



## Profiling Village Economies, Assessing Climate Change, Ecological & Livelihood Crises and Evolving Response

### *Participatory Landscape Assessment at Kantasole Panchayat, Dumriya, East Singhbhum (Jharkhand)*

Kalamandir has been working in Kantasole Gram Panchayat for some years. The Gram Panchayat is chosen as one of the sites under the *'Regenerative, Climate Resilient and Productive Landscapes'* program.

The project aims at achieving 'sustainable transitions' in different agroecological contexts. A critical strategy in this direction is working with the community to help them assess their landscapes with respect to the ecology and local circular economy. The knowledge and lessons from the assessment should help them identify areas for improvement and seek solutions to improve their production systems, resource

utilization and local circular economy without compromising or harming the ecology.

#### **ABOUT THIS REPORT**

Outlines the process steps and outputs from a set of participatory exercises conceptualized and tried out in the Kantasole Gram Panchayat with community for 3 days from 27th to 29th December 2022 by a team from WASSAN along with the Kalamandir team and local community.

*The primary aim of the exercise is:*

- to develop a methodology and related tools for assessment of local landscape ecology & economy by the community
- to assess crises and opportunities

*So that response mechanisms for enabling ecological transitions may be evolved by the community and supported.*

This is an initial exercise that is expected to lead to setting up processes for community taking up various initiatives on the points of crises and opportunities.

## **PARTICIPATORY EXERCISES**

1. Participatory Landscape Assessment: Resource mapping using larger print of Google Earth map that helps in profiling the ecosystem- land use, crop systems, water bodies, forests etc.
2. Products of the landscape and income sources from various production systems.
3. Structure of consumption expenditure
4. Transect walk.
5. Reflection on the outputs of the exercises including sharing various options and models tried out in different places.
6. Meeting with community leaders (traditional tribal leadership) and plan of action for next steps and seeking their commitment to lead community action.

Also, the visual tool for taking snapshot views of the status of ecology & economy was tried out using the agroecology framework and TAPE tool<sup>1</sup> on the last day of

<sup>1</sup> Tool for Agroecology performance evaluation (TAPE)

the workshop. The first trial provided several practical insights into conducting such an exercise with the community. These will be used to improve the design of the visualization exercise.

## **EXERCISES & OUTPUTS**



### **[1] Participatory Landscape Assessment**

*(Participatory Rural appraisal with Google Earth village maps)*

Soon after basic orientation on the landmarks, the community took over the exercise- they identified and marked the village and habitation boundaries, important buildings such as schools, *angadwadis*, places of religious importance- sacred groves or *Jahers*, water resources such as wells, streams, farm ponds and farmlands as per land types. The group consisted of about 30 members from 5 villages of Kantasole Panchayat. The basic natural resources profile of the Kantasole GP landscape has been captured. A detailed mapping exercise needs to be further taken up to quantify.

The discussion led to indigenous classification of land use and the crop systems summarised as below:

### (a) LAND AND CROP TYPES

*(Land classification, use and cropping systems across the year)*

LAND TYPES	KHARIF	RABI	DURATION	RESPONSE
Don 1	Paddy	-	3 months	<ul style="list-style-type: none"> <li>Rice for yearly consumption saved some portion sold after that as per need</li> </ul>
Don 2	Paddy	Mustard, wheat, tomato, brinjal, bitter gourd, maize, cabbage, cauliflower, chana, teesi (flax), masoor		<ul style="list-style-type: none"> <li>Mustard-not sold outside (cultivation &amp; produce seems very low).</li> <li>Wheat- Earlier farmers used to grow more wheat, which has reduced in recent years, mostly cultivated for self-consumption.</li> <li>Chana, flax seeds, and masur are cultivated for self-consumption.</li> </ul>
Don 3	Goda Dhan	Vegetables (if access to water)	60 days crop	<ul style="list-style-type: none"> <li>Goda Paddy, 60-70days crops are mostly cultivated in <i>Don 3</i>.</li> </ul>
Tand	Grazing animals			<ul style="list-style-type: none"> <li>Kulthi, arhar, cultivation possible but left fallow for grazing animals.</li> </ul>
Badi	Maize, yam, arhar, bhendi, sem, lauki, saag, mirchi, seasonal vegetable		Till Feb	<ul style="list-style-type: none"> <li>Vegetables are cultivated mostly in homestead land for household consumption.</li> <li>Vegetables – consumed also and sold also</li> </ul>

*Once the mapping exercise is complete, these areas will be estimated using GIS.*

- The GP has predominantly paddy land; lowland (Don 1) and midland (Don 2) during Kharif – both are terraced and have single crop. Excess moisture is an issue in Don1 land and lack of irrigation is an issue in Don2.
- The larger valley terrain led to terraced lands of paddy while the hill slopes are with the Forest Department (mainly Sal forests). The upland paddy and cultivation of Tanr (up) lands are receding in recent years – and mostly left

fallow. Fallow lands are to be mapped in the detailed resource mapping exercise.

