how the model achieves the following things:

- Recycling of farm waste and animal waste for making bio-inputs.
- Improving animal health by feeding chemical free feed and maintaining shed.
- Improving soil health by using bio-inputs on multi-layer farm and not adding any chemical inputs.
- Diversification of income sources on the same farm through poultry farming and multilayer farming.
- Input reduction on farm using only self-made inputs and limiting use of external inputs.
- Synergy between various on-farm activities.
- Participation of women and men in the household is important to ensure these practices are adopted.

- Maintenance of social values and diets
 - Eating green leafy vegetables and iron rich food helps in preventing anemia
 - This model helps with providing access to tri-colored meals: lentil, rice/ chapati, leafy vegetables
- Improving on-farm biodiversity
 - The crop diversity by growing multiple crops helps in improved income
 - Promotes spread of bees and butterflies which help in pollination

Step 11: Constraints, solutions and action plan for adoption of homestead model

In this step, we divide the participants again into two groups as before. The objective of this step is for participants to reflect on their current readiness to implement homestead model by identifying the constraints in adoption, what resources are available to them and what is unavailable, and what resources/ support are needed to overcome these constraints.

Each group discussed amongst themselves and the facilitator wrote major points for each farmer on a chart paper. This discussion was useful since it helped in planning regarding the further support that needs to be extended to each farmer. Specifically, we tried to understand which components the farmer is interested in adopting from the training, which resources they have which can help them construct the components they are interested in adopting, and which resources they don't. The trainer discussed about various resources such as assets (homestead land, ruminants for animal shed), access (to seeds, information, bio-inputs), assurance (of markets, govt schemes, farmer groups), ability (availability of household members to do homestead management, maintain diary), and attitude (own self-confidence to try something new). Additionally, they were asked what next steps they will take after today's training.

“Now, let's try to understand how we can start building our own homestead farm. We will discuss about various things which can help with doing that: Assets; Access; Assurance; Ability; Attitude

What would you have to do differently on your homestead than what you are doing now to reach the model you saw in the video?”

