

# Successful Revival of Traditions of Circular Economy within Farming System among Indigenous Rural Communities



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## Abstract

Presently world is facing issues pertaining to management of wastes in different sector either in urban or rural region. It became a problem not only for human but also other forms of life on the globe. The problem is a product of adopting the linear model of economic development, where results can be seen in the form of huge dumps of waste, degraded agriculture fields, polluted streams, encrusted lands etc. VAAGDHARA discussed the issues of sustainable production and consumption with its communities in hilly rural regions of South Rajasthan, India. Community indicated that the answer for this problem exists in traditional livelihoods and life style of the rural communities, where components livelihood pattern followed principles of circular economy. Series of consultations brought out that indigenous community in the vagad region were following a food system which was within the frame of circular economy, but the question was how to revive it or bring it back to the lifestyle of people.

Through various testing, trial and error we reached to a process of participatory learning and action tools centered on developing community understanding and practices. The paper share what are the components of economy in the rural area, what are the characters those make these traditional life-style circular, sustainable, and relevant within present context of climate change. Second aspect would be what are the tools and processes of Participatory Learning Action (PLA) we contextualized, applied and found successful for revival of food and livelihood system of indigenous community. Another aspect to paper will be how these findings can be used by other stakeholders and development agencies to identify cyclic characters of livelihoods systems of their communities and what interventions can revive them for betterment of the overall economy in ecological and global context.

Index Terms: Circular Economy, Farming System, Participatory Learning Action, Resource Efficiency, and Nutrition Sensitive Farming System

## Introduction

According to the UN Hunger Report 2014, 15.2% of Indian population is undernourished and as per Global Hunger Index (GHI) 2015 India ranks 80 in the list of 104 countries with a GHI of 29. NFHS-3 also proclaims "under-nutrition is leading problem issue in India" as 52% of married women are anemic and 58% children get stunted below 2 years of age. All these facts and figures are indicative of the vicious cycle of intergenerational under-nutrition in India. Rajasthan is one of major contributing state to poor nutrition and health status of India ranking 10th among 17 states (Hun Gama report 2011). The status of children under age of five years on underweight, wasting, stunting and MUAC in Banswara district, as shown in figure-1, confirms the poor nutritional status of tribal community in this region. The under-five mortality rate of 102 (per 1000 live birth) in the district as against 48 (per 1000 live birth) in India confirms the same. Even though Banswara is one among the focused districts in the state for various supplementary nutrition schemes. The poor status of nutrition is when it has various schemes of nutrition supplementation. To address the issue of under-nutrition holistically there is a need of an integrated approach considering linkages between agriculture, nutrition and health solution. VAAGDHARA conceptualized research study, focusing on revival of "Nutrition Sensitive Farming System" (NSFS) and aims at evolving intervention strategies and activities suitable for wider acceptance by communities, government and other development stakeholders. Need was also felt to design appropriate NSFS promotion methods and test them as Participatory Learning and Action. This aimed to evolve framework for community led farming system to tackle under-nutrition for the tribal dominated central India. This study was supported by IDS, Sussex, MSSRF through its program on leveraging agriculture for nutrition in south Asia.

When research study initiated and interactions with community started with its communities in hilly rural regions of South Rajasthan, India. When the issue of large wastelands (nearly 60-65% of total village land) was brought in discussion, it was realized that the problem is an issue of resource management and more and more families are now living their traditional livelihoods and migrates to urban regions for fulfilling their daily needs. Their answer, to question "why they have to live traditional livelihood of agriculture?" was that now agriculture has becoming very costly. And why is so, because now-a-days every input and every action in agriculture, be it seed, fertilizer, pesticide, inter-cultural operations, harvesting, threshing, has become cash activity and need money beforehand, so agriculture production is not sustainable. This is also confirmed by many agriculture scientists and economists that agriculture is now for poor farmer, which in turn a shock to VAAGDHARA and Indian economy, where 61% population is occupied and fed by agriculture. Later when further discussion reached to the ultimate question of "What our forefather used to do and why agriculture was sustainable for them?" Community indicated that traditional livelihoods and life style was sustainable because their agriculture was low input agriculture and they followed low input livelihood, their occupations were complementing each other. Consultations brought out that indigenous community in the vagad region were following a food and agriculture system which was more or less within the frame of circular economy, but the question was how to revive or bring it back to people.

Thus, for our research study a supplementary research question raised and that was "whether traditional farming system or livelihood pattern of indigenous families in Banswara region was following the principals of Circular Economy?" and clubbed this research question as part of our overall research study on "revival of nutrition sensitive farming system.

## Research Elaborations

### Study Area

The study was conducted in thirty villages inhabited by Bhil tribal community in Banswara district of Rajasthan, India. These were selected based on their geographic location, spread over in six blocks Anandpuri, Gangad talai, Sajjangarh, Kushalgarh, and Ghatol of district Banswara, Rajasthan, India.

### Study team

The research team included nutritionists, a qualitative researcher, and a biochemist. They were assisted by a field NGO active in these tribal districts. Multilingual speakers from the NGO well-versed in tribal dialects and also able to interact with the research team in English and Hindi were involved in the data collection.