- Mustard, wheat, pulses, and vegetables are cultivated in the midland (Don 2) during Rabi wherever water was available; mostly water lifted by diesel pumps from the stream running through the GP. This practice, however, seemed to be decreasing in recent years. Don 3 (terraced upland) and *Tand* (unterraced upland) were mostly uncultivated and used for grazing animals. Another important land type was the '*Badi*' (backyard) land where vegetables and some other crops are cultivated.

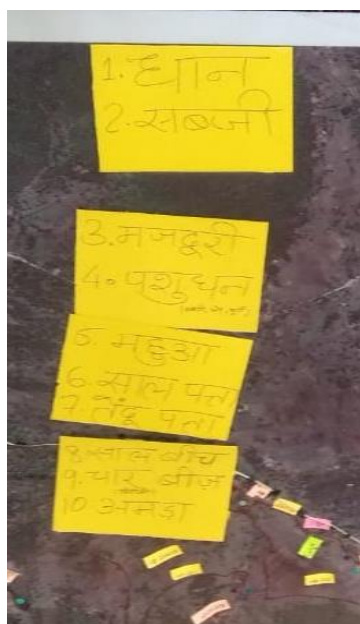
*The challenges identified are:*

1. The GP has larger surface flows of rainwater during the season but for lack of storage capacity runs into shortages during post kharif season.
2. Groundwater geology is not very conducive to recharging and accessing aquifers.
3. Large dependence on rice cultivation
4. Leaving out the uplands (Don 3 and *Tand*) resulted in very poor crops and dietary diversity from production.
5. Paddy (above the lowlands) is subjected to drought spells.
6. The community sees great scope in improvement in rabi crops with:
  - a. develop of irrigation
  - b. norm on controlled grazing during rabi season
  - c. if many farmers take to rabi crops
7. The stream flowing through the GP has multiple check dams in its course but some of them have breaches. Limited irrigation is extended.
8. Average productivity of rice seems to be low at around 14 qt per acre; while some farmers reported about 20 qt per acre in the low land paddy. SRI was introduced into the village and the villagers have a very good appreciation of SRI for improving yields; but it has now fallen apart as it needs much care.
9. Vegetables, oilseeds and many pulses are also not there significantly in the crop system and farmers depend on purchases.

## (2) UNDERSTANDING SOURCES OF INCOME

*(Mapping Household Income from different sources)*

Following the land types and crop types of exercise, a group exercise to understand the various income sources at HH level was carried out. The group listed out the following activities as the main sources of income:



### *Sale of paddy, vegetables*

■ **Wage work:** Almost every HH had 1-2 family members earning through wage work at brick kilns and construction sites in nearby towns. Many households have migrant workers going as far as Bangalore and Tamil Nadu in search of work. The income from wages appeared to be the chief contributor to income; the local wage rates are around Rs.120 per day.

■ **Sale of Livestock:** Collection and sale of NTFP ((*chironji, mahua, sa/leaf* etc.). Also, the contribution from NTFP produced seemed to have reduced in recent times. *Chironji* is one of the important NTFP giving them off season income.

### (3) UNDERTANDING STRUCTURE OF CONSUMPTION EXPENDITURE

*(Household basket of needs)*

Assuming that the participants in the exercise as the sample, an exercise was done on profiling the monthly consumption expenditure of a household to get a first approximation. After listing the items of consumption expenditure, the larger group was divided into sub-groups. Each participant listed out his/her HH expenditure on the categories listed by them. The individual cards are then listed, and the meaning was derived under each consumption group head.

The mean then was projected to annual consumption expenditure of 1000 households, broadly equivalent to a Gram Panchayat. The groups were asked to reflect on the numbers coming out of the exercise.

The striking result that captured the attention of the participants was the high expenditure on vegetables (Rs. 1.20 crore), edible oil (Rs. 55 lacs), pulses (Rs. 23 lacs), chicken, eggs & meat (Rs. 69 lacs) chemical fertilizers (32 lacs) and so on.

