



With support from



A FACILITATOR'S MANUAL

# SUSTAINABLE INTEGRATED FARMING SYSTEMS

# IMPRINT

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# FOREWORD

Dear Reader, Policy Maker, Manager, Facilitator or Farmer,

Are you looking for a guideline that can lead your way for facilitating a change process for small farmers? Are you interested in increasing farm diversity and productivity? Do you want to contribute to a better environment and sustainable farming practices? Do you want to improve nutrition and income of a farmer's family?

Then you have found a good manual.

This manual is an outcome of the “Sustainable Integrated Farming System Program” which is implemented in three countries (Bangladesh, India and Nepal) since 2011 by six national NGOs in cooperation with Welthungerhilfe.

From the start of the program, we have put emphasis on improving the facilitation skills of field workers as well as standardising processes. According to us, efforts that worked on systems and methodologies to improve the capacities of farmers have been widely neglected by governments and international development actors. More than ever, the government's focus is on quick fixes, such as distributing new varieties, fertilizer subsidies and minimum support prices. Improving extension systems and skill building of farmers that would yield social, economic and environmental benefits at the same time, is seen as too difficult for governments to intervene. Most programs remain half-hearted and the interest in sincere capacity building efforts has reduced considerably. This is a tragedy, especially for small holders in disadvantaged and remote parts of South Asia!

This manual is a contribution to bring back a genuine interest in skill building for small-holders by facilitating an intensive and systematic process to bring more diversity to the farms, as well as integrate and improve production processes. We believe that farming, including smallholder farming, is not only a traditional lifestyle or livelihood, but also a profession and a business, which can be viable. To maximise the benefits from small-farming, civil society, the private sector and Governments need to step up efforts to provide effective extension and skill building. In this sense, this manual can provide a model for larger interventions.

This manual is still work in progress. It has been field-tested for its efficiency related to the sessions and the learning outcomes; the processes have proven to be effective as well – as indicated in a number of case studies and data analysis of our program. However, we feel that some of the processes may still require fine-tuning and we would need your feedback about your experiences in using the manual.

Please provide your feedback, suggestions and comments.

**Joachim Schwarz**

Regional Director, Welthungerhilfe South Asia

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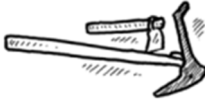




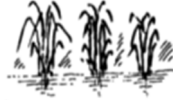




















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## LIST OF ABBREVIATIONS

CBO	Community-Based Organisation
CWS	Centre for World Solidarity (Partner NGO)
DRCSC	Development Research Communication and Services Centre (Partner NGO)
FFS	Farmer Field School
LANN	Linking Agriculture and Nutrition
LEISA	Low External Input Sustainable Agriculture
PLA	Participatory Learning Approach
SIFS	Sustainable Integrated Farming System
SPWD	Society for Promotion of Wasteland Development (Partner NGO)

# LIST OF SYMBOLS

Symbol	Meaning	Symbol	Meaning
	Agricultural Machineries		Irrigation
	Autumn		Kitchen garden
	Bucket of water		Lowland
	Cash		Market
	Collected Food Item		Pond/Aquaculture
	Cow		Poultry
	Cow with cub		Rainfall
	Disaster		Rainy season
	Drinking water		Resource farmer
	Dry Fodder		Sheep
	Fall		Spring
	Family / labour		Summer



Firewood

Fodder

Food

Food processing

Goat

Green fodder

Farmer groups



Temperature



Tree which can be cut from 3 feet



Tree which can be cut from 5 feet



Upland



Waste products



Winter



# 1 Introduction

## 1.1 Background: Why SIFS

### Case Studies: Common Problems Faced Prior to SIFS

Kedar Singh lives in the dry area of Jharkhand, India, and is the only breadwinner in his family of 4. Kedar owns 3 acres of land, including 1.5 acre of upland, 0.5 acre of medium land and 1 acre of low land. He also has 1 cow, 2 bull, 5 goats and 9 ducks. He had been practicing rain-fed traditional monocropping for a long time without farm planning. Kharif paddy, which was a major source of income, was unsuccessful because of frequent delays, unreliable monsoon, falling productivity of land and increasing cost of cultivation. So along with having to buy vegetables, he was also buying cereals to feed the family – and built up a large loan.

Kuber Praja lives in the sloped terrain of Chitwan, Nepal, and his household of 8 includes his wife and 6 children. He has about 0.5 acre of land, out of which only 8 Kattha are registered farm land in the slopy terrain and are a source of family income. He adopted monocropping practices, concentrating on cereals, on his entire farmland. He also has a few chickens and a goat. The harvest and income were not enough to feed his family.

Sukomol and Alpana Mondal live with their 2 sons on a farm of 1.7 acres in Sunderban, on the coastal belt of West Bengal, India. Their youngest son (4) is physically challenged. The Mondalins fell into debt because they had to pay for their son's hospital bills. The only way to finance this was to take out costly loans and sell most of the produce from the farm along with their assets. This resulted in severe food shortage for the family.

Stories like these are not uncommon. Small and marginal farmers form the majority of the third world's population; they have few resources, but usually multiple types of assets (e.g. less than an acre of land with a field, a homestead, little livestock and a pond). The soil condition of their land is usually poor and they practise continuous monocropping. They commonly have less than USD250 to invest per acre by borrowing and do not earn any significant profit, they are thus trapped between subsistence farming and meeting market demands. These factors need to be considered from a holistic perspective.

However, before the shift towards a market-driven agricultural system, a less energy-intensive, more eco-friendly production system was in place. Now markets dictate what food to grow and sell, the income from which is then used to buy food from the market. Some sell or lease out their land to big commercial farmers and become daily labourers or shared croppers on their own land – or migrated to cities.

To tackle these issues the concept of Sustainable Integrated Farming Systems (SIFS) for small and marginal farmers has emerged as an improved version of mixed cropping. SIFS imitates nature by not only utilizing crops for production, but also varied types of plants, animals, bird, fish, as well as other aquatic flora and fauna. These are combined in such a way and proportion that each element helps the other; the waste of one is recycled as resource for the other.

## 1.2 Objectives

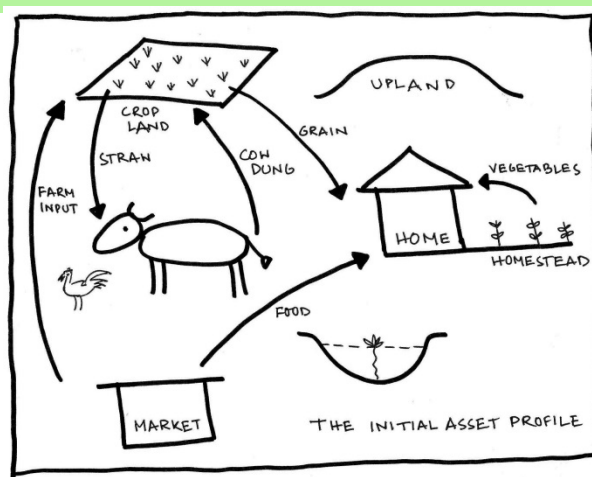
Practising SIFS with small and marginal farmers pursues the following objectives:

- Improve household food, nutrition and livelihood security
- Improve food, livelihood and income diversity
- Improve ecological sustainability
- Strengthen the local economy

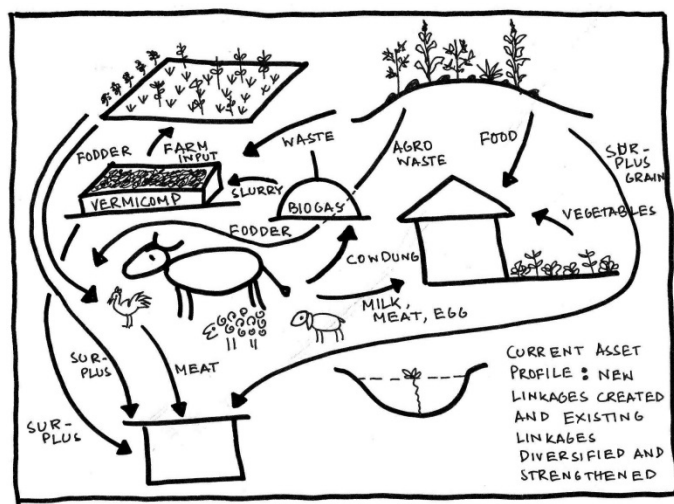
### Case Study: The Story of Dulal Hansda

Dulal Hansda, Male (45) owns 4 bigha crop land (1 bigha = 1/3<sup>rd</sup> acre), 2 bullocks, 1 cow, 1 bigha of upland, 3 chickens, a space beside his homestead and a small pond. Dulal lives in the dry district Bankura Bankura (West Bengal, India), which is characterized by a moderately undulated terrain with high quantum of top-soil run off. Until 2011 he barely managed to produce 15 quintals of paddy (1 quintal = 100 kg; 100 kg of paddy produce 70 kg of rice) annually only during the rainy season from his 4 bigha of low land. For that he needed 1,200 INR per bigha for chemical fertilizer. 1 bigha of the upland permanently remained fallow. The food produced on his entire farm could only sustain him and his family for 6~7 months, the rest he had to manage with his earnings as wage labourer.

Dulal heard about the SIFS farming approach during an awareness session by the Welthungerhilfe partner organization DRCSC and took the challenge to turn his life around. The intervention began with **planning** his farm so that his resources could be utilized fully to reduce his stress period and fulfil his needs. He planned to start with his 1 bigha of upland, where, in the rainy season of 2012, he introduced **soil-water conservation** measures and planted local varieties of roselle, maize and pigeon pea in rows and some leguminous vegetables in between. This entire effort of **mixing short and long duration crop** with legumes was the first step to developing the soil structure and checking top soil erosion. The upland now remains fallow for only 3 months during summer.



With 3 cows, Dulal had considerable amount of cow dung, which he sometimes used for farm yard manure or directly in its original form. He started making high temperature **heap and pit compost** to get better quality manure by mixing both dried and green crop waste with chicken faeces; and also introduced earthworms to produce **vermicompost** in a pit. In late 2012, he added **biogas** with state subsidies. The biogas is now providing energy for cooking and saves 300 kg firewood per month (equivalent to INR 1800). The slurry is used as vermin-feed. Cow dung is also used as fish feed and for producing **liquid manure** by mixing it with medicinal herbs and cow urine both as growth enhancer and pest repellent.



During 2012 rainy season, Dulal initiated **organic farming** on his 2 bighas of land. On 1 bigha he tried **single stick paddy cultivation** to maximize growth. During the 2013 rainy season, he switched over to completely organic methods of paddy cultivation. He treated his land with Neem cake and applied 3 quintal vermicompost per bigha. He controlled pests through pheromone traps and other **NPM methods**. He also tried to introduce **sacks** inside the paddy field for growing vegetables to serve the needs of his family. He also used his **field dykes** to grow black gram. In his homestead, he planted mixed vegetables according to the needs of the family. During winter 2012 he for the first time

divided his 4 bighas of land to separately sow mustard, wheat and potato, leafy vegetables and onions together – all organic. After accomplishing self-sufficiency in farm manure, he could sell an amount of 5Q vermicompost and few hundred vermin to other farmers. He bought a goat and 2 sheep from the money he earned. His livestock and hens are now getting better fodder from various types of crop residues. Animal shelter was also an initiative which was not practiced earlier, which he now uses to **collect cow urine**.

A quick look into his farm economics in 2013 reveals that within 2 years of intervention, the subsistence and farm input needs of Dulal are met from his small but diversified asset profile – which was only possible because he recycled all the agro-waste (byproducts) efficiently and linked various components carefully.

This is the second year – Dulal is expecting to complete the integration by the next year. He has plans of integrating missing components of trees for food, fodder and mulching material; increasing the number of livestock so that the cash income increases. He could not integrate well his small pond – which he will do soon.

Source: SIFS/DRCS, 2014

### 1.3 Concept: What is SIFS

One can learn about diversity from natural ecosystems such as forests and rivers. Forests and aquatic systems are self-supportive ecosystems which have formed symbiotic relationships with dependent communities/components. Main factors are diversification and tight recycling of waste. In commercial farming only a few types of vegetable are grown and large areas are planted with a small number of varieties. This uniformity makes it easy to manage, but also makes the production system unstable and vulnerable to pests and diseases. Diversity in plant species and crops cultivated keeps pests away and can play an important role in preserving food habits and cultural traditions.

The concept of SIFS has developed from the idea of imitating nature through **collaboration, multilayer arrangements and energy recycling, by carefully combining different elements. In SIFS, overall production, income and nutrition (food and fodder) are enhanced and diversified both in terms of quantity and quality.** The incidence of risk is reduced and the system becomes energy efficient as a whole. It also integrates various techniques like soil water conservation, energy security, rainwater harvesting, cropping sequence management and multitier arrangement for better management of space and utilization of time by increasing cropping intensity and decreasing fallow periods.