Figure 17: Resources for adoption of homestead farming: Assets



Figure 18: Resources for adoption of homestead farming: Access

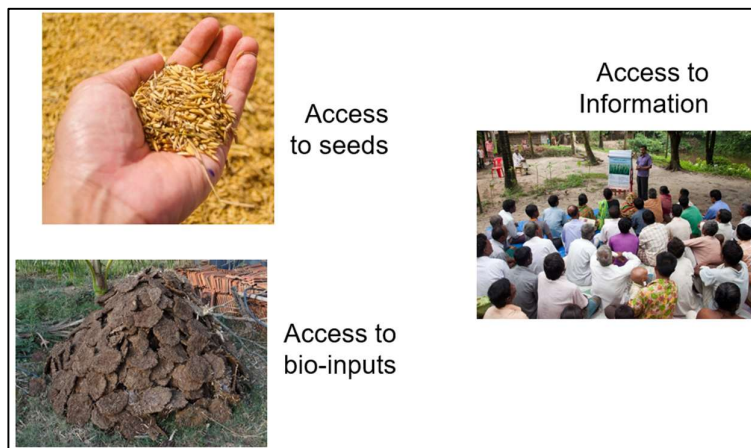


Figure 19: Resources for adoption of homestead farming: Assurance



Figure 20: Resources for adoption of homestead farming: Ability



Figure 21: Resources for adoption of homestead farming: Attitude

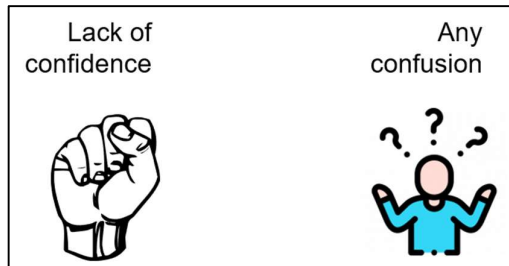


Figure 22: Example of an action plan made by farmers of Devri village

किसानों का नाम	मैं/उसने करने ?	क्या-क्या चाहिए ?	क्या-क्या नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
अभिषेक भारद्वाज	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
भागवती वारि भारद्वाजी	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
सुभानी भारद्वाजी	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
भागवती उदासी	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
सुमिया वारि भारद्वाजी	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
मेगो वारि भारद्वाजी	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
ममता भादव	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?
वसुधा भादव	हॉट-कमिनिगेशन - पशुपालन करने...	कमो-कमो आसानी है ? पशुपालन करने के लिए आसानी है।	कमो-कमो नहीं है ?	इसमें आसानी करने के लिए कि मद मिले या न मिले - क्या नहीं है ?

Step 12: How homestead model helps meet major dreams

In this step, the trainer encouraged everyone to think about whether the information given in the training helped in meeting the dreams and provided solutions to the constraints that were highlighted in the first few steps. The trainer referred to the information written on the charts for this purpose.

This step was crucial since it helped the participants to link the information with their long-term goals and thus impacted on their decision to adopt the practices covered during the training. The hypothesis under this cognitive exercise is that farmers who feel that they can meet their dreams through the practices taught during the training, will adopt them as compared to farmers who are not able to do this.

Treatment group 2: Traditional extension treatment group

In traditional extension group, the participants were given just the information about agroecology and homestead farming models. Unlike the participatory group, traditional extension group did not have any steps in which farmers had to engage in group discussions. Specifically, this training group only comprised of the following steps:

Step 1: Introduction

Step 5: Current nature friendly farming practices

Step 6: Discussing about climate change

Step 7: Introducing homestead farming model

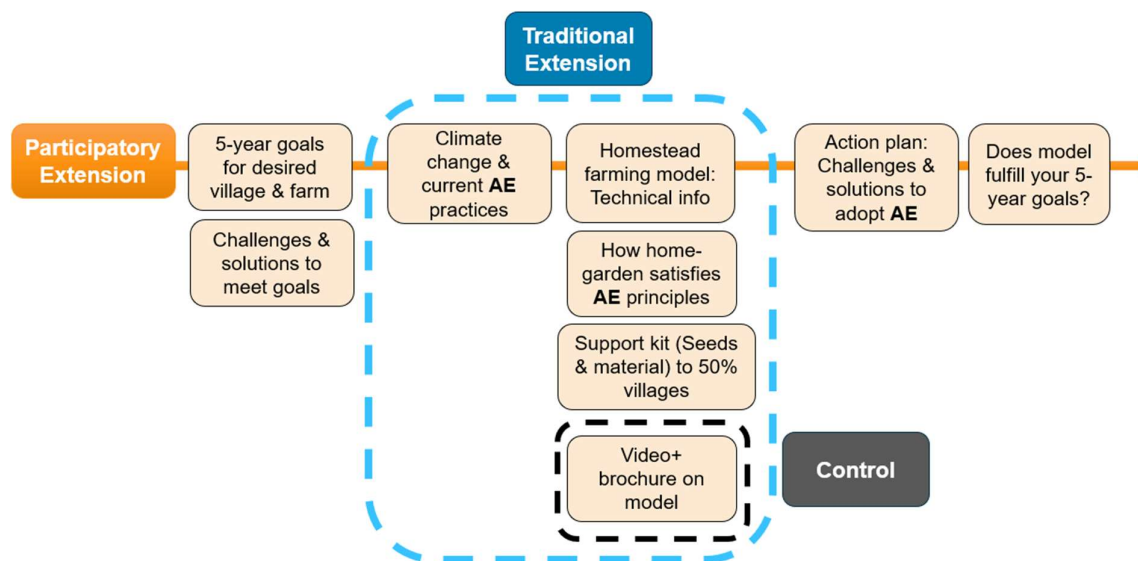
Step 8: Showing video on the homestead farming model

Step 9: Technical information on homestead farming model

Step 10: Agroecological principles that are linked to homestead farming model

The content of these steps remained the same as in participatory training group. Thus, the steps covered in traditional extension were a subset of the steps covered in participatory extension.