### Methodology

The study aimed to conduct a formative research to identify food diversity in the area and their potential for adopting as part of farming system. It will also investigate the feasibility and effectiveness of adopting participatory learning and action tool for promoting Nutrition Sensitive Agriculture for Banswara district of Rajasthan and develop a framework for wider replication to scale-up it in similar regions. To strengthen policy environment VAAGDHARA team interacted with policy makers also.

### Research Questions

- What are the traditionally found diverse items that were used as source of food and nutrition by tribal community of south Rajasthan, can they be promoted again to address problem of under nutrition?
- Whether traditional farming system or livelihood pattern of indigenous families in Banswara region was following the principals of Circular Economy?
- What are the key barriers and enabler across agriculture, nutrition and health that influence circular nature of farming system and nutrition outcomes? And how we can use them for promoting NSFS following principal of circular economy to fulfill nutrition and other demands of communities?
- How can PLA approach be extended to promote concept circular economy within nutrition sensitive farming system for addressing problem of under nutrition?

### Objectives

- Identify characteristics of farming system and gaps, with respect to traditional practices of indigenous community of Banswara.
- To identify locally available traditional foods as resilience against food insecurity.  
To bring out the nutritive value of traditional foods and capture their health benefits.
- To capture stories associated with traditional food items agriculture practices and involve them in PLA processes and test their effectiveness in promoting NSFS.
- To test applicability of PLA in adoption of circular economy for NSFS by small and marginal farmers to address family level food insecurity.
- To design and test framework that can be delivered for promoting circular economy and NSFS at scale for wider replication with efficacy and effectiveness

## Formative Research Phase

This was carried out through a Kisan Swaraj Yatra (Farm Sovereignty March). Under this phase of study following types of respondents were involved in study.



Discussion and awareness with senior school children



Focus Group Discussion with Women farmers, young mothers, mothers groups associated with Anganwadi



Focus Group Discussions with elderly farmers at 20 villages



Discussion with Adolescent girls of seven KGBV (Kasturba Gandhi Balika Vidhyalaya)



Farmer to Farmer contact at Mundri by Ranglal ji of Ratapan



Interview with Key Informants with local leaders, lead farmers, elderly people, school teachers, health workers, village service providers etc.

## Feasibility Study Phase

All this information generated during the formative research phase was consolidated and utilized to potential module of participatory learning and action and tested for feasibility as tools for building on methodology for propagating circular economy within NSFS as sustainable solution for nutrition and food security. The PLA module (Appendix-II) was tested in 30 villages with 30 groups of 20 participants each making a total of 600 respondents.

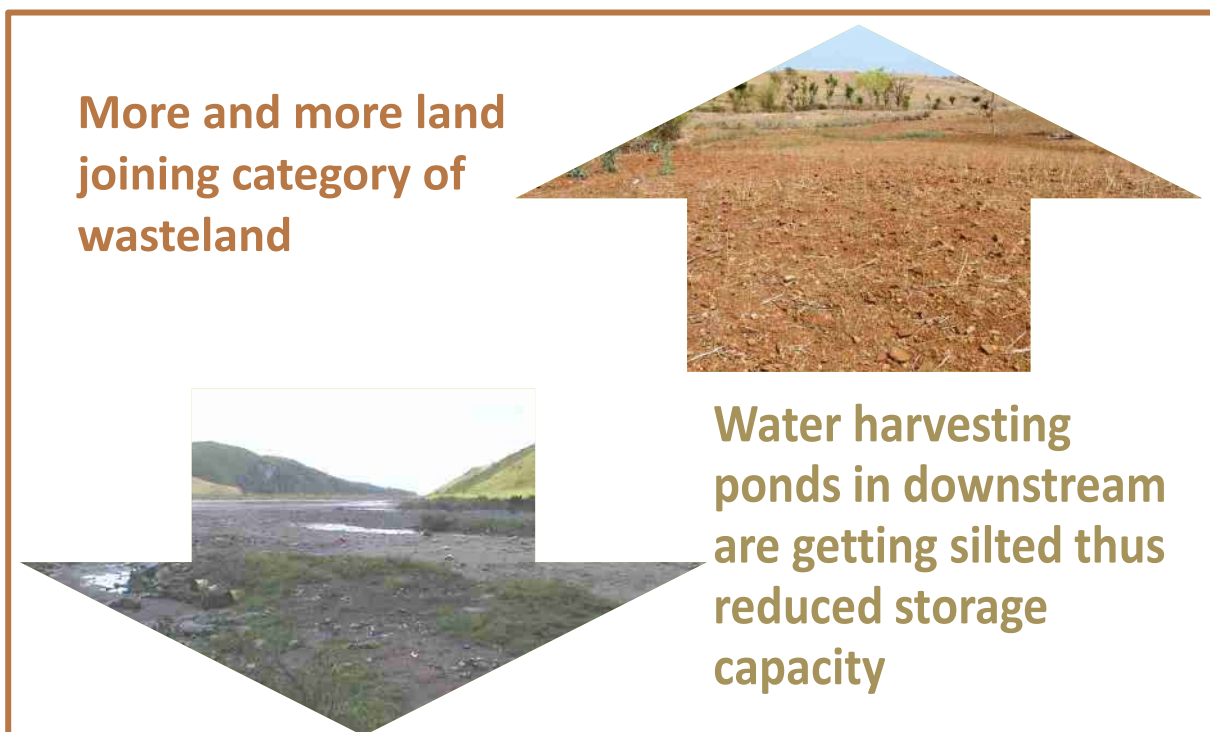
The data thus generated with these 30 groups has helped to refine PLA module which can be applied by wider community to assess characteristic of farming system of community on the principals of nutrition sensitiveness, sustainability of consumption and production and nature of economy. The whole process of assessment is designed to promote nutrition sensitive farming system; sustainable consumption and production following the principals of circular economy.