*"I used to produce only 15-20 quintal paddy from 160 decimal of land in traditional method, but previous year I produced 30 quintal from 60 decimal only by KPS. This year I will do 100 decimal with the new method. Cost of fertilizers is increased, so in this season I will use little amount of Urea as I know methods of growing rice with compost."*

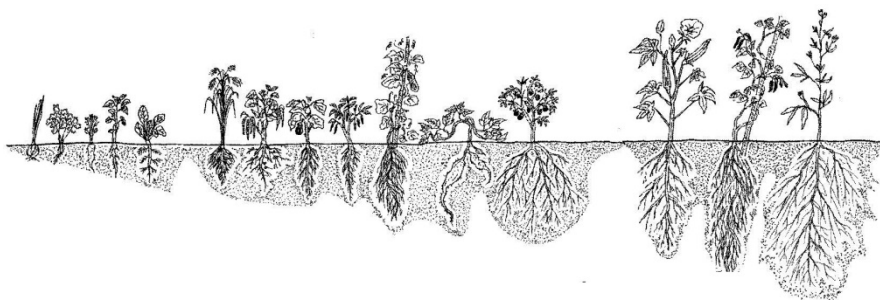
– Kedar Sing, Jharkhand, India

SIFS is about following 3 main principles.

#### (1) Cropping sequence

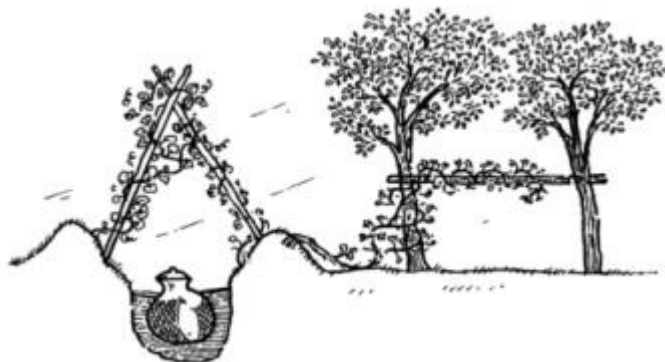
An appropriate cropping methodology has to be followed so that there is:

- *Less competition for food:* This is achieved by a combination of low, medium (e.g. herbs) and heavy feeding crops (e.g. cereals, fruits) as well as soil building plants (legumes).
- *Space available for proper root system:* The roots of different plants attain different depths, so a proper combination of plants with different root depths helps minimise inter-crop competition for soil sap.
- *Longer duration of cropping season:* One of the main aims of SIFS is to minimise the lean period in the field. The intercropping should be done in such a way that the field never remains vacant or unproductive.
- *Pest control:* Companion crops are sometimes helpful in pest control. Proper selection of some trap or pest repellent crops as part of the mixed cropping can reduce pest attacks considerably.



## (2) Multistorey arrangement

Most natural ecosystems in tropical regions are multi-level arrangements. High levels of interaction between biotic and abiotic components and multiple energy exchange routes make a natural ecosystem resilient, self-maintaining and highly productive. Moreover, productivity improves over time, unlike as in agro-ecosystems. If farms and gardens are redesigned to mimic the structures and functions of natural ecosystems, they will be more feasible and sustainable. The three rules regarding multistorey farming are:



order of height from east to west, so that each plant gets equal sunlight.

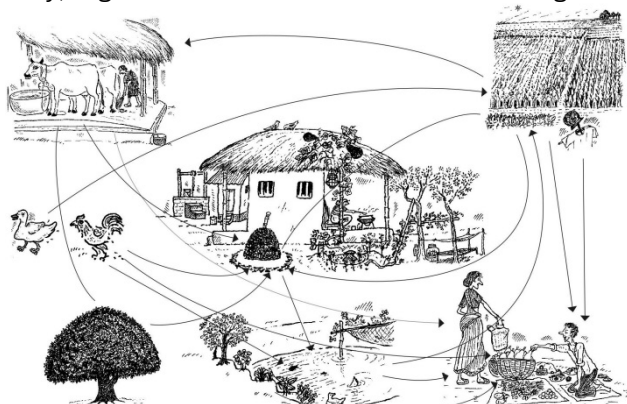
- The roots of the planted vegetables should be of different types and draw water and nutrients from different layers of soil.
- The vegetables should be identified in such manner that the food security of family is effectively maintained, i.e. combination of leafy vegetables, cereals, legumes, etc. So that:
  - ✓ The total available area is effectively used.
  - ✓ The cultivated crops get adequate soil sap.
  - ✓ The plants get the sunlight they require.
  - ✓ The plants cooperate with each other during growth.
  - ✓ Soil fertility remains intact.

## (3) Integrating subsystems and various components

Next to diversification, integration is the most important aspect of sustainable resource management. In ecologically integrated farming systems, closer integration is attempted within each farm/garden/pond etc. at the level of nutrient exchange as well as at the functional level. Therefore inter and intra subsystem linkages are established.

Animals such as pigs, rabbits, goats, cows, chicken and ducks can be introduced to obtain waste products as a source of nutrients and other functional inputs. It is very important to carefully select the different components so that they interact positively; e.g. chickens can be destructive in a vegetable garden, but in a fruit orchard, they can keep the pests/weeds under control. In a garden some plants/birds/animals etc. are deliberately introduced, while other living things grow by themselves or come to the garden if a suitable environment is created or food/water/shelter is provided. The focus is on integrating the following elements into the production system:

- Birds and animals (wild and domestic)
- Perennial plants (wild and domestic)
- Aquatic plants and organisms (wild and domestic)<sup>1</sup>
- Micro flora and fauna (mushrooms etc.)



<sup>1</sup> Often requires farmers to make space through land shaping  
Sustainable Integrated Farming System / Welthungerhilfe



- Insects (wild and domestic)<sup>2</sup>
- Seasonal and annual plants (wild and domestic)

Other important principles of the SIFS design are:

- (4) Replacing fossil fuels with renewable energy
- (5) Treating soil as a live medium and abandoning the use of synthetic pesticides and biocides
- (6) Looking for opportunities in problems

Examples are trials to use water hyacinth and other aquatic weeds as mulch and composting material, termites to feed chicken and fish, pond bottom silt to improve sandy soil or rice husk ash to amend clayey soil.

#### 1.4 Suggested indicators for SIFS interventions

##### Process indicators

- All farmers are member of a farmer group
- All farmers are actively participating in the peer learning process of capacity building
- All farmers follow the step by step farm planning process

##### Outcome indicators

- Farmers are following improved sustainable agriculture practices
- Local crops/breeds are promoted and the diversity of these are increased
- All farmers have at least 3 productive subsystems
- Food availability is increased
- Diet diversity is increased
- Household income is increased

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<sup>2</sup> Beekeeping for example can help in pollination and income generation  
Sustainable Integrated Farming System / Welthungerhilfe

## 1.5 Examples of SIFS in various agro-ecological zone

### Case Study: Aitaram Chepang

Location: Shaktikhor VDC - 4, Gairigaon, Chitwan District (Hilly Region), Nepal

Aitaram Chepang is a hard working farmer from Shaktikhor VDC - 4, Gairigaon, Chitwan District, Nepal. Aitaram has to meet the needs of a family of six from a small piece of farmland of 0.2 ha and with little livestock. They were very highly vulnerable to sudden mishap, climatic vagaries, epidemics and overall decreasing trend in farm production.

Before joining the SIFS group in the village, Aitaram used to grow maize, millet, buckwheat, wheat etc., through traditional agricultural methods. The produce was insufficient for his subsistence needs. Through SIFS he received capacity building training on nursery management, foliar fertilizer/pesticide preparation, kitchen fishery, improved livestock shed construction, vermicompost preparation, goat farming, seasonal and off-season vegetable production, fruit farming etc. These trainings motivated him to try vegetable farming, which was further supported by the project through improved variety of vegetable seeds and technical backstopping.

Aitaram transplanted tomato seedlings in 0.034 ha of land and adopted organic farming practices. His family started harvesting tomato after two months and earned NRS 24,000 from the sale of 800 kg tomato at the local and the nearby market centers (minus home consumption). In addition he also produced 20 kg seed four season bean seeds on 0.034 ha of land in 2012.

This was just the beginning. Later he improved his cowshed so that he can collect cow urine and dung. The cows are also healthier now. He dug one seasonal small pond for watering his kitchen garden for subsistence and a bigger perennial pond for fish rearing. Now chili has also been added to the list of marketable product. Aitaram has started saving money, after paying the food and education expenses over the season. Now he is one of the resource farmers in the group, giving training to the other farmers using his field as a living practical school.

Source: SIFS/Forward Nepal, 2014

### Case Study: Umraching Marma

Location: Chittagong Hill Tracts, Bangladesh

Umraching Marma, a tribal woman of Gonjo Para, Golabari Union, Khagrachari Sadar shoulders the family responsibility as her husband doesn't earn enough to contribute to the family's income. Mostly having to migrate as an unskilled laborer, Umraching's husband would also stay away from home for long periods of time. Umraching found it extremely difficult to manage her family of two sons, one daughter and her ailing old mother. She also has to tend towards her 0.08 ha of homestead lands, 0.32 ha arable lands at the river side and a cow.

Since 2012, Umraching participates in the Sustainable Integrated Farming Systems project implemented by Anando and supported by Welthungerhilfe. She took part in a training on multi-cropping, using space and time to reduce fallows, recycling of waste from livestock and poultry to reduce input cost of production and linking surplus with the market. Umraching changed her fortune and she is now one of the most successful farmers in her village. Known as the lady with golden hands, Umraching boasts of 50 perennial fruit trees; pineapple and banana cultivation as cash crops and intercropping cultivation with 12~15 types of crop in the fruit orchard. She also practices various composting technologies, organic plant protection methods, various micro irrigation techniques, seed preservation and also helps in propagation of these improved technologies through her group members. Umraching has also taken a lead in marketing her products in the local markets through various market techniques such as sorting, grading and cooperative marketing. She earned an additional income of 40,000 BDT in the winter season of 2013 and is expecting to earn 60,000 BDT in the next rainy season after meeting the needs of her family. She has now 4 cows and 14 poultry birds and planning to buy one a pump to irrigate her land from the nearby river.

*"I never knew that a small piece of land could give me so much of security. I am now looking forward to transfer the knowledge to my other group members so that they too can avail the benefits of the integrated farming systems."*

- Umraching Marma

Source: SIFS/Anando, Bangladesh, 2013

### Case Study: Govind Marandi

Location: Basulia, Tatkiyo Panchayat, Chhatanagpur Plateau, Jharkhand, India

Basulia village has no access road like many other villages of Devipur block, which is the poorest block of the district, in terms of poor access to inputs, resources and facilities, availability of water as well as the harsh condition of soil. The people, largely tribals, mainly relied on nearby forest and subsistence paddy farming. With time, life became even more difficult since forest diversity has started to decrease. The production from own farm lands was minimal. Major part of homestead land remained fallow and people used to migrate in search of their livelihood.

Govind Marandi is a poor tribal marginal farmer in Basulia. Govind is physically challenged with a left leg deformity he has had since childhood. Govind studied up to class V and then started to work to support his family. Despite of having 1 acre of paddy field that remained mostly fallow, his family of 5 managed to ensure food throughout the year. Other uplands in the village, where he has 3.5 acre of share, remain almost untouched due to lack of irrigation water. He has few fruit trees, one buffalo, 1 ox, 6 goats and sheep and 4 pigs.

In Basulia, like in many other villages, land constraint is not an issue, but the large land remains fallow and is therefore vulnerable to soil erosion. SIFS addressed this issue. A lift irrigation, which supported lifting water from the nearby stream to the fallow upland, changed the lives of 35 farmers who together own 50 acres of land, of which Govind owns 2 acres. Farmers contributed by developing the field bunds in the command area of lift on their plots and the earthwork in trench filling for lift.

With new motivation, Govind planned for soil water conservation through farm bunding and therefore repaired the water channel in his fields. Soon he diversified the total number of crops in his field from 2~3 to 19 during Kharif 2012 including Paddy, Okra, Maize, Finger Millet etc. SRI on 0.5 acre of land gave him 6.8 quintal of paddy instead of the 4 quintal he used to get earlier. For paddy cultivation, he mobilized seeds from PAACCS under Government scheme. He was also helped to access the government scheme to get a pump set. For the first time in Rabi 2012, he ploughed his so far barren land for wheat, potato, brinjal, onion, chili, cauliflower, cabbage, mustard, pigeon peas, beans etc. along with vegetable cultivation in mixed cropping on his homestead land.