Figure 23: Difference between participatory and traditional extension



Additional elements

Brochures to take home

Along with physical training, all participants in participatory and traditional extension groups were distributed a brochure in Hindi language to take home, summarizing the exact information as explained during the training. See Box 3 in Appendix to see the brochures. They were also explained how to use the brochure and navigate the information using pictures. The brochure also had contact information for participants to contact PRADAN. Farmers in control group were also provided with just the brochures through the village CRPs.

Seed and material kit to support construction of multilayer farm

Out of 22 villages in each treatment arm- participatory extension and non-participatory extension, 11 villages were randomly selected in each group in which all farmers in that village were to be supported with support kits to help them construct the multilayer farm. The monetary value of these kits was INR 4000 (USD 45) and these kits were given free of cost. These kits comprised of a seed mix of vegetable crops suitable for most seasons, some wires to support the trellis structure, and a few items for pest management such as fly traps and bio-inputs.

For supporting bio-inputs and compost, PRADAN would provide further support to farmers who were interested in making them. Apart from that, the participants could be connected to the bio-resource centers from where they can buy these inputs. This again is a demand driven exercise provided to only those farmers who showed interest and contacted PRADAN.

Feedback form at the end of training

All farmers were asked to fill a short feedback form at the end of the training to gain insight on their experience with the training such as if they found the training to be useful, if the training was long, were instructions given clearly, in which steps did they find difficulty to understand, which steps did they enjoy most, if they have heard about the homestead farming model before, and if the training helped them to think about their goals or not (asked to only cocreation farmers). Farmers who could read and write were asked to fill in these forms themselves, whereas those who needed assistance were surveyed by notetakers or CRPs. We used paper forms for this purpose which were later converted into digital data using SurveyCTO survey forms. These forms were anonymized (we did not ask for respondent name while collecting this data).

Points to keep in mind

RCT requires significant measures to ensure that fieldwork happens as planned in the research protocol. Any deviation can impact the findings of the study significantly and hence, appropriate field planning needs to be done to prevent such scenarios. Following were some key strategies devised by the team to keep track of the progress of the intervention:

- Hire field managers independent of implementation partner: This helps in obtaining a 2nd opinion on ground situation (about interventions, participation etc.) especially when principal investigators cannot travel frequently
- Village wise tracking: We collected attendance of participants for each round and day of training, keeping record of who came, if participant was replaced by their friends/ family/ neighbor, etc. The attendance was first obtained through printed paper sheets, which was later converted into digital data using SurveyCTO survey forms. Moreover, since in participatory trainings respondents were asked to do group work and write on charts, these charts were used to track the nature of discussion and point out to any patterns.
- Village wise notes to track quality of the training: The presence of notetakers ensured that tracking progress of training was smooth. The notetakers kept records of conduct of training, total duration of training, and key points from the discussion wherever possible. These notetakers were hired outside of the NGO partner, so ensure there is no conflict of interest in the responsibilities.
- Regular monitoring to track progress and quality: It was imperative to regularly track the attendance sheets and feedback forms to gauge the overall progress of the training. The use of SurveyCTO forms made the management of this data easier.

- Regular monitoring and feedback meetings with implementation partner: Regular meetings with the entire team (researchers, NGO, notetakers and key CRPs) helps in resolving any issues or field matters and in effective planning for the training and post-training measures.

References

1. Altieri, M.A., Nicholls, C.I., Henao, A. & Lana, M.A. 2015. Agroecology and the design of climate change resilient farming systems. *Agronomy for Sustainable Development*, 35 (3): 869–890
2. Koohafkan, P., Altieri, M.A. & Holt Gimenez, E. 2012. Green agriculture: foundations for biodiverse, resilient and productive agricultural systems. *International Journal of Agricultural Sustainability*, 10(1): 61–75.

Appendix

BOX 2: Details about homestead farming model covered in the training

1. Multi-layer farming:

It involves growing different layers of crop on a single patch of land: some on ground, some using trellis farming. This can be done in homestead or any other land where you want.