## Results or Finding

During the study application of participatory learning and action tried to look for research question "Whether traditional farming system or livelihood pattern of indigenous families in Banswara region was following the principals of Circular Economy?"

### Characteristics of Present Farming System

- In the project area, most of the land (80-85%) is sloping, of which 60-65% is used for cultivation without following sustainability principles. Consequently, one of the major outputs of this farming system is that of Wasteland. Every year more and more soil is getting eroded causing wastage at two level

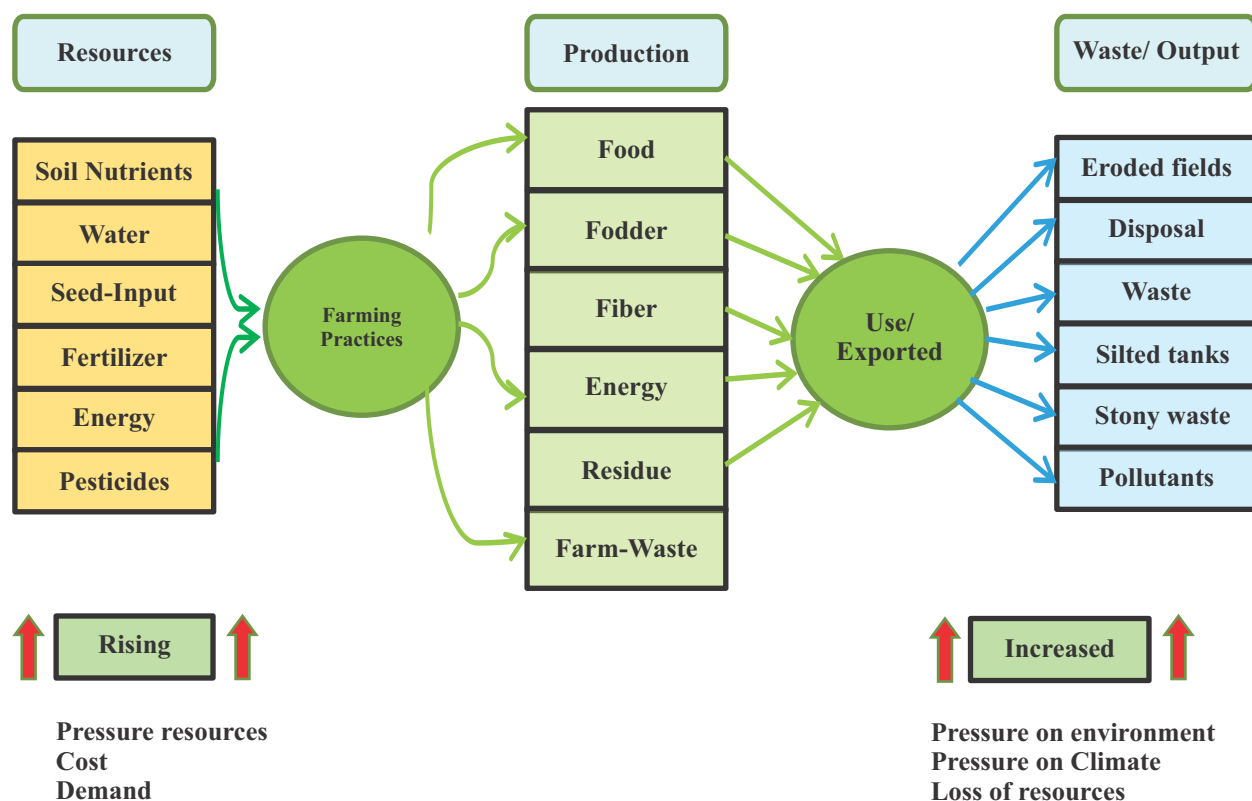


- Animal excreta which is important input for agriculture component of farming system is not stored, processed properly thus making it almost in-effective such that it reaches to almost the stage of "waste", thus affecting crop production or causing extra cost to pocket in term of chemical fertilizer (Urea, DAP) but still lacking other micro-nutrients, making soil again a wasteland either in terms of higher concentration of some salts and lacking in others.
- Farmers in the area mostly illiterate, thus lacking awareness and knowledge about application of pest control measures, particularly for crops which were not so common in this area earlier. Thus, for pest control, they have to depend on suppliers, who in their interest of more business sale higher quantity in over-dose causes double wastage one in terms of money and other in terms of persistent pollutants affective overall ecology and also health aspects.
- Market orientation and lack of proper knowledge has caused reduction in production diversity to very limited number of crops (table-2), thus increasing the risk of crop-failure and risk of economic losses due to price collapse.