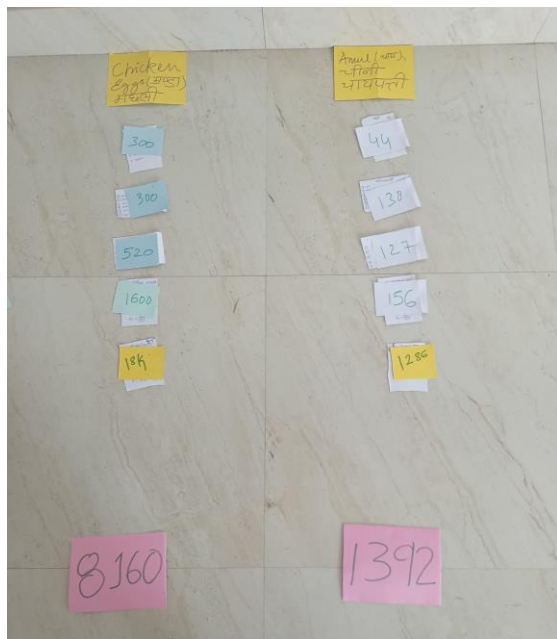
*Table below gives HH and GP level annual expenditure on various expense categories:*

AGRICULTURE					
Food & Non-Food Items	Seed Purchase	Fert., & manure	Machine	Labour	Crop Processing
Expenditure (in Rs.)	1310	3890	2619	7279	2445
GP (1000 HH) Yearly Expenditure (in lac Rs.)	13.10	38.90	26.19	72.79	24.45

RATION							
Food & Non-Food Items	Pulses	Oil (Mustard)	Tea Products	Papad/pickle	Veg	Meat eggs	Biscuit Chips
Expenditure (in Rs.)	2196	4848	1392	5784	14054	8160	3648
GP (1000 HH) Yearly Expenditure (in lac Rs.)	21.96	48.48	13.92	57.84	140.54	81.60	36.48

### Discussion on Expenditure Patterns

The participants are again made into sub-groups taking each of the major expenditure cards for detailed discussion and coming up with what needs to be done to 'internalise' the expenditure within the Gram Panchayat.



The exercise led to an engaging discussion in the group where they began to see the economic drain and discuss the possibility of reducing these by growing more vegetables, mustard etc., improving backyard poultry systems through vaccination, shifting to bio-inputs at least partially.

The logic of the local economy was explained by illustrating the drain.

<b>अचार &amp; आम पापड़</b> - आम - आमड़ा - दसली - नींबू	- जानकारी का अभाव - हाँ - समूह - Support from Govt.	- Training - Small Trade Enterprise
<b>तेल</b> - गहुआ 7.1 kg - 6.80 - कुसुम (केर) 1000g (100g) - 1000 - सरसो (3 kg) - 1500 - सिकांड (10 किलो - 60 kg)	- कम उत्पादन - जानकारी का अभाव - सबको का उत्पादन को बढ़ाओ है। (कम कमी में भी का सकते है) - रास करके (70 दिन) 2-3% (महीना) कात करने के बाद पुनर्प करने के बाद 2 बार सिपाई की जरूरत (2 सि सिपाई) (सिपाई से रास)	- 100 परिवार धन + सरसो - बिने 2 दिन बाद सिपाई सिपाई के बाद सिपाई 3 महीना का कात - रीम 3 (2000 कात) कात - बीजा का उपकरण - पानी का उपकरण (सिपाई उपकरण) - जानकारी, जाति
<b>दाल</b> - मूंड (मूंड)	- खेती नहीं करते हैं। - तांड पशुओं के मिस - पानी बावसा है तो पानी में उपड कर सकते हैं। - येन से खान के बाद मूंड का सकते हैं। खेती	

<b>सब्जी (14054र)</b>	<b>अडचने</b> - पानी की समस्या - आसस - समय का अभाव - Cमात्र (बाद, गिरी, बहुत मेहनत)	क्या कम्युनिटी इस चीज पर काम करेगा है कि/कैसे है/है। - महिला समूह (आसस पानी सुधार हो जरूर)	कायमी का - 10 डिपॉजिट - जगह का रचना - काम करना समय - 15 पानी की समस्या - सामग्री का-का-चाये
<b>मछली (खाने)</b> - बस एक बड़ा तालाब है जहाँ 2 महीना पानी रहता है। - बाकी जहाँ पानी है वहाँ मत्स्य पालन हो रहा है।	- तासाब है लेकिन पानी नहीं है। - बीमारी - जानकारी का अभाव - टीका करण समस्या	हाँ/ महिला समूह	- 10 डिपॉजिट कर सकते हैं।
<b>मुर्गी (खाने)</b>			- 10 डिपॉजिट कर सकते हैं।

The exercise led to an engaging discussion in the group where they began to see the economic drain and discuss the possibility of reducing these by growing more vegetables, mustard etc., improving backyard poultry systems through vaccination, shifting to bio-inputs at least partially.