After the initial orientation on the integrated system, which also discussed the integration of birds and other animals into the whole farm production, Govind was interested to initiate poultry farming. He was supported with 200 chicks and one cycle of feed. The shed he built on his own. At present there are 40 birds at Govind's farm, which is the optimal number. The cycle is discontinued for four month between May to August, due to summer and the reduced market demand. But this is not an issue: Govind has found his way to maintain a balance between production and market demand. But he suffered a huge loss as a result of the bird flu last year. To overcome this challenge Govind has come out with the appropriate solution: he bought older stock from nearby market, which was already immunized, and reared the ready stock in his shed until he could sell it at a higher price later that year. The chicken faeces is collected regularly and used for the field crops after decomposition. A part of maize grown in his field and its residue is utilized as feed for the chicken, which significantly reduces the cost of production. At home, Govind no longer wastes dung from his buffalo and ox by dumping it in the open as he used to. Instead, he has started making compost in a pit and is using as an important source of nutrition. He also has low-cost rooftop water harvesting for his livestock during summer.

His overall income is now 3000 INR per month on an average from poultry farming and 1500 INR as cash income from farm fields apart from household consumption. He has also started a small grocery shop from his savings.

Govind likes to experiment with his farm and introduced intercropping of maize, pigeon pea and roselle. He also plans to try out using sunflower plantation on the field bund during Ravi and marigold and coriander, which he gathered from other villages, for pest control. Vermicomposting and planting nitrogen fixing trees for fodder and soil health is also in his future plans.

*“Earlier, spending a 100 Rupee was a dream, now I always have at least 500 Rupee in my pocket.”*  
– Govind Marandi

Source: SIFS/CWS-Avibhyakti Foundation, India, 2014

## 1.6 Why this Manual

This manual is targeted towards field facilitators who can support small and marginal farmers in resource stressed / disaster prone region, wanting to take up SIFS as a farming method in South Asia. The manual outlines step by step processes, criteria, sessions, tools and methods for planning as well as capacity building through Participatory Learning Approach (PLA) cycle so that any organization can take up SIFS as an approach and a process. It provides:

- (1) A clear framework for facilitating Participatory Learning and Action of farmers and farmer groups.
- (2) Scope of improvement for the effectiveness of existing processes through systematic monitoring, assessment and quality control.
- (3) Welthungerhilfe and partners with a clear system to promote SIFS at larger scale and with a clear plan.

The approach supports farmers to take the lead in the entire PLA process, so that the farmers:

- Become innovative, self-reliant, analytic and technologically sound;
- Are capacitated to assess their own resource, strengths and stress factors and come up with a SIFS design of their own farm;
- Are trained through principles of Farmer Field School (FFS) in multiple skills and equipped with knowledge required to realize and improve their own SIFS farms; and
- Work in groups and form cooperatives to strengthen solidarity among the community.

The focus of this manual is to improve farm planning, production and related sustainability. However, the manual:

- Does not directly dealing with Linking Agriculture, Natural Resources and Nutrition (LANN)<sup>3</sup>, though the topic is an integral part of the overall idea
- Does not include marketing training, value chain analysis and other value addition topics
- Does not deal in detail with techniques of soil water conservation, energy issues and sustainable agriculture. Instead, it is a *framework* to deal with all this in an integrated manner to achieve nutrition and livelihood security.
- This manual mainly focuses of individual and common farm development mostly, but encourages watershed based development initiatives.



<sup>3</sup> Refer to LANN PLA manual by Welthungerhilfe, South Asia



## 1.7 Overview of SIFS PLA

### Assumption/definitions for SIFS PLA

- The entire PLA cycle is expected to be facilitated by the field facilitator. There should be one field facilitator for 3~4 villages.
- The entire timeline for PLA is designed for 1 community of 3~4 contiguous villages with 1~3 farmer's group with 15~20 members per group.
- There can be 3~4 contiguous villages in a community, 1~3

groups  in a village and 1~3 resource farmers  per group. Those resource farmers, along with other interested farmers will be selected for the PLA. For each meeting, the size of the group should not exceed 20.

- The resource farmers demonstrate SIFS model on their own and are willing to train others using their field as a FFS.



### The SIFS PLA Cycle Timeline

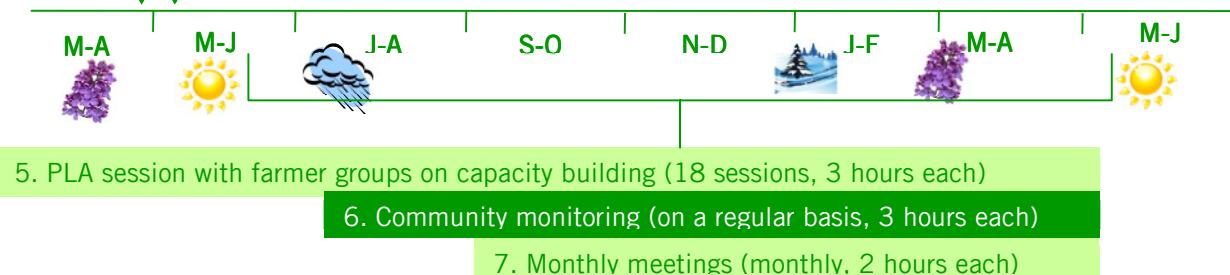
#### 0. Planning your project and PLA (20 working days)

1. Project familiarization and getting to know the village (2 sessions, 4 hours each)

2. Targeting beneficiaries, forming groups (2 sessions, 3 hours each)

3. Analyzing seasonality and resources (4 sessions, 4 hours each)

4. Farm planning (individual and group level) (2 sessions, 4 hours each)



\* M indicates March on the extreme left, next alphabets are the months.

**Pre-PLA session:** Selection of location, forming project team, project budgeting, targeting villages, stakeholder analysis, training of facilitator. This stage should be completed within 20 working days.

The PLA cycle consists of 3 phases to be completed in 12 months:

- **The preparation and joint planning in the community:** 2 meetings for project familiarization and getting to know the village + 2 meetings on targeting beneficiaries and forming group during month 1.
- **Planning the farm:** 4 meetings on understanding seasonality, resources, food sources + 2 meetings at individual and group levels during month 2 and 3.
- **Capacity building, implementation and monitoring together:** 18 sessions on technical capacity building depending on the availability and need of the farmer + community monitoring in every harvesting season + monthly meetings during month 4 to 12.

**For more information see/contact:**

1. BIOFARM : Action Research on Integrated Farming System: Ecology and Economics by SEED/Department of Science and Technology (GoI) and DRCSC
2. Biofarm booklet series by DRCSC, [drcsc.ind@gmail.com](mailto:drcsc.ind@gmail.com)
3. Project Directorate for Farming System Research: <http://www.pdfsr.ernet.in/otherpublication.html>

## 2 SIFS PLA in Overview

### 2.1 Designing a Project (for the Facilitating Organisation)

#### 2.1.1 Selection of Location (District/Block)

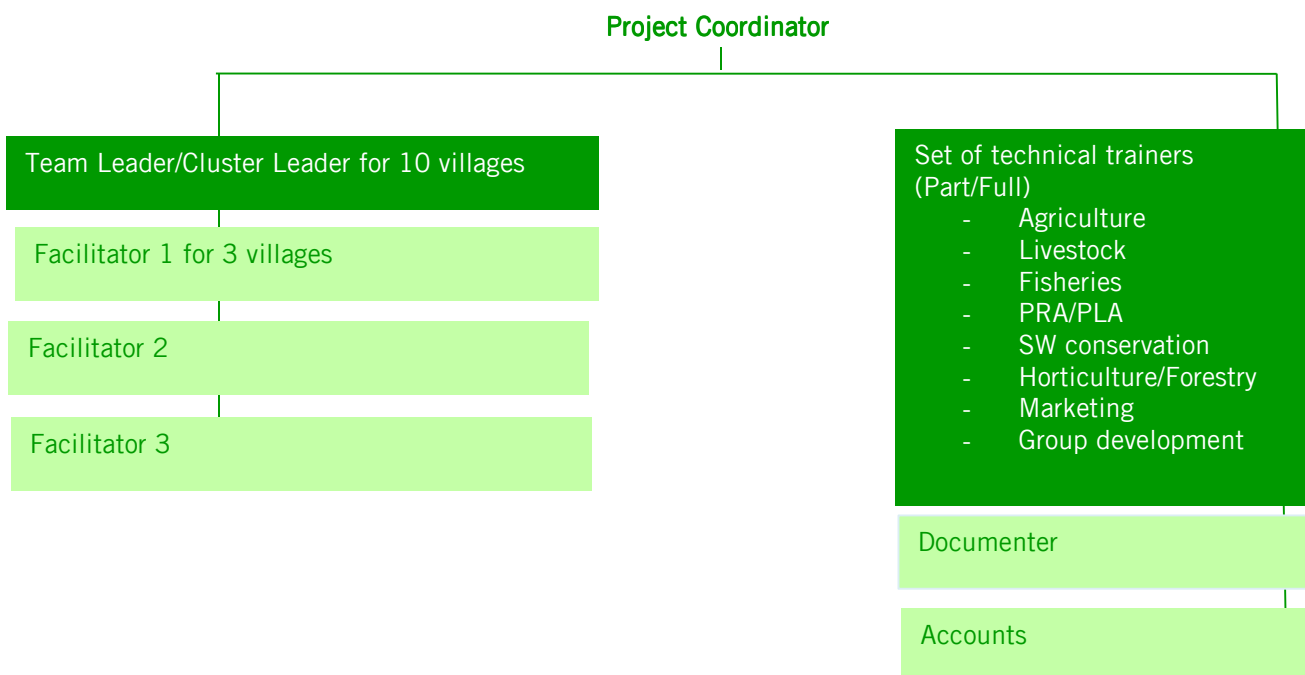
Material needed:

- Maps of the district/block etc.
- Statistical handbook of the district
- National population survey data
- Government's 5 year plan
- National and state climate change action plan
- Agriculture/livestock/soil water conservation/irrigation plans and studies

Suggested selection criteria:

- Small and Marginal Farmer dominated area
- Social factors: Indigenous/Dalit/minority community, access to mainstream resources/transportation/market
- Economic factors: Land holding/assets/ application of technology in production system
- Environmental factors: Disaster proneness/length of fallow season/ forest fringe/high altitude/threats of climatic changes

#### 2.1.2 Project team



It is assumed that one facilitator is responsible for 1 community of 3~4 contiguous villages with 5~6 farmer's group with 15~20 members per group.

### 2.1.3 Items needed for Farmer Groups (Budgeting)

#### *Requirements for Group Activity*

S.No	Activity	Remarks
1	Seed bank	At cluster level
2	Fodder bank	At village level
3	Common facilities	Pump set, weeder, sprayer, processing unit etc.
4	S/W conservation	River lift irrigation, irrigation channel

#### *Input Requirements of an Individual SIFS Farm*

S.No	Activity	Remarks
1	Provision of seed	Mixed seed with cereals, pulses, oil seed and vegetable according to the agro-climatic zone with techniques like mixed/inter cropping, companion crop.
2	Land preparation, land shaping and other structures	For water harvesting, accommodating aquaculture, providing lifesaving irrigation. It can be in a form of small pond, ditch, canal, dug well, field bund etc. Structures for multitier garden with net, scaffold etc. Farmers also should contribute his/her labour.
3	Cost of small livestock/poultry/fish and shed	For manure, ex. Chicken shed over pond can supply nutrient to the fish. Can be farmer's own contribution.
4	Nutrient management, water management, plant protection	Methods like drip irrigation, pitcher irrigation, mulching, introduction of NF trees across field bund for fodder & biomass for manuring, liquid manure, biofertiliser, vermicomposting, composting, green manure, panchgavya, bio-pest repellents etc.

### 2.1.4 Targeting Villages


Suggested selection criteria:

- Small and Marginal Farmer dominated area
- Social factors: Indigenous/Dalit/minority community, access to mainstream resources/transportation/market
- Economic factors: Land holding/assets/ application of technology in production system
- Environmental factors: Disaster proneness/length of fallow season/forest fringe/high altitude/threats of climatic changes
- Are there any initiatives from the government/NGOs?
- Are there any local CBO/farmer's group/youth club etc.?




You may go through the following processes

- Visit the location physically, collect simple information
- Meet the local government to collect information and suggestions
- Informal meetings with local CBOs, youth club, political leaders, religious leaders to learn about cohesiveness, willingness to work etc.
- Select village clusters according to the above information and available resources.