**Table 1: Commonly grown crops in the area**

Cereals	Pulses	Oil seed	vegetables	Cash Crop	Fruits
Wheat, Maize, Rice,	Pigeon-pea, Chickpea Green & blackgram	Soybean, Mustard, Sesame	Okra, egg-plant, cluster-beans, Tomatoes	Cotton, Chili	Mango

- As most of the small and marginal farmers in the district do not have access to credit/cash for investment in agriculture input, they must depend on local money lenders. Thus, either they do not follow proper package of practices or they simply do not go for input, and accept whatever is produced. Therefore, their most practices go hand to hand with what is described



**Figure 1 Linear Economic model, adopted from Dr. Ben-Allen**

## Characteristics of Traditional Farming System

During this study farmers in almost all groups reflected that many of them follow two models of farming, one is for market purpose, for which they will follow nearly monoculture, application of chemical fertilizer, pesticides, certified seeds even over doses etc., which is more or less linear model, but for family consumption their perception see a paradigm shift household purpose they starts thinking differently, they follow nutrient cycle so as to produce it organically and contamination free food. This gives an indication that promotion of nutrition sensitive farming system is important for revival of circular economy based sustainable consumption and production

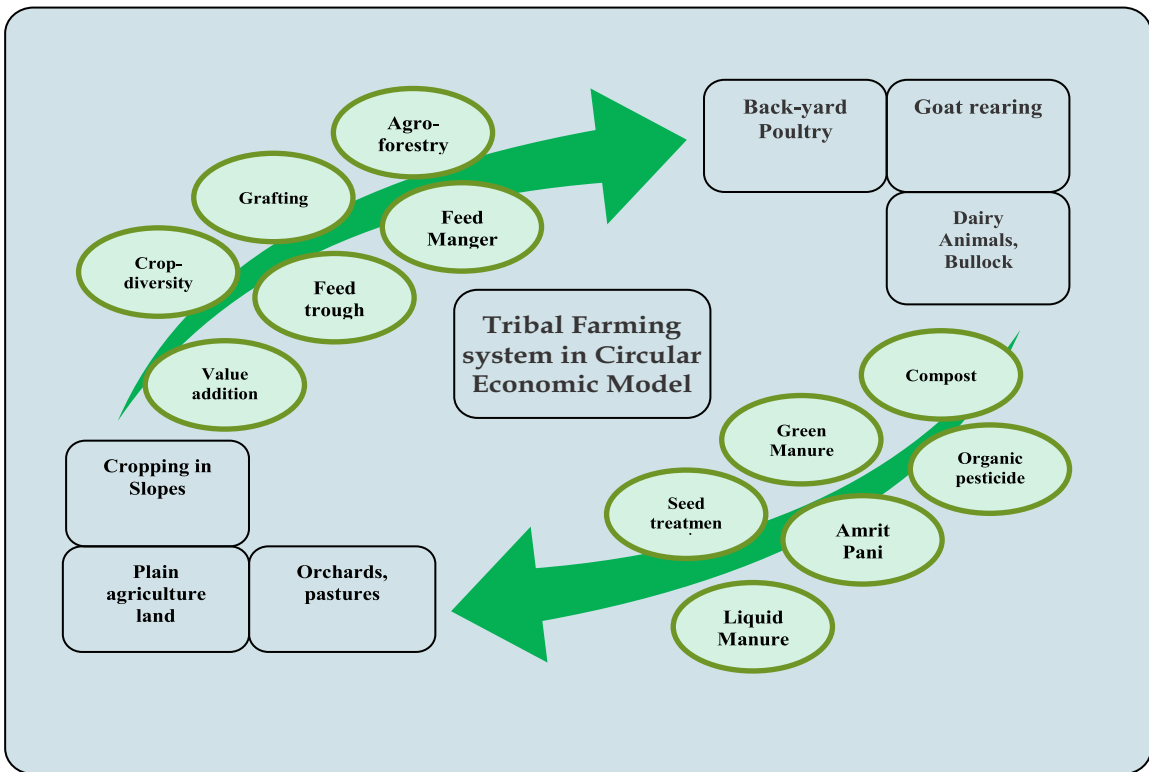


Figure 2 Symbolic Notion of intervention incorporated to make economy Circular

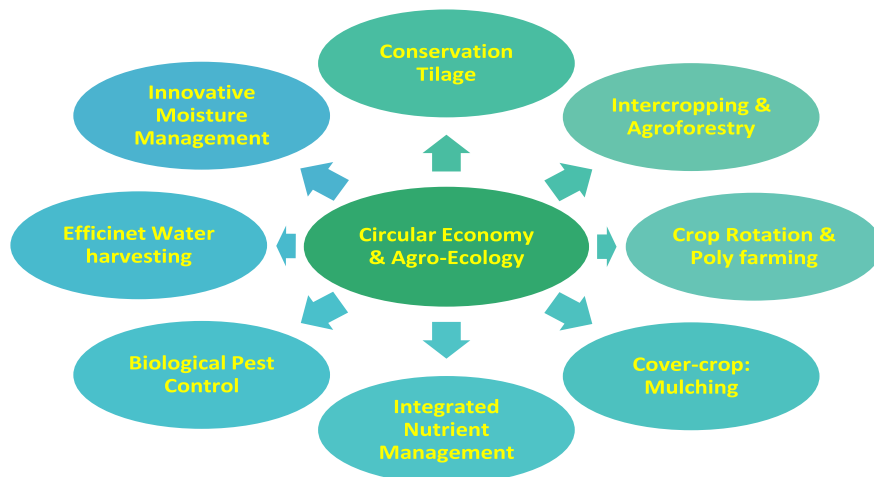


Figure 3 Ecological Practices Revived through the study Project

## Discussions

### Circular Economy and Nutrition Sensitive Farming System

The circular economy is an economy designed to operate within a cyclic flow that provides to minimize losses (qualitative and quantitative). It is a kind of economy that aims to be based on renewable energy sources, to minimize, to trace and eliminate the use of toxic substances and to eliminate the production of waste or waste by careful design. (Iraldo F., Bruschi I., 2014) The circular economy is, therefore, a viable alternative to a traditional linear economy, based on hyperproduction and based on the wastes: that is currently produced with frenzied pace.