Sl. No.	Cause of Concern - Heavy Expenditure	Drivers	Plan of action:
1.	<ul style="list-style-type: none"> <li>▪ <b>Vegetables (Rs.1.20 cr):</b> Around the year expenditure on buying vegetables was found to be a major cause of concern, draining out a huge amount of money from the panchayat at large.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The community stated that lack of available water, hard work, and a lack of time are the major reasons for not cultivating vegetables in the area. The women of self-help groups have shown interest in cultivating vegetables if water is available.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Each household dedicates 10 decimals (0.10 ac) for vegetable production with a minimum of 15 days of irrigation facility. The vegetables will be cultivated for hh consumption as well as for selling in the local market.</li> </ul>
2.	<ul style="list-style-type: none"> <li>▪ <b>Nonveg items (Egg, fish, chicken, pork, and mutton) (Rs.81.60)</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ The panchayat has many seasonal ponds, and only one is perennial; the reason for not producing fish. Desi poultry and goats are in good number but the frequent disease outbreak results in losses, increased dependence on boiler chicken from market for consumption.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Streamlining the vaccination service on a pre-paid basis.</li> <li>▪ Start Back yard Poultry integrated with the multi-layer farm.</li> </ul>
3.	<ul style="list-style-type: none"> <li>▪ <b>Papad, Pickle (Rs.51.40 lakhs):</b> Families do prepare pickles of Mango, Amra, Lemon, and Imli.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of knowledge and investment to start a pickle business was mentioned. Though the women of SHG have shown interest in engaging in the pickle business.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training on pickle making, providing.</li> <li>▪ Small tools, &amp; establishing a pickle enterprise can be planned.</li> </ul>
4.	<ul style="list-style-type: none"> <li>▪ <b>Oil (edible) (Rs.48.80 lakhs)</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Only mustard (which is also consumed) is cultivated in few patches where irrigation is available. Enhancing rabi cultivation; many farmers starting rabi cultivation will solve the problem of open grazing. Coupled with availability of few irrigations in Rabi – mustard cultivation can be enhanced.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Plan for the rabi crop intensification.</li> </ul>
5.	<ul style="list-style-type: none"> <li>▪ <b>Pulses (Rs.21.96)</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ No cultivation of pulses due to open and free grazing after the Kharif season.</li> <li>▪ Rabi cultivation is nearly absent because of poor irrigation development and open grazing.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pigeon peas can be integrated into medium and uplands. With a water facility, other pulses can be grown using residual moisture after Kharif harvest.</li> </ul>
6	<ul style="list-style-type: none"> <li>▪ <b>Fodder sales</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Rice straw is sold to outside from the village as the livestock economy is not well developed and as farm mechanisation is resulting into selling off of bullocks.</li> </ul>	

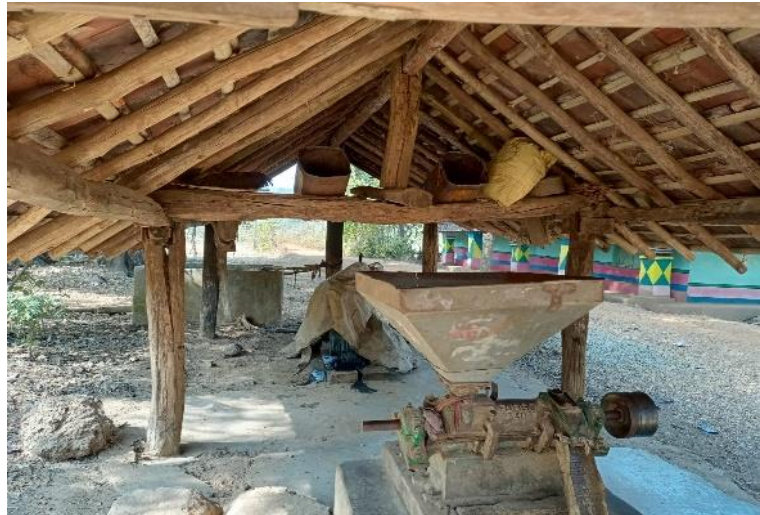
The participants stated that lack of access to irrigation during Rabi season, open grazing, high workload and lack of HH labor are the main reasons for not cultivating vegetables in the area. Women in the group who are part of self-help groups showed interest in cultivating vegetables if water is available. The group shared that there are a lot of ponds in their villages but most of them go dry during off-season, only one of them is perennial, this limits potential for fisheries development. Most HHs have desi poultry and goat but frequent disease outbreaks have resulted in reduction in their population and increased dependence on broiler chicken for home consumption. Crops such as mustard and pulses are cultivated in a limited way. Crop rotation and mixed cropping is not practiced. The practice of open and free grazing of livestock after Kharif season is also one of the reasons for the community opting out of *Rabi* crops.