### 2.1.5 Stakeholder Analysis Module

 Objective	<ul style="list-style-type: none"> <li>▪ Identification of relevant stakeholders and their possible influence on the project.</li> <li>▪ Identification of relevant stakeholders who can play a guiding/supporting role in the PLA process.</li> </ul>
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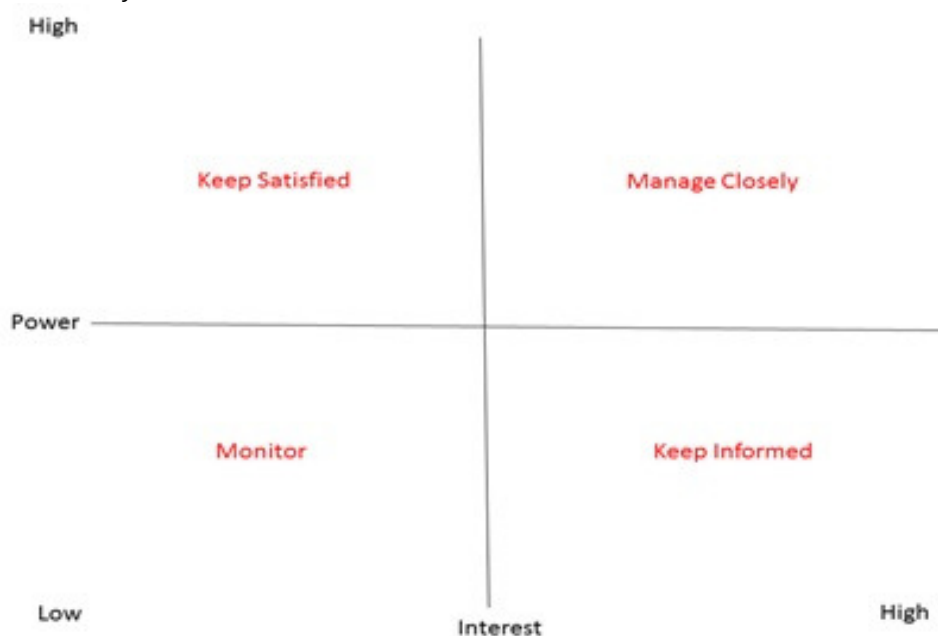
 Participants	The project team along with representatives from a village cluster
 Duration	3 hours
 Material	Chart paper, sketch pens, scotch tape

### Process

The first step is to brainstorm who the relevant stakeholders are: Think of all the people/organisations who are affected by your work, who have influence on or power over it or have an interest in its successful or unsuccessful conclusion. Remember that although stakeholders may be both organizations and people, ultimately you must communicate with people. Make sure that you identify the correct individual stakeholders within a stakeholder organization.

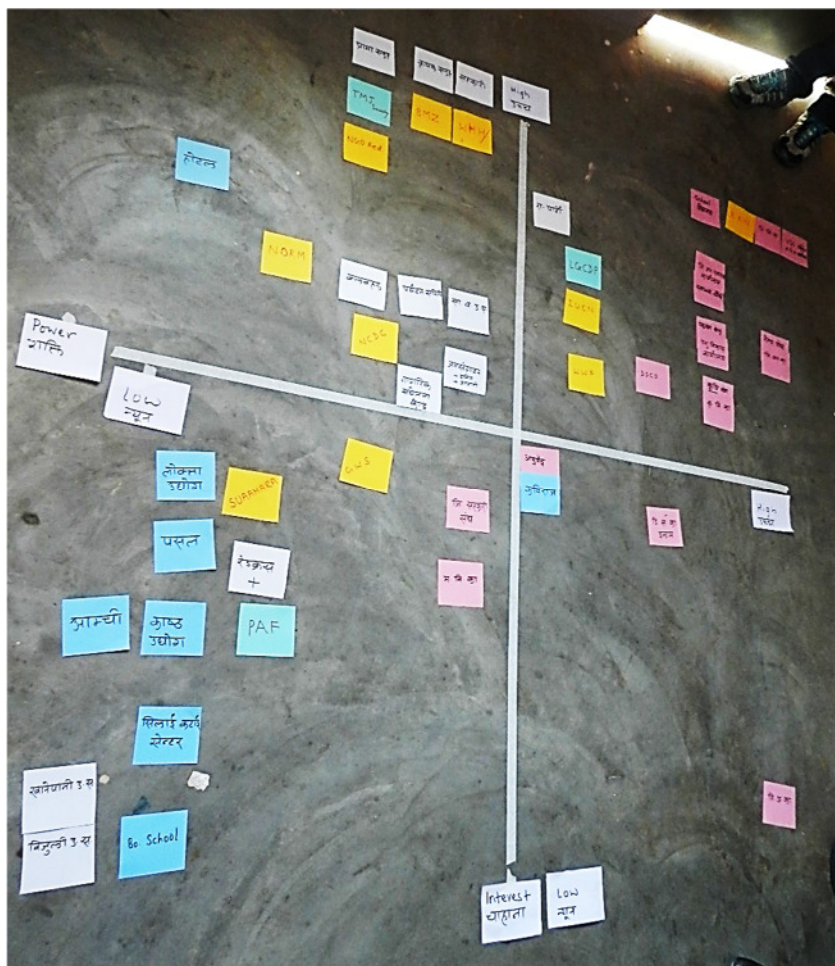
Then write down the names in small cards made out of chart paper.

Third, map out your stakeholders on a power/interest grid, and classify them by their power over your work and by their interest in your work:



Someone's position on the grid shows the action that should be taken with them:

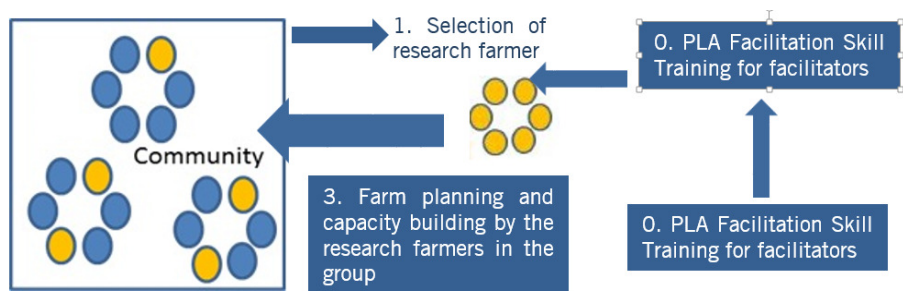
- High power, interested people: these are the people you must fully engage and make the greatest efforts to satisfy.
- High power, less interested people: put enough work in with these people to keep them satisfied, but not so much that they become bored with your message.
- Low power, interested people: keep these people adequately informed, and talk to them to ensure that no major issues are arising. These people can often be very helpful with the detail of your project.
- Low power, less interested people: again, monitor these people, but do not bore them with excessive communication.



You now need to know more about your key stakeholders. You need to know how they are likely to feel about and react to your project. You also need to know how best to engage them in your project and how best to communicate with them. Plan accordingly on how you want to involve them in your project. Is there anyone, whom you can use as resource person in you PLA sessions? It would also be interesting to note down all the existing support from various stakeholders, especially government departments that can be utilized for the beneficiaries.

*Stakeholder analysis example from Nepal*

## 2.2 Upscaling SIFS PLA



Resource farmers hold a key role in upscaling the project idea. This manual has been designed for the facilitators, who will try the techniques and processes with the resource farmers in practical session in their own field. So during the process, the farm of the resource farmer becomes a living farm demonstration field. The resource farmer in turn will train other farmers with the FFS method. Resource farmers will in essence act as a grassroots trainer in the future, who can assist/provide support to anyone in the community who wants to build a SIFS – they can even provide capacity building services for the government projects as well.

## 2.3 Training the Facilitator





### 2.3.1 Selecting the Facilitators

- The facilitator should preferably be local and know the local language.
- S/he should have basic literacy and at least 10 years of schooling.
- S/he should have basic knowledge of agriculture, soil water conservation etc.
- S/he should have good leadership and communication skills.
- S/he should be able to resolve problems/conflicts in the group.
- S/he should be sympathetic to the cause.
- S/he should be mobile and have family support for conducting meetings.

### 2.3.2 Expectations from the Facilitators

- Decide the sequence of the PLA meetings according to need and season.
- At the start of every meeting, make the objective of the meeting clear to the participants.
- Use the methodology prescribed in the manual and adapts it to the local context.
- Try to complete the meetings in the given time frame.
- Encourage participation of farmers through interactive processes, e.g. dialogues and discussions.
- More importantly, act as a liaison in terms to encourage knowledge flow between farmers.
- Summarize the learning from the meeting at the end of it.
- Confirm the date, time, meeting place and the content of the next meeting .
- Discuss and finalise the process, date, time and place where the RFs will conduct the similar session with his group members.
- Be present/help in the sessions that will be conducted by the RFs.

### 2.3.3 Training Module for Facilitators: Facilitation Skills

 Objective	To improve the facilitation skills of the facilitators
 Participants	Facilitators and the resource farmers, facilitated by a resource person
 Duration	2 days, 5~6 hours a day
 Preparation	Prepare games, handouts and activities as explained below. Before that you need to select possible trainers



#### Process

#### Day 1

(1) After introduction, and discussion on objective of the workshop (30 Minutes) – 3 games are played:

#### **Game 1: What do good facilitators do?**

**Objective:** By the end of this session, participants will be able to name 2 differences between participatory facilitation and conventional teaching.

**Time : 1 hour**

**Steps:** (Note: This game should not take more than about 10 minutes before starting the discussion)

1. Invite participants to sit on the chairs in a circle, removing all extra chairs. Only the facilitator should be standing, so there is one less chair than people in the room (If chairs are not there, you can mark positions by chalk).

2. Explain: We are going to brainstorm the question: What do good training facilitators do? Whoever is left standing at the end of the game will add one new thing to the list. The game is called “Everybody Who”. You will say:

“Everybody who is wearing a red shirt should switch chairs”. And the person standing will try to find a seat among those who are changing chairs. Whoever is left standing will add one thing to our “Good Facilitator” list and then do another “Everybody Who”, and so on.

3. Demonstrate as needed, and play the game a few times.
4. Invite everyone to go back to their seats.
5. Look at the list of things a good facilitator does, and invite people to add in things, e.g.
  - Training preparation and setup ahead of time.
  - Facilitator assures all participants feel free to contribute.
  - Uses participatory methods.
  - Is able to focus the discussion back on topic if it starts to drift.
6. Discuss and clarify anything needed, asking for tips on practical ways to do the items listed.

### Game 2: Participatory Facilitations vs. Conventional Training

**Objective:** To understand the difference between participatory facilitation and conventional training.

**Time :** 30 minutes

**Steps:**

1. Explain that participatory facilitation is important because most adults learn best when trainings are participatory, meaning they use a mixture of listening, seeing and doing. Facilitation of participatory training is different than conventional teaching like you might find in schools.
2. Divide training group into 2, and assign 1 group as “Participatory Facilitation” and the other as “Conventional Training”.
3. Give each group 5 minutes time to come up with a short (3 minute) skit showing us an example of what the respective type of training looks like. This skit does not need to be in-depth.
5. After 5 minutes, call “stop!”
6. Invite each group to briefly present on what they just observed from the other group, and ask the other group to look through the list and see if it is an accurate representation.

**Discuss:** During the group skits, were participants able to accurately demonstrate what their type of facilitation looks like? Are they able to identify the differences between the two in their comments and explanations?

### Game 3

**Objective:** To understand the processes of participatory farmer’s training.

**Time :** 1 Hour

**Step:**

1. Divide the participants into 3 groups.
2. Collect 30 stationery items known to everybody.
3. Call group A and only tell them the names of those, do not repeat.
4. Call group B and only show them same materials.
5. Call group C and only give them the materials to feel them.

And then, asked the group to write the name of the materials on a chart paper.

**Discussion:** It should come out that group C wrote the most names compared to other groups, while group A performed poorly. Why has this happened? Remember the old Chinese proverb – we hear, we forget, we see, we might forget, but we do, we remember forever. Which is really the essence of participatory farmer’s training - learning by doing.

- (2) End the day by discussing and listing principles of PLA cycles that we will follow<sup>4</sup> (**Time : 1 hour**)
  - **Learning by doing:** Adults do not change their behaviour and practices just because someone tells them what to do or how to change. They learn better through experience than from passive listening at lectures or demonstrations.