The aim of circular economy is to minimize/ eliminate the waste, utilizes renewable sources of energy and phase out the use of harmful substances (Ellen MacArthur Foundation, 2012). Fostering the uptake of the circular economy concept in agriculture requires analysis of the existing system, potential opportunities and benefits that a circular economy approach could yield first for farming families, environment and overall economy. The new economy has instead as main objective to make the most of the resources, and then be recycled and reused. In this vision the refusal becomes resource, which must be valued and that has to feed the system of production and consumption, going to reduce the demand for more raw materials. Importantly, this model has its roots in the past: think of the good traditional farming practices, characterized by a recirculation of the resources that were reused. Development of circular economy to the Europe 2020 strategy aims to pursue the green economy. (Consiglio Nazionale della Green Economy, 2015). Practices Adopted by Farmers to transform farming in to Nutrition Sensitive Farming System with principles of Circular Economy and resulting in sustainable consumption and production.

At rural level the circular economy is what, that aims for the elimination of waste through the design of farm plan and farming system. Its essence is to farm plan no waste products that facilitate disassembly reduce, reuse and recycle, which is the main slogan of environmentalism or nature. VAAGDHARA helped the participating farmers to assess their livelihood production through the glasses of circular economy. In ecological arena, nature follows its own cycle of nutrient and energy flow, through different forms (biotic and abiotic), process (integration and disintegration), systems and strategies

#### Was it Circular Economy?

Since my childhood, we wasted no resources and reused everything, what you call as circular economy principles without even knowing it. Now with changing generation now our children do not believe in re-use or no wastage. This process has shown many of our youth to think on traditional line and rejuvenate our cycle of production with challenges.

**Mr. Ranglal, Village Ratapan**

### **Principle 1: Preserve and enhance natural capital: by controlling finite stocks and balancing renewable resource flows.**

In a rural farming system, particularly in hilly areas most common challenge is that of natural capital of soil, moisture, seed, and energy. Thus, farms which follow linear model face crunch of all these capitals in the form of soil-erosion, fertility loss, lack of moisture, high cost for seed and use of fossil fuel for power resulting in waste. Farmers when applied these glasses could realize the benefits approach of circular economy towards enhancing natural capital by encouraging flows of nutrients within the system and creating the conditions for regeneration, for example, soil building, optimizing water use and renewable energy.

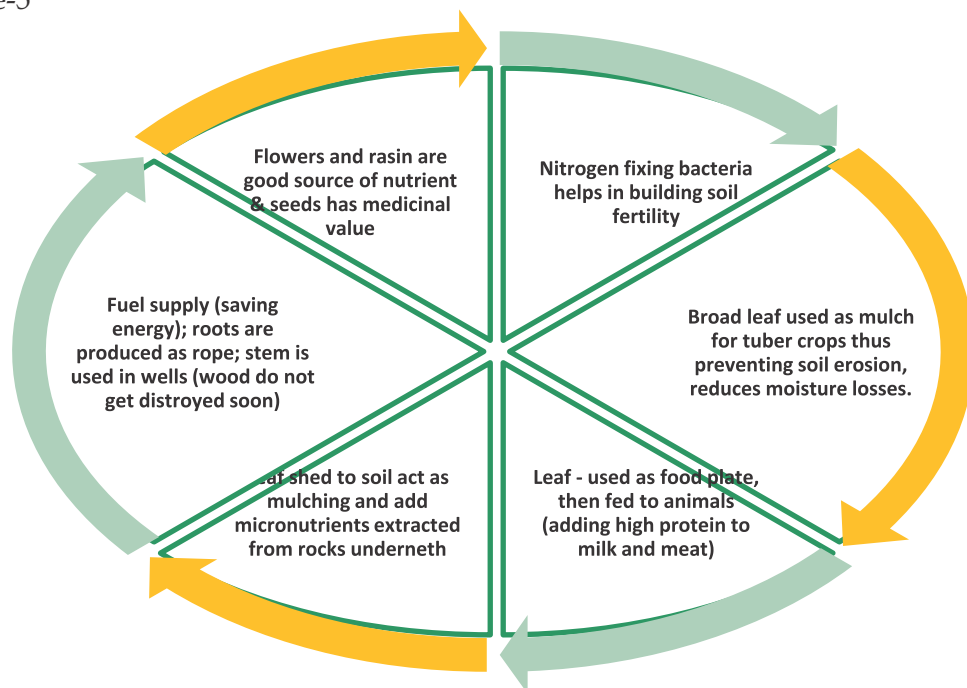
**Principle 2: Optimize resource yields: by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles.**

This means designing a farm for recycling within tighter, inner loops to preserve more energy and provide additional value, by enhancing loop and optimizing multiple use, sharing implements.