A small exercise to understand the costs incurred to cultivate the main crop -paddy was also taken up to look at the economic costs and returns involved. All costs listed by the group- including land preparation, equipment added up to Rs. 18200/acre (engaging non-family labour). The average yield of paddy /acre was reported to be 14 q. Much of it was stocked at home for self-consumption, the produce was sold in parts when the need for cash arises. The prevailing market rate of rice was between Rs 1250-1500/qtl, thus amounting to sales of Rs. 17500- 21000 (if entire produce is sold).

#### (4) TRANSECT WALK

A transect walk through the Gram Panchayat (covered 3 out of the 14 habitations in the GP on bikes) gave us the opportunity to observe the landscape and community better. The exercise allowed us to observe the land classes, its uses, forests, commons, HH

*'badis'*, livestock management, water resources- wells, streams, ponds, level and nature of mechanization, spatial layout of houses, farms.



#### (5) REFLECTION BY COMMUNITY LEADERS (PRADHANS and Others)

Towards the end of the field exercises a meeting was organised with Village Pradhans (leaders of the tribal cultural institutions) and some elders to reflect on the outcomes of the exercises. The group endorsed the observations and the mean consumption expenditure on various items. The following points came up in the discussion:

- The trend in the landscape ecology is moving towards > mechanization and usage of fertilisers / pesticide use has



just started, though the quantities applied were low.

- A Pradhan was actively practicing System of Rice Intensification (SRI) and several farmers followed it with good impact. However, the practice stopped when the Pradhan moved away owing to his multiple other commitments. There is a general consensus on the potential negative impacts of chemical use in agriculture.
- There was a good appreciation of the usage of chemicals contaminating water resources.
- That the rainfall and water in general is high – but they were not able to store surface water in the monsoons for use later on. Resulting in acute water scarcity; so also, the ‘work force going out on migration’.

*The facilitators put forth two pathways for discussion:*

- Continuing the trend of more usage of machines, single crop, usage of chemicals and migration; purchasing vegetables etc., from markets through wage income.
  - Results in polluting the stream (that drains the entire valley), ground water, polluting the soils etc.,
  - Leaving a degraded environment to their children.
- A pathway of resource governance and investment on natural farming pathways, water resources development, intensification of agriculture, integration of livestock etc.,
  - Results in earning as much as they may get from migratory income
  - internalizing the consumption expenditure so that local production

taps consumption expenditure (for e.g., vegetables).

- healthy ecosystem with less risks

The group was briefly exposed to some potential solutions- regenerative agroecological models that can generate a decent income stream, such as *Back Yard Poultry with Multi-layer farming* and vaccination services, *vegetable production in Badi land, adoption of Natural Farming practices* such as dry sowing, use of bio-inputs, fixed (solar powered lift irrigation) /mobile (solar powered energy carts) and gravity-based *irrigation solutions* that enable access to water during Rabi season.

The ensuing discussion resulted in the following demands and commitments from the village elders:

- Willingness to learn Natural Farming methods; to learn various methods, preparation of inputs and crop system models.
- If an external farmer resource person is provided, the community would like to take care of their stay and food.
- To plan the water resources management – the community has agreed to identify 1 young person from each Tola (hamlet) for 10 days for comprehensive water resources planning.
- Pradhans will encourage households to set out at least 10 decimals (0.1 ac) of land for vegetable production.
- Streamlining the vaccination system that enables them to have desi poultry.
- Setting up enterprises on oil extraction and others.
- Extending all the support needed in taking this emerging requirement forward.

## (6) MEETING WITH COMMUNITY LEADERS (TRADITIONAL TRIBAL LEADERSHIP) AND PLAN OF ACTION FOR NEXT STEPS AND SEEKING THEIR COMMITMENT TO LEAD COMMUNITY ACTION

*The following Action points emerged from the 3 days exercise:*

- Comprehensive watershed development planning including development of irrigation accessed by every household at least for vegetable crops.
- Multi-layer Backyard Poultry / Desi-Poultry farming (Breed farms)

development – to start with one breed farm per each village (0.5 ac).

- Vegetable production for self-consumption and local sales.
- Streamlining vaccination services
- Establishing community managed Seed systems
- Promotion of natural farming.
- The facilitators invited the Pradhans and the Community Resource persons for an exposure visit to Andhra Pradesh.

WASSAN and Kalamandir team will plan the follow up actions. ■



'Regenerative, Climate Resilient and Productive Landscapes' program