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<sup>4</sup> Source: FFS principles, AME Foundation  
Sustainable Integrated Farming System / Welthungerhilfe



- **Farmer-led learning activities:** Farmers, not the facilitator, decide what is relevant to them and what they want to learn. This ensures that the information is relevant and tailored to their actual needs. The facilitator simply guides the farmers.
- **Learning from mistakes:** Learning is an evolutionary process characterized by free and open communication, confrontation, acceptance, respect and the right to make mistakes. This last point is important as more is often learned from mistakes than from successes.
- **Learn how to learn:** Farmers are learning the necessary skills to improve their ability to observe and analyse their own problems and make conscious decisions.
- **Problem-posing/problem-solving:** Problems are presented as challenges, not constraints. Farmer groups learn different analytical methods to help them gain the ability to identify and solve any problem they may encounter in the field.
- **The farmer's field is the learning ground:** The field is the main learning tool. Each session will be conducted in one farmer's field and each farmer will practice this in his own field.
- **Extension workers are facilitators, not teachers:** Extension workers are used as facilitators because their role is to guide the learning process and not to teach. The facilitator contributes to the discussions and aims to reach consensus on what actions need to be taken.
- **Unity is strength:** Empowerment through collective action is essential. Farmers united in a group have more power than individuals. Also, when recognized as an active member within a group, the social role of individuals within a community is enhanced.
- **Every field is unique:** There is no unique solution or method applicable for all farms/farmers. That's why everybody will try whatever discussed in the session in his own farm, observe and share with others.
- **Systematic training process:** All PLA cycles should have a systematic training process.



*SIFS training at Kolkata, Welthungerhilfe*

**Day 2**

- (1) Recap of the day 1 (15 minutes)
- (2) Remember game 1 and 2 from previous day. Try to list what a facilitator should NOT do during facilitation. (30 minutes)
- (3) Break into two groups. Group 1 will prepare a chart on characteristics of an ideal facilitator. Group 2 will make a session plan on a relevant topic (vermicomposting, preparing feed for chicken etc.) and present. The two issues can be finalized followed by a discussion within 1 hour
- (4) Taking a cue from the above discussion, try to design a generic session plan for a PLA session. (30 Minutes)

A suggested generic plan

- 15 min - Last day's recap, discussion on homework
- 15 min - Explaining day's objective
- 15 min - Preparation for hands-on work
- 120 min – Hands-on work and/or experiment
- 10 min - Group games
- 20 min - Total break time given between activities
- 15 min - Planning the homework and plan of the next day
- 10 min - Recap of the day

- (5) Understanding SIFS PLA through presentation (1 hour)
- (6) Role clarity (30 min): Brainstorming on how the resource farmers will take the learning of the PLA sessions to other farmers.
- (7) Feedback session (15 min)

To know more

[www.raisingvoices.org/staffskills.php](http://www.raisingvoices.org/staffskills.php)

## 3 PLA Meetings

### 3.1 Overview of SIFS PLA

Table 1: Phase 1 - Preparation and Planning with the Community

Steps	Objectives	Meetings	Time Frame	Practiced by/with
Step 1: Project familiarization and getting to know the village	<ol style="list-style-type: none"> <li>1. The community realizes their own resources and possibilities of improvement</li> <li>2. The community understands the project purpose</li> </ol>	<ol style="list-style-type: none"> <li>1. Walking together - Transect Map</li> <li>2. What is your production system?</li> </ol>	2 sessions (à 4 hours) with each community	With the entire community
Step 2: Targeting farmers and farmer groups	<ol style="list-style-type: none"> <li>1. Selection of farmers, resource farmers</li> <li>2. Forming and strengthening groups</li> </ol>	<ol style="list-style-type: none"> <li>1. Targeting farmers</li> <li>2. Strengthening farmer groups</li> </ol>	2 sessions (à 3 hours) with each village community	With the village community

Steps	Objectives	Meeting	Time Frame	Practiced by
Step 3: Analyzing seasonality and resources	<ol style="list-style-type: none"> <li>1. Understand the seasonality of natural phenomena, production cycles and scarcity months in the village</li> <li>2. Farmers try to locate their resources and commons</li> <li>3. Possibilities around joint activities in common land</li> <li>4. Understanding SIFS in terms of resource flow</li> <li>5. Know about nutritional requirements</li> </ol>	<ol style="list-style-type: none"> <li>5. Understanding seasonality.</li> <li>6. Resources of your village.</li> <li>7. Know your food</li> <li>8. Understanding SIFS</li> </ol>	4 sessions (à 4 hours) with the groups	With the selected farmer group
Step 4: Farm planning	<ol style="list-style-type: none"> <li>1. Individual farmers can assess the resources and draw up an action plan and Capacity building needs</li> <li>2. Planning of the farmer group, joint activities, convergence of possibilities</li> </ol>	<ol style="list-style-type: none"> <li>9. Drawing up resource flow diagram and action plan</li> <li>10. Planning together</li> </ol>	1 PLA session (à 4 hours) farmer. + 1 sessions (à 3 hours) with the farmer group	Farmer groups



Table 2: Phase 2 - Farm Planning  
Table 3: Phase 3 - Capacity Building, Implementation and Joint Monitoring

Steps	Objectives	Time Frame	Practiced by
Step 5: Capacity building and implementation	Farmers learn from the facilitators and/or learn from each other on various skills required for establishing SIFS, and apply in their field.	18 PLA sessions @ 3 hours each, spread over 6~8 months as decided by the group. Clubbed with follow up training sessions in the larger group.	Farmer groups
Step 6: Joint monitoring	The farmer groups learn to conduct participatory monitoring tool	1 PLA session @ 2 hours, farmers will repeat the exercise at a suitable interval	Farmer groups
Step 7: Monthly meetings	The farmers reflect on the action and plan for the future.	Once in every month.	Farmer groups





### 3.2 Phase 1 - Preparation and Planning with the Community

#### Step 1: Project familiarization and knowing the village

**Objective of the step:** To familiarize the village with the project and the scope and possibilities to realize the project objectives.

**Content of the step:** 1. Transect Map 2. Group discussion for project familiarization

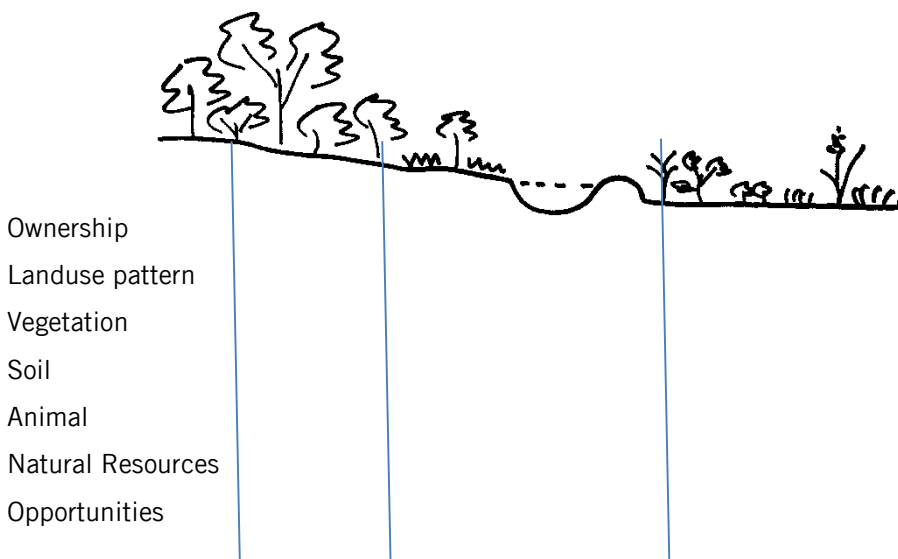
#### Meeting 1: Walking together - Transect Map

 Objective	To understand the resources, scope and possibilities of SIFS including NRM in the villages.
 Participants	Facilitator, community Involvement of children may be interesting in the process.
 Duration	2~3 hours
 Preparation	Identify community members knowledgeable of the area and willing to guide you in a walk across the 3~4 villages in the areas where the community derives its livelihood. Agree with the participants on the route the group will walk, taking into consideration items of interest like forest, farms, water intake, settlements, sacred areas, etc.

#### Process

(1) Walk along the agreed route, preferably doing a cross section of the location. Do not rush. Observe and discuss issues with the participants. Let the community guide and teach you. Do not lecture. Take notes. Encourage participants to identify potentials and constraints along the route and in ecosystems you come across. Interact with people you encounter along the way to collect additional information.

(2) Try to use appreciative queries, so that people feel proud of their area.



*The Transect Matrix*







*Transect under progress in Jharkhand, India*

- (3) Try to note down best practices, if any, you came across  
 (4) While analyzing, try to think about soil water conservation and plantation related work that can protect common property resources and make use of fallow lands through plantation etc.

**To know more :** [http://www.icra-edu.org/objects/anglolearn/Maps\\_&\\_transects-Guidelines.pdf](http://www.icra-edu.org/objects/anglolearn/Maps_&_transects-Guidelines.pdf)

### Meeting 2: What is your Production System?

 Objective	To learn about the production system of the community. To introduce the idea of the project to the community.
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 Participants	Facilitator, community
 Duration	3~4 hours
 Preparation	Film, film projection facility, bring the community members from 3~4 villages together in a common place.

### Process

- (1) Film show
- (2) Initiate a group discussion using the following diagram



#### Discussion points:

- What do you see? Do you have all those sources of food and livelihood?
- Do you have anything more than this? What is its use?
- Does each one of these elements help each other? How they help?
- What do you need to have an ideal production system?

**Key message:** Creating linkages between various components may reduce your cost of production and risk, as well as increase diversity of nutrition and income.





Note the strength, opportunity and need while discussing. Also try to identify farmers, who are taking lead, have good communication skill.

## Step 2: Targeting Farmers and Farmer Groups

**Objective of the step:** To identify beneficiary and resource farmers and capacitate them.

**Content of the step:** 1. Selection of farmers and resource farmers 2. Forming and strengthening farmer groups

### Meeting 3: Targeting Farmers

 Objective	To identify beneficiaries and resource farmers.
 Participants	Facilitator, villager
 Duration	3~4 hours for one village + follow up on a consecutive day
 Preparation	Colour cards of 3 colours, chart paper, pen



#### Process

- (1) Organize a village meeting mostly with farming community
- (2) Ask the people what defines a poor, medium or better off persons in their village. Encourage the people to start a discussion, but do not let it get too heated. Interfere little, listen much.
- (3) Try to come down to 5~6 criteria. For example:

Criteria	Poor	Medium	Better off
Land holding	0-1 acre	1-3 acres	4+ acres
Hunger time	4-6 months	2-5 months	0-2 months
Land quality	Fallow/encroached land/Forest land	Infertile/seasonal fallow	Normal/Fertile
Livestock/poultry/fishery	Nothing/1 cow/2~3 Chickens	Chickens, goat, 2 cows	Chicken, goats, 3+ cow
Sources of cash income	Labour/ Migration, distress sale	Labour, Excess sold in the market	Excess sold in the market, other business/job
Collection from forest	Collects daily, regular income	Collects/sells occasionally	No dependency, only seasonal like fruits

*Wealth Ranking Matrix*

- (4) Distribute 3 colour cards to 3 groups according to criteria. For the project, we should consider poor to medium category farmers. List names of farmers in 3 categories.
- (5) Refer to the last session and share that this project will initially work with poor and medium farmers who are willing to
  - Take part in the initiative
  - Take risk
  - Experiment, to try new things as discussed earlier
  - Pay back input cost initially supported by the project
  - Go outside for training
  - Train others, share knowledge
  - Share seeds etc.





- (6) Come back another day to follow up on this.
- (7) During the discussion and from your previous experience, try to locate farmers who are
- Keeping own seeds
  - Innovative
  - Already recycling waste
  - Leaders
  - Good in communication
  - In control over others

They will be our resource farmers.

### Follow Up

Ask the community to discuss among themselves and decide who will be participating, keeping these criteria in mind form groups according to house clusters/location of fields.

### Meeting 4: Strengthening the Group

 Objective	Strengthening the group, setting rules and regulations.
 Participants	Facilitator, beneficiary farmers, who will be in the group
 Duration	3~4 hours + follow up
 Preparation	Preparation for the games



### Process

- (1) Play games

#### Game 1

Objective: To raise awareness about working together and communicating with each other.

Materials: Cloth to tie over the eyes

Steps:

1. Tie a cloth over the eyes so the participant can't see. Ask the participant to walk from a set starting position to a stool and hit it with a stick.
2. Let all participants try.

Discussion: Why can't we do simple things with our eyes covered? How could we have managed to do this task? What are the lessons we learn from this?

#### Game 2

Objective: To raise awareness about the importance of planning, collaboration and creativity when doing a collective assignment

Materials: Six sheets of A4 with a list of items to be collected listed on them:

(Example list: An old plastic bag, a pest infected leaf, a hat, a tuber crop, a handful of healthy soil, leaves from four different types of plants, a map of the village, a brush, a small mirror, a strip of tablets)

Duration: 10 minutes

Steps:

1. Ask the participants to divide themselves up into teams of equal size (approx. 5-6 per team).

2. Explain that each team will be given a list of items to collect and they will compete to see which team can collect and bring them back to the meeting place first. They have a maximum of 10 minutes.