**Principle 3: Fostering system effectiveness: by revealing and designing out negative externalities.**

This includes reducing damage in terms of use, such as food wastage, agro-forestry, use of bio-degradable material, learning from system, and managing externalities, such as proper land use, cover plantation, water management, avoiding pollutants. By applying these key principles discussion indicated that traditionally farming practices of indigenous tribal community of Banswara region followed circular economy. The tools applied to assess farming system (economic model) followed by a family or community, also acts as motivation tool, which is can be inferred from the data about the practices revived or adopted by the participants of the study groups. The processes in the revival and study of traditional system of natural forming focusing on nutrition sensitive farming system applied the principles of a circular economy to all its components following the concept of multiple value creation mechanism, addressing key resource and system challenges that present day rural economy faces. Study has reflected that present farming system of tribal community follows model is a combination of linear and circular, for most of the families it is neither linear nor fully circular, but even then, the traditional farming system was following various component of cyclic approach, which can be included to make it more strong loop. Some aspects that are included effectively to fulfill all the three principles of circular economy are listed here.

- Inclusion of deep rooted, leguminous plants with food, fodder, fuel and timber values as agro-forestry within farming system such as Palash (Butea monosperma), Drumstick (Moringa oleflora), etc. strengthens the whole farming system in different nodes of loop as reflected in figure-5



**Figure 4 Improvement to Circular Economy through adding Palash in Farming System**

- Increased bio-diversity at farm level, following the principle of root depth and canopy layer crops combinations helps in optimizing the efficiency of production system utilized soil nutrients and water moisture from different depth zones.
- In hilly one of the key challenges faced by S&M farmers is that of erosion of soil through various natural and human interventions, which in turn cause reduction in production and slowly-slowly resulting in well-known product of linear economy i.e. waste (land). Discussion on this issue went to the level that community started applying measures of erosion control in the form field bunds, land leveling, step farming, sloping agriculture land technology etc.
- Community also revived back a culture of worshipping soil (figure-)
- During the revival project the loop of fodder from field to feeding animal was also found weak, thus two components namely chaff-cutter and feed-manger were added to reduce waste of fodder by 45%.
- Wastage of urine; was another critical arena within the farming system, which was not bother in recently followed system and it was gathering in small ponds making them also as waste water pools. Thus, it was also discussed within gap within the system and component of preparing liquid-manure and amrit-pani (local name for a preparation of manure using animal urine and dung)

## Limitations

This research applied tool of assess farm-diversity and identification of waste generating nodes within the farm nutrient cycle. It is found useful in gaining quick understanding of the characteristic of farming system; linear, circular, or hybrid through farmer's group exercise with 30 groups, but it is not widely validated in separate survey. Thus, data with regards to farm diversity cannot be quoted for policy purpose, but they have been useful to motivate individual households and group to fulfill gaps within their food system. However, VAAGDHARA found that it has given us efficiency lens to access farming system with reference to its performance against sustainable consumption and production for promoting nutrition sensitive farming system for successful achievement of no poverty and zero hunger

## Conclusion

The action research project suggests that besides socio-economic factors, food insecurity is also caused by ignorance of traditional farming system, which was quite in tune with principles of circular economy. The motivating factor for revival of sustainable consumption and production with small and marginal farmers lies in low external input and therefore it was comparatively more acceptable to indigenous community, may not be that attractive to larger farmers.

PLA-NSFS is a basic framework which functions on the principals of recycling of nutrient and energy. It can be utilized by stakeholders working with communities elsewhere also, with little modifications to fit with local agro-climatic, cultural, political and socio-economic conditions. These findings may be beneficial in guiding intervention of non-governmental and other organizations for effective assistance to most vulnerable populations in adopting circular economy for improving nutrition and health outcomes. Participatory Learning and Action-PLA tools focusing on nutritional outcomes can help in bringing paradigm shift in agriculture dilemma farmers are facing today

## Appendix

### Appendix I Checklist of Information gathered during formative-phase focus group discussions, interviews and survey.

This phase helped gain insight into the barriers and opportunities and to define appropriate strategies with respect to their agriculture, food, nutrition and developing effective intervention. It would involve aspects of;

- Identifying locally available foods (cultivated and un-cultivated) which were used traditionally as resilience against food insecurity by community in the region.
- Capture sayings, stories, folklores, cultures and practices associated with foods.
- Nutritional analysis of major food items in traditional diet and capture community observations pertaining to health benefits linked to them.
- Historical journey of changes that have occurred within farming systems and diet intake in the area with time-line and their consequences.
- Test applicability of PLA tools in removing constraints in adoption of NSFS by small and marginal farmers to address family level food insecurity.

Above aspects would be captured through following tools.