Materials needed: Wire to support, fly traps, bamboo sticks, seed-mix, net or saree

Area: 10-15 decimals

Steps in constructing multilayer farm:

a. Create layout of homestead land



b. Create raised and trench beds to grow different crops



Make 8-12 raised bed of 1.2 meters width with a space of 0.3 meters between beds. Grow all crops on raised beds. Leave trenches empty. Raised beds are good for tubers and root crops like potato etc. especially in rainy season.

c. Making bamboo trellis and plot boundary

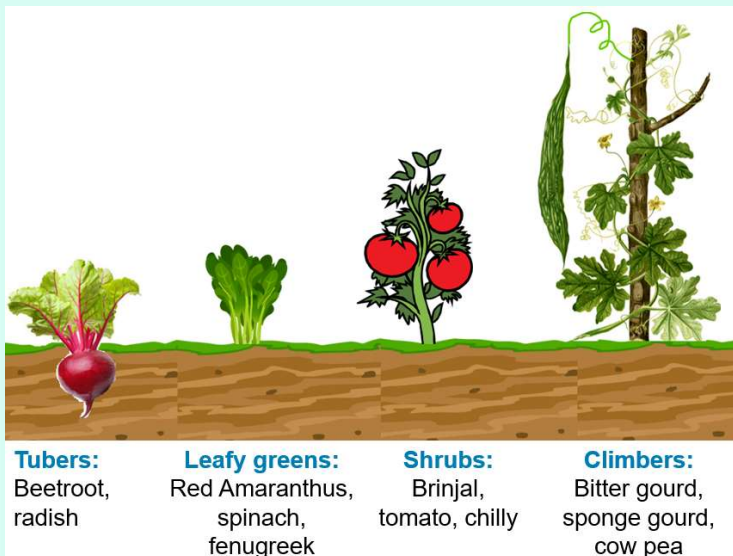


Benefits of trellis:

- Helps in growing crops both on land and in air using bamboo trellis
- More crops from same land
- Trellis gives protection from rain and direct sunlight
- Efficient water utilization
- Soil conservation

For plot boundary, you can use a saree instead of a net.

d. Crop selection and management



Growing different layers of crops helps in the following benefits:

- Helps in improving nutrition
- Access to fresh fruits & vegetables
- All-year harvest of vegetables → income

e. Management of multilayer:



Put flowers on boundaries of multilayer. Insects like wasps get attracted to these flowers and leave the crops.



Use sticky traps and pheromone inside the farm. They help to capture various insects like thrips, white flies, aphids and save main crops

2. **Water reservoir:**

It is created to store water which can be used for irrigating the multilayer and other fields if needed.

Materials needed: plastic lining,

Area: 10 x 10 x 7 feet

Steps in creating a water reservoir:

a. Make a 10 x 10 feet length x breadth and 7 feet deep pit



b. Create boundary using mud-cow dung mixture



c. Put plastic lining on top and fill with water; or collect rainwater



3. Composting:

Here we make compost using natural elements. For example:

- a. Shivansh compost (ready in 1 month)



- b. Nadep (ready in 3 months)



Further details were included about to exactly create these composts ste-by-step which we have excluded for brevity.

4. Animal Shed

This involves creating a shed of poultry or goats. It helps in increasing income and provides raw material for creating compost.

Materials needed: net, bulb, wooden polls

Area: 14*10 feet area

Benefits of keeping animals in a shed:

- Shed protects animals from theft
- Easy collection of dung for making compost
- Better feed management
- Possibility to keep more chicken in a poultry farm
- Prevents diseases in animals
- Helps in improved health and sale of animals which increases income



Steps in making poultry shed:

- a. Marking the land



b. Creating boundary



c. Levelling the floor



d. Putting the gate



e. Putting bulb in the shed



Management of poultry:

- Keep the shed clean
- Give healthy feed such as crop leftover from multilayer farm, corn, dry fish
- Deworming
 - Helps to eliminate internal parasites
 - Promote bird growth
 - Improve egg production
- Vaccination
 - Prevents diseases such as Ranikhet
 - If any chick is sick, keep them separately from the rest.