3. Handout the lists to each team and then start timing.

4. After all groups have finished, check the items that were collected and give points for correct items. Extra points should be given for creativity. The group with the most points for speed, completeness and creativity is the winner.

Discussion: What strategies did the groups apply to divide tasks and collect the items? What worked well and what did not? What can we learn from this exercise?

(2) Small group discussion with following probing questions:

- Do we want to have a group?

- Why do we want a group? How will we be benefited if we form a group? Can't we get the same benefits as individuals?

### Followup

As a home task to the group, ask them to discuss these issues and finalise:

- Aim and objective of the group
- Membership criteria, fees, how to take new member, how to discontinue a member
- Structure – the office bearers
- Operations of the group – meeting, activity, decision making process

The facilitator might need to visit for follow up and group formation. Please note that this is just an introduction to the group. If required, it might be dealt with in separate sessions.

**To know more :** <http://usaskstudies.coop/pdf-files/FarmersAssocTrainingfinal.pdf>





## 3.3 Phase 2 – Farm Planning

### Step 3: Analysing Seasonality and Resources

**Objective of the step:** Farmers and the facilitator understand the seasonality of natural phenomena, production cycle and scarcity months in general. Farmers try to locate their resources, commons etc. to manage them in a better way.

**Content of the step:** 1. Seasonal calendar of scarcity of food, fodder, firewood, drinking and irrigation water, cash and work. Seasonality of temperature, rainfall and disasters. Seasonal calendar of crop in lowland/upland/garden, marketable products, wild food items and value addition. 2: Resource map of 3~4 contiguous villages and planning what can be done in common land/properties jointly by the group.
















### Meeting 5: Understanding seasonality

 Objective	Farmers and the facilitator understand the seasonality of natural phenomena, production cycles and scarcity months in general.
 Participants	Facilitator, farmer groups from 3~4 contiguous villages
 Duration	3~4 hours
 Preparation	Chart paper, pen

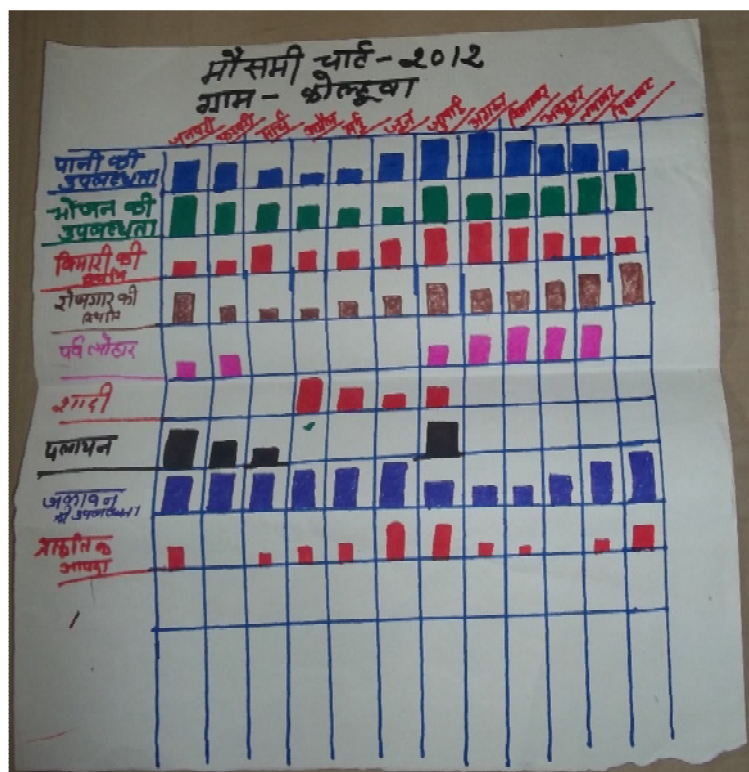


### Process



Seasonal Stress and Climate Matrix















Seasonal calendar from Deoghar, Jharkhand, India

Discussion points:

- The first row contains 6 seasons. The first column shows food, fodder, firewood, drinking water, irrigation water and cash, disaster/shock, rainfall and temperature.
- What is the seasonal availability and scarcity of the first 6 phenomena? How do you cope with scarcity? How does scarcity impact your nutrition status? The facilitator can use colour code, marks or numbers to denote availability.
- What is the seasonality of the last three items in the column? Is there any relationship between seasonality of natural phenomena and availability of the first 6?
- Can you think about new crops, new possibilities to address your scarcity?
- Can we utilise the natural phenomena positively to address the scarcity?







Seasonal Production Matrix

- The first column denotes lowland, homestead, upland, collection from wild, things sold in the market, things to be processed.
- Write names of crops/components/things in each box.
- Do you see any problem now, such as insufficient diversity, large gaps or missing market links?
- Do you change/rotate crops in consecutive years?
- Do you find any crops which were there in your childhood, but not now?
- Can you think natural phenomena like weather that are linked to this?
- Do you see any change in production over the years, particularly in relation with the climatic phenomena in the previous exercise?

### Meeting 6: Village Resources

 Objective	Farmers and facilitator understand the available natural resources through the use of the resource map.
 Participants	Facilitator, farmers from 3~4 contiguous villages
 Duration	3~4 hours
 Preparation	Base map/cadastral map of the 3~4 contiguous villages.

### Process







*Resource mapping from West Bengal, India*

- (1) Point out grazing land, common land, fallow land, forest, water resources like stream/river, pond etc.
- (2) Discuss what can be done to regenerate and use them in a sustainable manner through soil water conservation, plantation, common fisheries, fallow land cultivation etc.

#### To know more :

1. <http://www.fao.org/docrep/003/x5996e/x5996e06.htm>
2. Watershed based development- a source book/BGVS watershed programme

#### Meeting 7: Know your food

 Objective	Mapping locally available food.
 Participants	Facilitator, farmer group(s) from one village
 Duration	3 hours
 Preparation	Ask the participants to bring in all possible food items from the locality – cultivated and uncultivated, sheets of paper, pen



#### Process

- The facilitator will ask the members to put the food items collected by them on the floor/mat and ask about other food items which are available in the village but for some reason could not be collected for the meeting e.g. seasonal fruits and vegetables. S/he will write the responses in a sheet and place it near the food items.
- The facilitator will discuss with the group that food contains nutrients – substances which the body uses for growing and functioning. Food gives us energy to move, think and work. Food also contains important substances which keep our body strong and healthy, help boost our immune system and protect us from infections.
- S/he will encourage to discuss which types of food are required for what, and together, will divide them into 3 groups: body-

*"I forgot the cultivation practice and taste of Madua (Finger Millet). With the help of Suresh-ji (SIFS facilitator) I cultivated 5 decimal land and preserved seeds for this year. I will cultivate Madua on 10 decimal land this season."*

– Kedar Sing, India

building food (rich in proteins), protective food (rich in vitamins and minerals) and energy food (carbohydrates and fats).







*Know your food: Jharkahnd, India*

- After all the food items are put in the appropriate category the facilitator will encourage the members to include each of the food groups in their daily dietary intake for enriching their food especially during pregnancy and lactation, and include all items in the child's daily diet. The facilitator will especially talk about the need to add oil in each meal to increase the density in the complementary feeding of children between 6-59 months. S/he will also explain that dietary diversity is important, especially the intake of iron, calcium and folic acid rich foods. Therefore, it should be ensured that the family foods are enriched with a variety of colourful food items such as orange/red vegetables and fruits, green leafy vegetables, eggs, beans, lentils or peanuts. The baby should be also animal products (meat, liver, chicken, and fish) and milk whenever available, as these make the child grow healthy and strong.

The facilitator will stress all food groups are available at the village level and most of them can be either locally grown or collected for a balance diet.

### Meeting 8: Understanding SIFS

 Objective	Understanding the concept of biomass flow in integrated farming
 Participants	Facilitator, farmers group(s) from one village
 Duration	3 hours
 Preparation	Understand what a typical farm of the area looks like.





of the farm produce (rain-fed paddy) and sometimes his assets. This created a severe food and cash shortage for the family.

In the middle of this crisis, Pravat decided to switch to sustainable agricultural methods, and later on to integrated farming, having learned about it in an orientation session by DRCSC. Slowly he developed a nutrition garden on his fallow land in the bank of a pond next to his house. In the nutrition garden he cultivates 8-10 vegetables per season, mostly used for own consumption (he consumes vegetables of about 6000 INR a year from the garden). He also keeps seeds of all the vegetables. His 0.81 acre of land is now cultivated 3 times a year: (1) paddy and black gram in the rainy season, 0.37 acre for vegetable, pulses like lentil & field pea and oil seeds like mustered; (2) 0.44 acre of land for winter paddy; and (3) vegetables, sesame, black gram and green gram in summer on 0.3 acre of land. With his 3 cows, 1 bullock, 1calf, 3 goats and 2 hens he no longer depends on external inputs for organic manure for his entire production, as he also introduced a biogas and the slurry is used as manure and gas is used as fuel. The livestock feed is now managed with straw, mustard cake, pulses and other agri-waste. The hens are fed with food waste. He does not have any pond, but holds a share in 10 ponds in the village from which he earns a portion of his annual income.





Now, Pal's situation has transformed: he now has 5 subsystems, which positively interact with each other; waste products are consumed entirely within the system, which is reflected in being able to meet 70% of his farm inputs, 100% of his fodder and 100% of the fuel need with internal input (about 28,000 INR altogether). This has also lowered the production cost as input of INR 14,000 have been internally produced by recycling agro-waste with which he saves fuel of INR 6.500 per annum and fodder worth INR 7.500 is cultivated on his own field. They have managed to pay off part of their debt. Their income has increased as surplus production, seeds and seedlings are sold in the market after meeting all their family needs. The Pals hardly have to buy food now – they can rely on a steady supply of rice, oil, pulses, fish, milk, egg and vegetables throughout the year along with a net income of about INR 70,000 a year.

#### Step 4: Individual Farm Planning

**Objective of the step:** Individual farmers can assess their resources, draw up an action plan and identify capacity building needs.

**Content of the step:** Planning of farms.

#### Meeting 9: Developing a Resource Flow Diagram and Action Plan

 Objective	Planning an individual farm
 Participants	One to one discussions with farmers in presence of the group
 Duration	4 hours for 1 farm for the first visit, time required will gradually decrease.
 Preparation	Learn about the respective seasonality (look into the earlier exercise on seasonality)

 Process

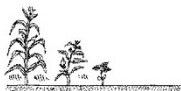
(1) Assessing resources



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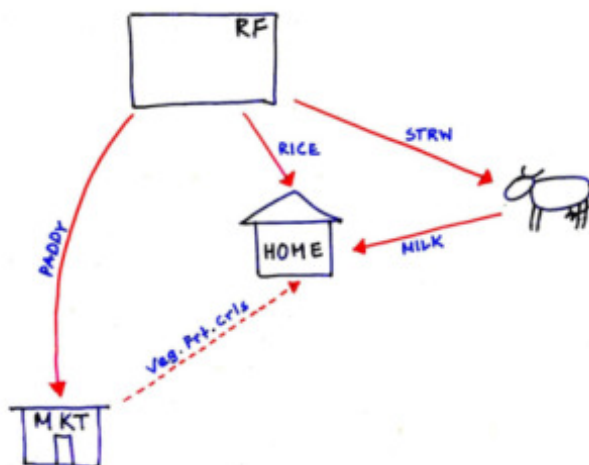
**Discussion Points**

- How many resources (low land, upland, poultry, big trees, farm equipment, family member, homestead space, pond, livestock and compost/agro waste) do you have? How do you use it? Can we use it in a better way?
- Also consider and write ploughing frequency, distances of farming areas from household, weeding style and frequency, transport after harvest, soil water conservation techniques, existing farm inputs, role of livestock and type of soil?
- What is your need? Are these resources enough to fulfill your need?
- How can the output from these be maximized, especially in the seasons of scarcity?
- Do integration of different subsystem help?

(2) Visioning exercise through discussion and drawing resource flow diagrams

**Stage 1 : Current Stage**

Say this is your current production system: you have one Rice Field (RF), which provides you with rice for household consumption, you sell some paddy in the market and your cow is getting some fodder from straw. You also get some milk for your children.