### Appendix II Comparative table showing difference between traditional farming system and present farming system

Farming inputs/ Practices/ operations	Characteristics of Present Farming System	Characteristics of Traditional Farming System
Field Preparation	Cash/Money (Tractors)	Using bullocks and plough
Seed	Either purchased from relatives/trader on high cost or government provide on subsidy (Money)	Seed, was selected, treated and kept aside by farmer family, at almost negligible cost.
Knowledge about Seed characteristics	Negligible, as most of the time seed packets are shared by many farmers, more over most of the information are in-completed	Farmer used to be well aware about the seed and its variety as selection was based on the variety and it was knowledge of generations.
Fertilizer	Purchased from market or not applied (mostly quantity of fertilizer dose depends on cash available, or fertilizer availability	Farm-yard manure treated, agro-forestry, mixed farming, inter-cropping, green-manure, application of human excreta and urine etc.
Pest Control	Pesticides (Money)	Not many methods, but physical methods like smoke, making sound, using light, barriers etc.
Inter-cultural operations	Either not done, if done weedicides applied, or mechanically done, through labor (all demands money)	Weeding by hand picking/agriculture implements by family members
Harvesting	Machines (Money) (Half fodder is left in field)	Manually (Full recovery)
Threshing	Machines (Money)	Manual by using cattle

## Appendix Tools that were applied within Participatory Learning and Action-Module

### What we eat vis-à-vis what we produce

Once group of farmers were formed, the first tool was to understand food and farming of the family. As the name states it started with listing of food items consumed today by group members and how many members consumed, what many items. Facilitator tries to be as detailed as possible, even mentioning salt. Once information for today is captured, the exercise moves to yesterday and then to day before yesterday. Altogether three days data is captured. A consolidated list is developed on what group has consumed within last three days. Then comes the second component i.e. within group how many members have utilized by own production, collected from forest or other common places, brought from relatives or bought from market. The exercise almost takes three to four hours. Thus, group is then given a task to go back home within ten days to find out what they have cultivated during this year and last years, come to next meeting prepared with some samples if they or list of that crop/ produce.

### Linking between - Agriculture System and Food System

In second meeting after a week, members come with some samples and some names in mind. With formal greetings facilitator creates a space with three columns on ground to draw a matrix. In first column, each one come keep food items/ grains samples they have brought in different categories as mentioned by facilitator as grain, pulses, vegetables, fruits, spices, leafy vegetables, milk and milk products, animal protein etc. Once items are set in first column, each member is given different colored identifiable seeds such as Mango, Khajur, Jamun, and Mahua etc. Each family is given around 100 seeds of one type so that they are visible to everybody in the group and able to identify each-other with that seed. Now each participant stands-up one-by-one and keeps one seed in each cell for this year and last year for what they have cultivated, grown or produced. After spending around half-an hour, a matrix is evolved which gives comprehensive picture of farming followed by group members, later group discuss on:

- a) What are common crops/ produces cultivated within group?
- b) What are less common crops/ produces in the group?
- c) What are crops very specific and grown by one or two members only?
- d) Is there any specific reason/interest/resource which makes them grow/produce this crop/item?
- e) Which items are produced but not consumed locally?

The discussion triggers the thinking process with the group on linkage between food system and farming system and how closely looped they are. By this time, they have already spent three to four hours, it is time to decide what to do next week before 3rd meeting.

Group disbursed with a mandate to come with information on which items is produced through which resource base and what are the source for them to get that resource.

## Linking family resource base with farming (livelihood) system

The session starts with review of learning and action taken so far. Facilitators seeks groups input for what types of resources are identified and develop one card for each one of them; nutrients, soil, water, energy, seed, animal, trees, labor, know-how etc. Then resources are brought down to the level of sources i.e. agriculture field, sloping land, pond, rain, canal, river, stream, well, forest, pasture, commons, goat, sheep, dairy animals, poultry birds etc. Group starts matching the produce of last meeting with different sources with members of group. They also try to quantify and qualitative production from different sources as mentioned above. Task assignment for the group for the week is make list of input, operations, output, wastage associated with each source category for the coming session.

## Characterizing Farming/ Production System

Before, coming for meeting facilitator, make a visit to some of the active members of the group and assess what they have tried to understand from the exercise so far. Farmer's group tries to take one source at a time keep source card in center, input cards (yellow card) are generated one-by-one and kept on left hand side, (taking benefit of figure-1) output/produce generated on right side (green card); further to the extreme end any wastage or negative impact it cause on family economy/ecology is kept. This exercise is repeated for each source category found within the group (different types of lands and water etc.). Here comes the crunch of the exercise i.e. to help group discuss on items such as:

- a) Types losses that are occurring with their sources and resources?
- b) Are these losses being of permanent nature or can be replenished?
- c) When these losses started flourishing in it, what was done traditionally to fight such losses?
- d) What were the methodologies their parents or other might have carried out earlier?
- e) Is there somebody in the group, village or nearby who is not facing such losses, if yes why?

Group disburse with the task to visit and meet places/families who have overcome problem of wastage from their farming system, and see how they have done it, discuss how they can also take such beneficial steps. Farmers are given a Kisan Diary to fulfill general information about their family source, so that next session they can quantify their sources for planning.

## Designing for Farming Practices with approach of Circular Economy

The session is critical and important, because now it is time for guiding group to plan with the approach of circular economy for developing their sources for sustainability within supply of resource for maintaining production and ecological benefits. Session starts with showing some of the best clippings for motivation of the group, it is difficult to find some good video in local dialect, but it could use clipping in Hindi as most of our group members were young.

After showing video discussion starts about the findings of members visits and discussion with reference video clippings shown vis-à-vis concept of circular economy within their farming system. Group discusses on the activities shown in various clippings and was there any similar approach did they recognized or come across in their visits. Were there some traditional practices that were followed and not used now, that could help out farming system to more resource efficient and we move towards sustainable production.