5. Bio-inputs

- Made using natural elements and easily available material at home (cow dung, cow urine, certain leaves, etc.)
- Used in place of chemical fertilizers, pesticides and insecticides
- Three main bio-inputs covered in the training include:
 - a. Jeevamrit- used as a fertilizer



b. Agniashtra- used as insecticide



c. Beejamrit- for treating seeds



Along with the above, information was provided on material needed and preparation method of the three inputs and in how much time it will be ready. Those details are again skipped from this report and can be provided upon request.

Box 3: Brochures on agroecological practices and home-garden farming model (in Hindi)

बाड़ी मॉडल का प्रशिक्षण



**बाड़ी-आधारित
खेती मॉडल**





बहु-स्तरीय खेती/ मचान खेती



बाड़ी का लेआउट



खूटा गाड़ना



**ढलान की दिशा में 6 फीट
और दूसरी दिशा में 5 फीट**

स्थलों की सफाई और मिट्टी को समतल करना | 10 डेसीमल के फार्म का लेआउट बनाएं | बांस के डंडों को इकट्ठा करें और चिह्नित स्थानों पर सीधा रखें (6*5 फीट)।



**4 फीट की क्यारी की तैयारी
(1 फीट की नाली)**



**मचान को लकड़ी और तार से
बुनना**



फसल चक्र का चयन

मचान को पॉलिमर तार एवं जी आई तार से बाँधें | 4 फीट का चौड़ा बेड बनाये एवं बेड के बीच 1 फीट की नाली रखें | एवं चारों तरफ से हरा नेट/ कपड़ा लगाये | मौसम के हिसाब से सभी स्तर की फसलों का चयन करे

फसलों का चयन

जड़ वाली
सब्जियाँ:
चुकंदर, मूली



पत्तेदार भाजी:
लाल भाजी, पालक,
मेथी, धनिया



सब्जियाँ:
टमाटर, बैंगन,
मिर्च



बेल वाली सब्जियाँ:
करेला, तुरई, बरबटी

- खेत की तैयारी एफ वाई एम खाद/ वर्मी/ शिवांश खाद से करे | बीज का उपचार बीजामृत से करे
- उपज बढ़ाने एवं पौधे के विकास के लिए जीवामृत का प्रयोग करे
- कीट से बचाव के लिए अग्नि अस्त्र का प्रयोग करे



मचान खेती से किसान कम ज़मीन में चार गुना फसल ले सकते हैं जिससे किसान की आय बढ़ेगी, मिट्टी के पोषण का बेहतर उपयोग होगा, एवं पानी की भी बचत होगी | परिवार की विभिन्न प्रकार का पौष्टिक भोजन मिलेगा



रोग एवं कीटों पर नियंत्रण



कीटों को पौधे से बचाने एवं दूसरी तरफ़ आकर्षित करने के लिए स्टिकी ट्रेप (चिपचिपे जाल) एवं फेरोमोन ट्रेप का प्रयोग करे



गेंदे के फूल को मचान के चारों तरफ़ लगाने से कीट उसकी ओर आकर्षित होते हैं जिससे पौधों का कीटों से बचाव होता है

जीवामृत



उपरोक्त सामग्री को एक छोटे ड्रम में मिलाएं, लकड़ी से घड़ी की दिशा में घोलें, और कपड़े से मुह बॉंध कर रख दें। रोजाना सुबह शाम घड़ी की दिशा में घुमाएं। 6 दिन में कपड़े से छानकर इस्तेमाल करें।

बीजामृत



मिश्रण को अच्छी तरह से हिलाएँ और 24 घंटे तक किण्वन होने दें। इसे दिन में 2 से 3 बार हिलाएँ। फिर पोटली को निचोड़ें और मिश्रण को छान लें। आपका बीजामृत अब उपयोग के लिए तैयार है!