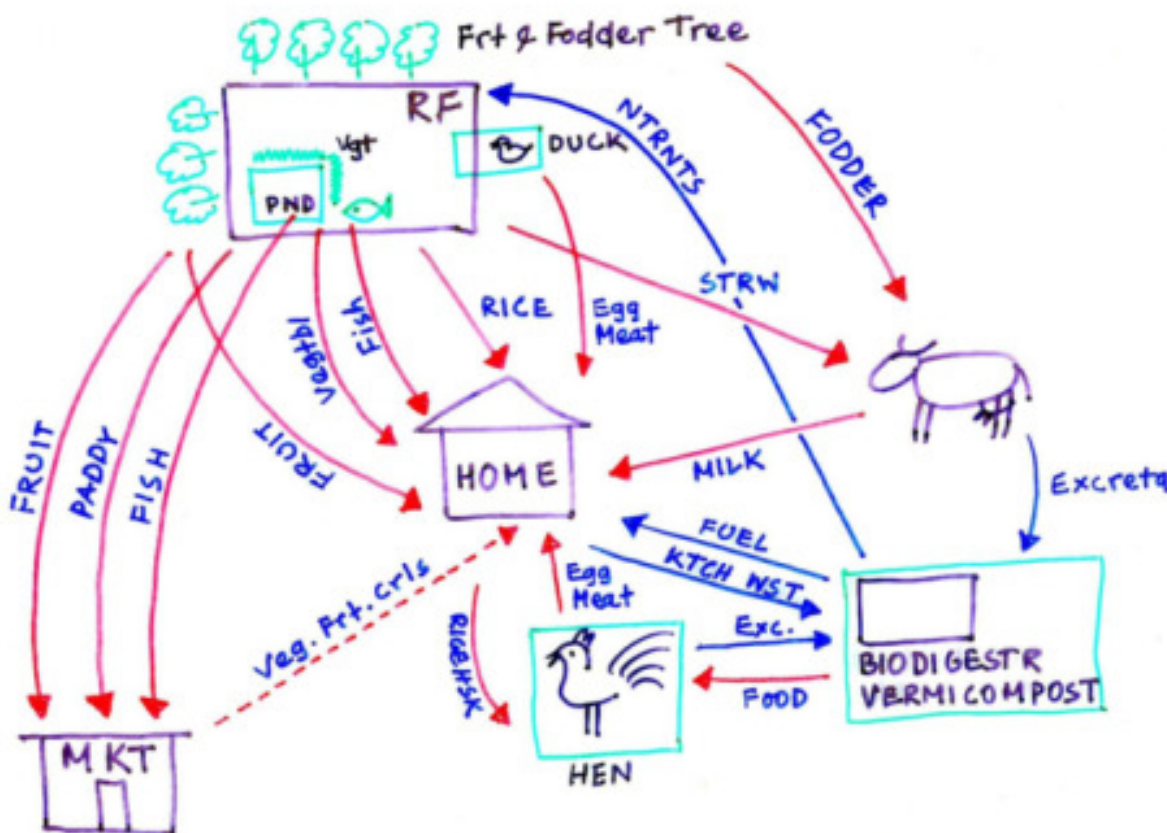


**Stage 2 : The future farm**

You want to make some simple changes. Like,

- Dig a small pond in the low lying area of your paddy field
- Raise the bund of that pond to cultivate vegetables
- Introduce fruit and fodder tree in the bund of the rice field
- Introduce fish and duck in the pond
- Introduce compost pit and poultry.

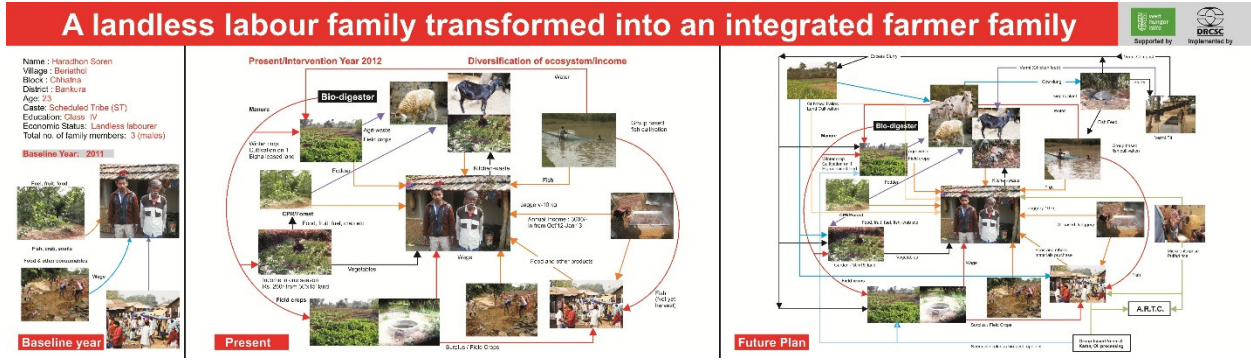
Now your production system is diversified and can support each other – which can reduce your cost and increase production and earning.



Can you design a similar type of production system for you according to your available resources?

**Key message:** We often do not use the full capacity of our resources.





**(3) Plan your action**

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*Farm Planning Matrix*

**Discussion points:**

- Consider your stress calendar, nutritional needs and available resource from the previous exercises. The row denotes summer, rainy season and winter. The column denotes farmland, homestead garden, wild collection, water body, poultry, livestock, orchard, food processing, and marketing. What do you want to do in each category of production in each season? Link it with your seasonal calendars, scarcity and resources.
- Discuss in the following way:
  - Farm land - soil health, water management, crops, trees
  - Garden - soil health, water management, crops, trees
  - Wild collection - soil health, water management, crops, trees in the commons to improve the harvest
  - Water body - fish, feed, crops on trellis, trees on bund
  - Poultry - feed, shelter, storage and use of waste product





- Livestock - feed, shelter, storage and use of waste product
- Orchard - soil health, water management, crops
- Processing - What are the things that can be processed?
- Marketing - What are the things that can be marketed?
- Do you want to start everything at one go? What is your priority?
- What is your capacity building need?

### Followup

We may repeat this exercise in each season with the same farmers, later on the time required will gradually decrease.

After the facilitator does this with one farmer in presence of the other farmers, each of the trainers has to do his/her own design and help others. It is expected that a group of 15 will complete the planning exercise in 5~6 days. The facilitator has to follow up and provide guidance during those days.

### Meeting 10: Planning Together

 Objective	Thinking about joint actions and possibilities for convergence as well as planning of skill building sessions and monthly meetings.
 Participants	Facilitator, farmer group(s) from one village
 Duration	3 hours
 Preparation	Bring the individual farm plan, seasonal calendars, transect, resource map, result of stakeholder analysis from the previous sessions



### Process

#### (1) Review of the planning process

The facilitator will praise the group members for completing the farm designs. Discuss the following:

- What did the group think about the planning process - What went well? What could have been improved?
- Will it fulfill the nutritional need, fodder requirement?
- Will you have work and income from the field during the stressed season?
- Are all of your resources and farm wastes fully utilized?

#### (2) Mapping input requirement

- When and how will the implementation start?
- What do you need to initiate the work?
- What is your entry activity?
- What is your input need? How can your input be mapped with the existing support system? Look into stakeholder mapping. What is the procedure of such convergence? The facilitator should note carefully and act as a liaison for convergence.
- Is there any common activity (seed bank, river lifting irrigation, soil water conservation, cultivation of fodder/pulses/oilseed on fallow land, plantation for creating orchard or forest, managing common lands etc.) we can take up? How can we converge this with existing effort by the others – refer stakeholder analysis.

#### (3) Future meetings

- Reflect on the capacity building needs identified during various sessions earlier
- Prepare a plan in a form of a training calendar for immediate capacity building needs for the coming season
- Set up an agenda for the monthly meetings, when all the group members will gather to discuss progress and plan of the next month

### 3.4 Phase 3 - Capacity Building, Implementation and Joint Monitoring

#### Step 5: Capacity building and implementation

**Objective of the step:** Farmers learn from the facilitators and/or each other about various skills required for establishing SIFS and apply them in their field.

**Content of the step:** 1. Crop/tree management (5 sessions) 2. Soil/water management (5 sessions) 3. Pest management (3 sessions) 4. Farm designs (2 sessions) 5. Livestock management (2 sessions) 6. Efficiency in energy (1 session) – Refer to Annex 1 for details.

**Methodology of the step:**



1. These capacity building sessions will be done in one resource farmer's place in rotation on 12~15 resource farms.
2. The suggested plan for such session is
 

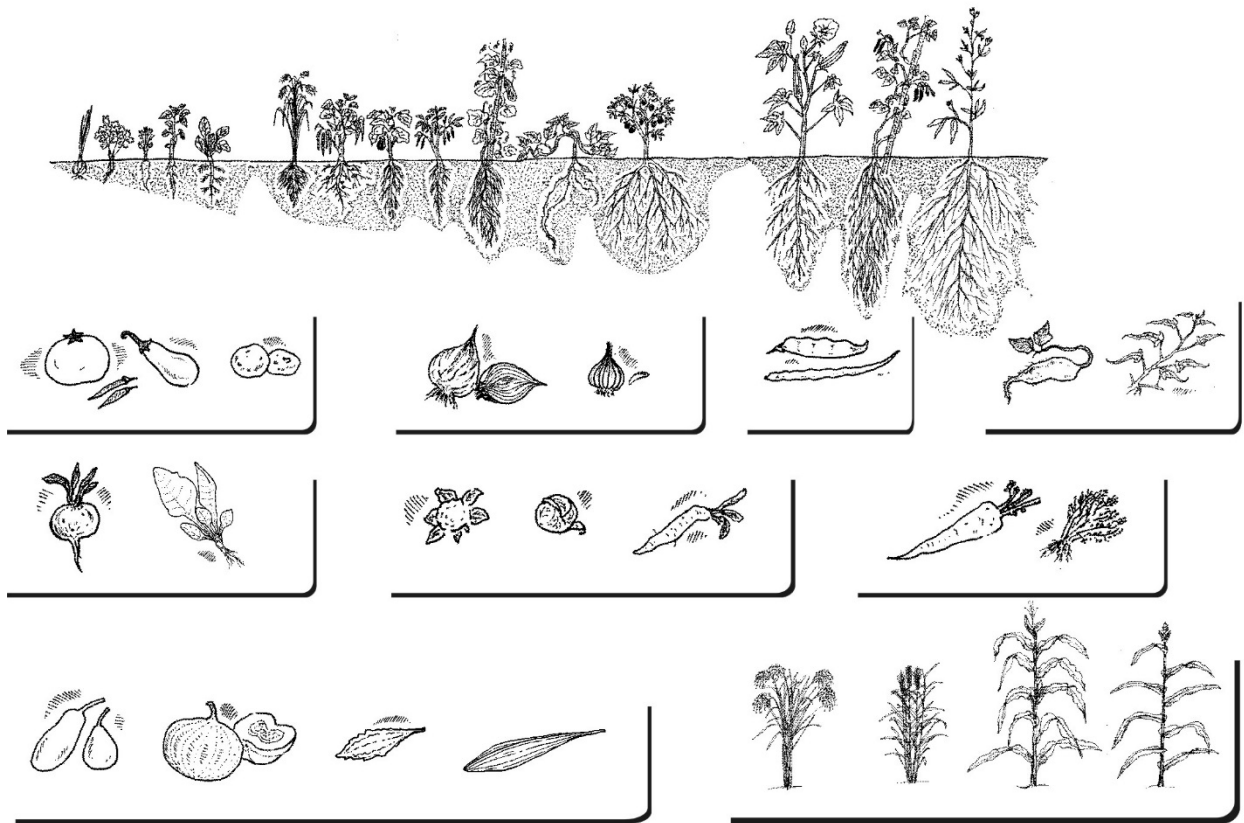
15 min	Last day's recap, discussion on home work
15 min	Explaining day's objective
15 min	Preparation for hands on work
120 min	Hands on work and/or experiment
10 min	Group games
20 min	Total break time given in between activities
15 min	Plan homework and the next day
10 min	Recap of the day
3. This can be spread to 6~8 months according to the availability of the farmers, seasonality and capacity building needs.
4. The farmer group will prepare their own training calendar, according to their needs and availability for the 18 PLA sessions. The sequencing of the sessions is also dependent on the farmer group.
5. All the topics introduced here are just for familiarization with skills and techniques to initiate SIFS. Further in-depth trainings might be required. These technique/methods are suggestive, there are number of other methods which can be followed.
6. In each of the sessions, the facilitator might select a local/external competent person to help with explaining the techniques.
7. There will be follow-up sessions in the larger group as an implementation action of the training by the RFs. The facilitators, initially, should be present to have the handholding.