Group members now open diary to observe their own source profile and work in a group of four/five to check if they can plan their farming practices for efficient resource utilization. Facilitator reminded group members about making use of the list of items that we eat but not produce and list of items we produce but do not eat, to make farming system nutrition sensitive. Group disbursed to work in small groups for how to make farming system resource efficient and think about the plan for crop-planning for the coming year.

## Crop Planning for NSFS in coming year

The session was carried after fifteen days of earlier session, as facilitator must visit smaller groups and facilitate thinking process once again for their family level planning exercise, considering the resource investment and human power available with family and group. Considering first three exercise and objective of making farming system sustainable, group plans for what all diverse crops that were produced by their earlier generations and not cultivated now, do they have any reasons for cultivating them that time, why they have disappeared, should we bring back them; can we do that?

Help them plan for nutrition sensitive farming in coming seasons, facilitate how they can do it, where they get knowledge, input, guidance, seed; how group will proceed and collectively monitor the progress. Group also planned arrangement for seed material. VAAGDHARA helped through research project to provide support for input in the form of seed material as local exchange and nearby area. Responsibilities are set for collection and procurement of seed material and distribution from one group to another group. VAAGDHARA collected information about the technical aspects and developed some calendar, posters, pamphlets, etc. and shared them with the group members. It was followed by sub-meeting (after a week) for distribution and exchange of seed and seeding material demonstration of organic practices for input management. As crop season is to start and group members were not available for discussion next session was planned after a gap of one month, but if required group can meet with each other for any clarification if required.

## Review of cropping against Plan

This was more a field exercise, but even than members gathered at common place, used cards and family seeds for assessing, who sowed what items against the plan. A list was generated against which each member kept their representative seed indicating how many members sowed what crop (traditional & first time after PLA). Once this part is over, group makes a visit to each farmer field area and makes observations pertaining to specific crops and plants. After coming review each crop against germination, growth, diseases etc.

## Identifying uncultivated traditional food items and recipes

This was one of the very important, interesting and learning exercises which were carried out in each group, post onset-of monsoon. In this exercise, initial discussion focused on plant growth, actions against the planned interventions focusing on resource efficiency. During discussion facilitator raise the issue of weeds in different crops and how we can use them group members reflected about the human consumption/cattle feeding potential of one such weed. Then group made a visit to various parts of villages and identify non-cultivated food plants in the villages, brought some leaf, flower, other parts. After coming back group tries to name them, what are their uses, how they are consumed, what are the health benefits, if some story or cultural saying associated with it and how to cook them, what are the restrictions associated. Following photos shares pictorial story of one such exercise.



## Acknowledgment

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## References

- [1] A Facilitator's Manual on SIFS; Welthungerhilfe for South Asia Regional Officer Publication.
- [2] Agri-ecology: What it is and What it has to offer: Issue Paper June 2014: IIED, UK
- [3] Census of India 2011, Rural and Urban Distribution of population. New Delhi: Government of India, 2011.
- [4] Coen Reijniers, Britus Harverroth and Ann Waters-Bayers: Basic ecological principles of LEISA : Farming for Futures: Page number 65-110
- [5] Dr. Ben Allen: IEEP: Role of Agroculture and Forestry in Circular Economy-2015: Workshop proceedings; [www.ieep.eu](http://www.ieep.eu); EIP\_Agri workshop : [www.eig-gri.eu](http://www.eig-gri.eu) Ellen MacArthur Foundation (2012), "Towards the Circular Economy. Economic and business rationale for an accelerated transition", Cowes: Ellen MacArthur Foundation
- [6] E.U. Commission, (2015), Closing the loop. An EU action plan for the Circular Economy, COM(2015) 614, Bruxelles
- [7] Facilitation Guidelines\_PLA\_LANN Manual; Welthungerhilfe
- [8] Janine Benyus, author of Biomimicry: Innovation Inspired by Nature,
- [9] Marije Vos; The circular Economy what is it and what does it mean for you [https://www.arcadis.com/media/9/D/3/%7B9D33B0CB-3F9D-4C16-9C74-B763D4BA442C%7D%20Briefing%20Paper%20-The%20Circular%20Economy\\_002.pdf](https://www.arcadis.com/media/9/D/3/%7B9D33B0CB-3F9D-4C16-9C74-B763D4BA442C%7D%20Briefing%20Paper%20-The%20Circular%20Economy_002.pdf)
- [10] M. P. Mathai, What swaraj means to Gandhi,
- [11] Murray A, Skene K, Haynes K. The circular economy: An interdisciplinary exploration of the concept and application in a global context. Journal of Science and Technology, Vol 9(46), DOI: 10.17485/ijst/2016/v9i46/107325, December 2016
- [12] Reshaping Agriculture for Nutrition and Health, IFPRI Publication
- [13] Sachs J., (2015), The Age of Sustainable Development, Columbia University Press, ISBN-13: 978-0231173155, Page 543, New York, USA
- [14] Shenggen Fan, Rajul Pandya-Lorch, and Heidi Fritzsche: Leveraging Agriculture for Improving Nutrition and Health: The Way Forward (Chapter-23) Reshaping Agriculture for Nutrition and Health: International Food Policy Research Institute Washington, DC year
- [15] Singh G. Green Consumerism in India: The Challenges Ahead.
- [16] Xian-jin ZB. Research on circular economy development indicator system and demonstrable assessment. China Population, Resources and Environment. 2005; 3:006.

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