अग्नियास्त्र



सभी सामग्री को मिट्टी या एल्युमिनियम के बर्तन में लें। मिश्रण को बार-बार घुमाते हुए मात्रा कम होने तक उबालें। 24 घंटे के लिए छाया में रखा है। ठंडा होने के बाद इस मिश्रण को छान लें। (अग्नियास्त्र) को प्लास्टिक की बोतल में रखें

जैविक खाद



ऊपरी परत को गोबर से लीपना है। पानी का नियमित छिड़काव किया जाना चाहिए। खाद 120 दिनों के बाद उपयोग के लिए तैयार हो जाती है। मचान की खेती में इस खाद का प्रयोग करें

शिवांश खाद



स्थान का चयन



ढेर का आकार



21 तसला ताज़ा गोबर



63 तसला सूखा कचरा (कटा हुआ)



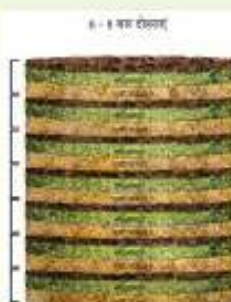
42 तसला हरा कचरा (कटा हुआ)



सूखे कचरे को गीला करें



सूखे कचरे में- 1.5 तसला, गीले में-1 तसला, गोबर- .5 तसला पानी



पन्नी से पूरा ढकना



4 दिन बाद निचोड़ परिक्षण



सही नमी होने पर परत को पलटें और फिर से ढेर बनाएं



18 दिन बाद



खडी फसल में

खाद का प्रयोग



पौधों की रोपाई के समय

जलकुंड



10*10 वर्गफीट माप का लेआउट तैयार करना



तैयार लेआउट को 7 फीट गहरा खोदना



गाय के गोबर और मिट्टी के मिश्रण को मिला कर बने हुए गट्टे के चारो तरह मेड में छपाई कर दी जाती है

- जलकुण्ड बारिश के पानी को रोक कर सिंचाई करने के लिए उपयोग किया जाता है।
- 10*10*7 घन फीट माप के जलकुंड में 19820 लीटर पानी रोकने की क्षमता होती है
- एक छोटे पंप की मदद से बहु-परत/मचान में फसल उगाने के लिए पानी की सिंचाई की जा सकती है



पत्ती डाले एवं आस पास की मिट्टी को समतल करे

मुर्गीपालन



घर के पास जगह का चुनाव



14*10 फीट जगह चिन्हित करना



जमीन से शेड निर्माण करना

शेड बनाने के लिए घर से लगी दिवार या घर के पास जगह को चूने की मदद से चिन्हित करें। चारों तरफ 1.5 फीट की दीवार बनाएं और कोनों में लकड़ी या लोहे का पोल गाड़ें



समतलीकरण



जाली और गेट लगाना



गर्मी के लिए बल्ब लगाये

तैयार शेड में मुर्गी पालें और रोजाना सफाई करें. देखरेख के लिए नियमित टीकाकरण और क्रिमिकरण करवाएं ताकि अधिक से अधिक आमदनी हो | पोल्ट्री से आय बढ़ेगी होगी और पोषण मिलेगा



बहु-स्तरीय खेती फसल का उत्पादन

आय में वृद्धि:

मचान खेती से किसान दीदी एक वर्ष में 1 लाख रूपए कमा सकती है। और मुर्गीपालन से 8-10 हज़ार रूपर कमा सकती है।

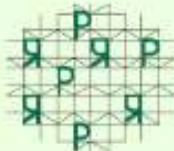


निम्नलिखित सेवाओं के लिए संपर्क करें

- बाड़ी मॉडल बनाने हेतु सामग्री
- सब्जी बीज
- सब्जी नर्सरी पौधे
- उत्पादन की सब्जी की खरीदी, बिक्री

सहूलत महिला फार्मर प्रोड्यूसर
कम्पनी लिमिटेड नारायणगंज
संपर्क नंबर: 7879753407

*अन्य किसी भी सवाल या सहायता के लिए, अपनी सी. आर. पी. दीदी को संपर्क करे गाँव या प्रदान संस्था में संपर्क कर नारायणगंज



Prepared by: Team Narayanganj



CGIAR

MULTIFUNCTIONAL
LANDSCAPES



प्रदान
Pradan