#### Suggested sessions on technical capacity building

##### Crop/Tree Management

##### 1. Crops according to root depth/family

 Objective	To understand the various crop families.
 Preparation	Bring a few crops/plant in the locality



**Key messages**

- Tolerance limit of water scarcity increases with the root depth
- Crops from the same family should not be mixed together or repeated in consecutive seasons
- Crops of different root depth can be mixed together





*Mixing crops in humid region, Bangladesh*



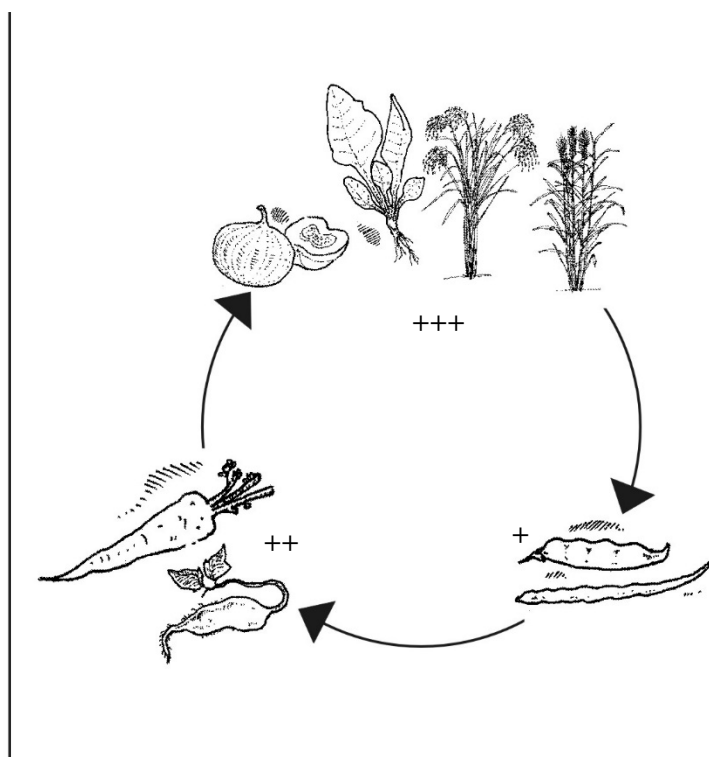
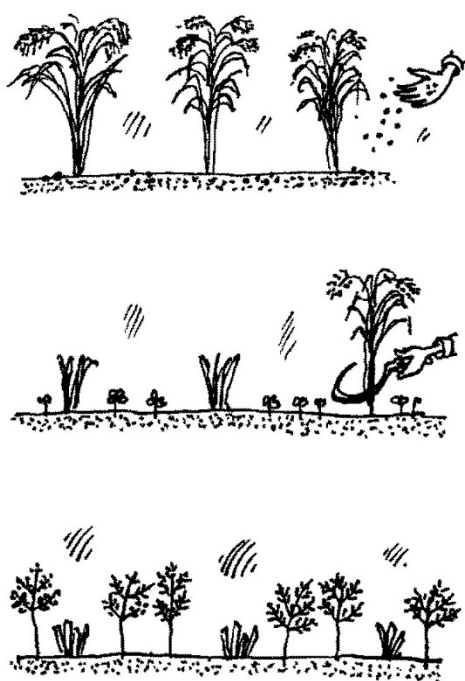
### Discussion points

- Why do you need mixed cropping?
- What are the common practices of mixing crops?
- What can be mixed with your current monocrops?
- Do we eat all these families of crops?

### 2. Relay Crops, Crop Rotation

 Objective	Know about relay crops and rotating crops.
 Preparation	It is best to do the handholding session of relay crops just before harvesting rice in a field. Crop rotation can be through group discussion.

### Process



### Relay crop

**Key message:** Before harvesting one crop, seed of other crops can be introduced which can be grown using the soil moisture (Example: chick pea/lentil/black gram etc. with rice)





*Realy crop of Lathyras after rice*

**Crop rotation**

**Key message:** Rotate crops according to its food requirement, it is always better to have one legume in a year. For example

- Season 1: Leafy/Fruit vegetable and grains (Food requirement : +++ )
- Season 2: Legumes (Food requirement : + )
- Season 3: Tubers, oilseeds, millets (Food requirement : ++ )

**3. How to mix crops in uplands**

 Objective	To learn how to mix crops in upland.
 Preparation	Handholding session in someone’s field

 **Process**



**Key messages:**

- Should mix crops from various families, food requirements, root depth and heights.
- There should be one legume and one cover crop in the combination.



- Major crop of the longer duration should be intercropped with shorter duration crops to increase soil fertility, mulching, get harvest at different time and better use of soil nutrient.
- For example the top figure shows Shorghum + Pigeon Pea + Sesame + Finger millet + Beans. The figure below shows Maize + Sesame + Black Gram

**Discussion point**

What is the ideal crop combination at your upland?





*Maize with beans and Roselle with Pigeon pea in dry area*

**Followup**

Resource farmers will do the similar session in his/her respective groups, the best time to do this exercise is before rainy season.

**4. Trees in need**


















 Objective	To identify and introduce trees in the production system.
 Preparation	Collect leaves, flowers and fruits of available big trees from the locality

 **Process**



*Leguminous trees on the bund, hilly area*





					
 Subabul	+++		+++		+++
 Besbani	+++	+++	+++		
 Subabul	+++		++		++
 Pongamia	++		+++		
 Drumstick	+++		+++		+++
 Gliricidia	+++	+++	+++		
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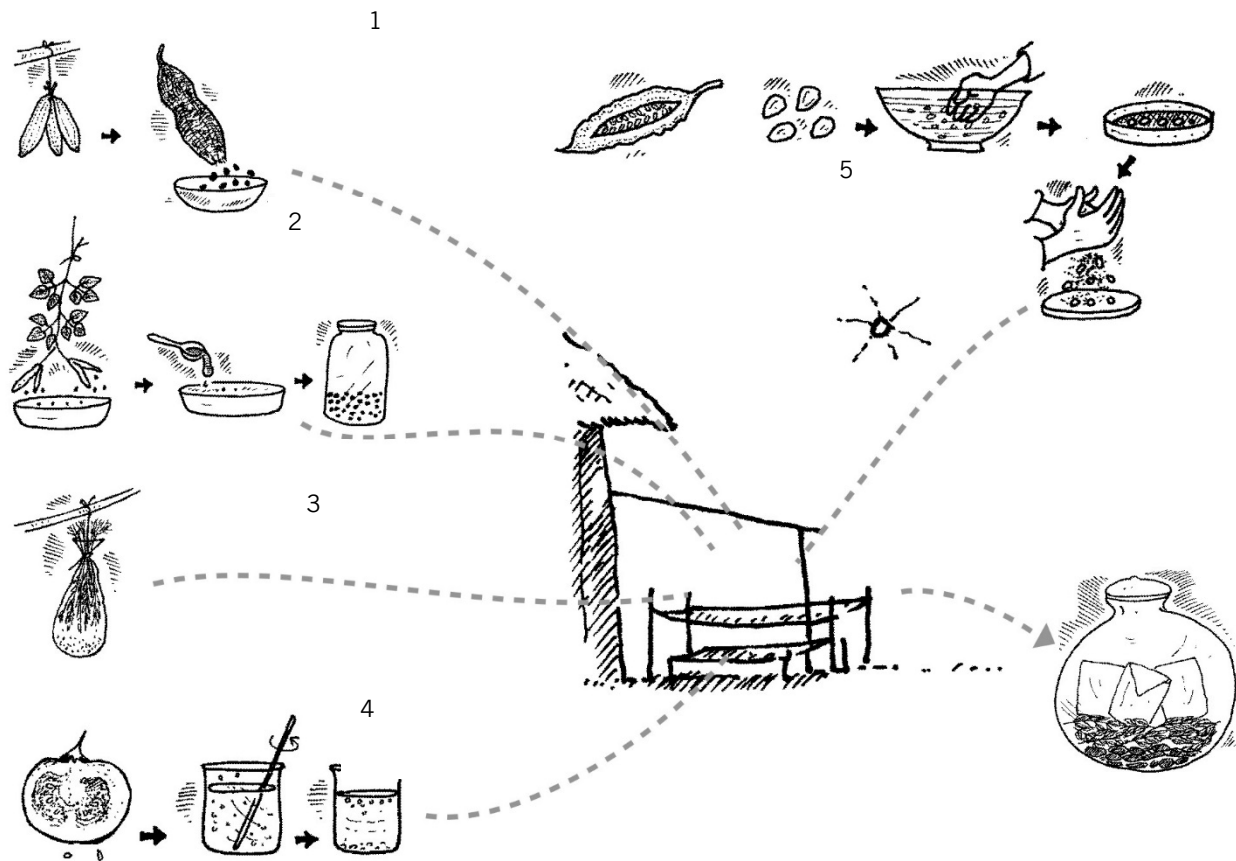
**Discussion points:**

- What are the other trees in the locality?
- How can we introduce more trees in our farm?
- Discussion with preparing list on the ground with gradation of +++ to ---according to criteria of usability as fodder, food, mulching/composting, from where you can cut to grow more branch and firewood. Actual leaves can be placed. The above table is an example.

**5. Seeds**

 Objective	To learn about seed preservation.
 Preparation	Fruits and different types

 Process



**Key messages**

- Seed should be collected from middle of the plant, in the midway of the fruiting season and from an average size of fruit.
- Keep the seed dry and always dry them in the shade
- Soaking overnight and drying in shade keeps your seed alive for longer (except legumes)



*Seed storage by farmeres, West Bengal, India*

### Discussion point

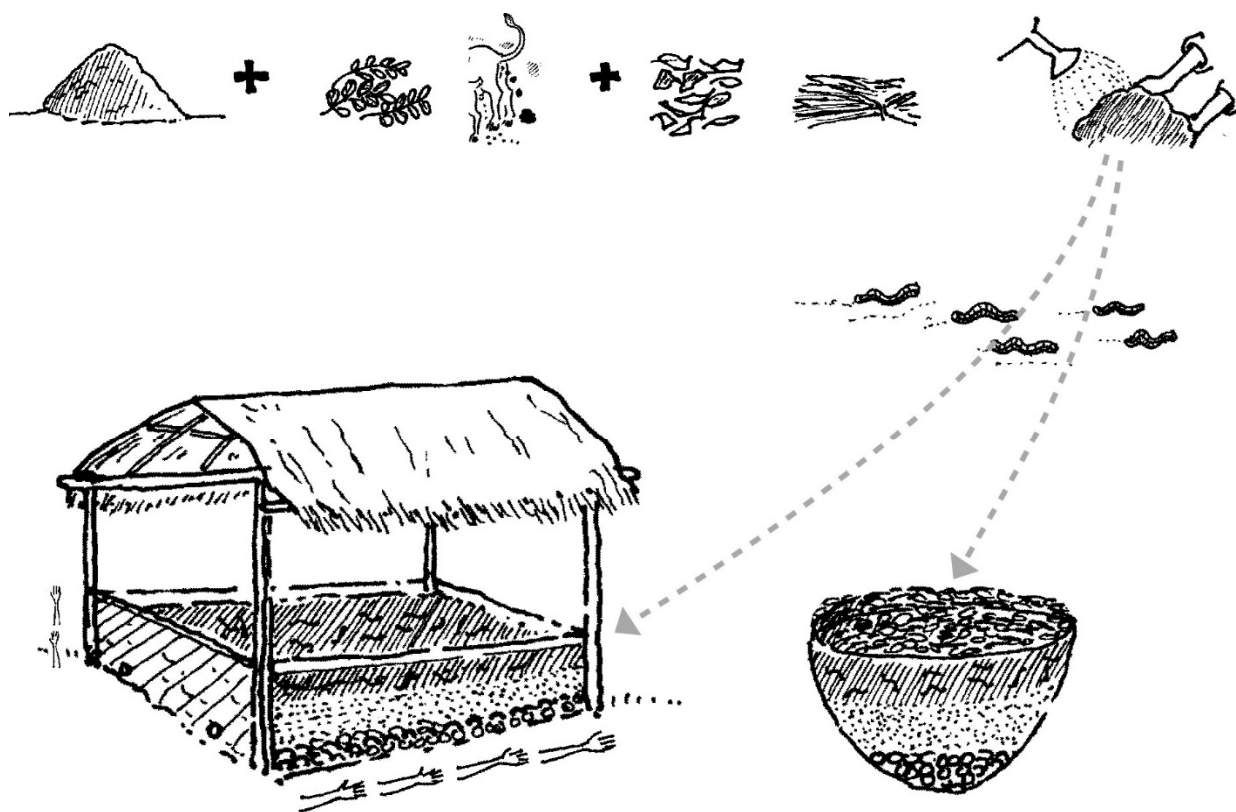
- Example here is 1. Ridged gourd, 2. Legumes (add a spoon full of neem oil), 3. Any leafy vegetables 4. Juicy fruits like tomato, 5. Bitter gourd/gourd family (rub it with ash)
- Are you keeping all the seeds that are required?
- What are others methods for seed preservation?

## Soil and Water Management

### 6. Vermicomposting

👉	Objective	To learn how to do vermicomposting.
✂️	Preparation	Prepare soil, green leaves, cow dung, dried leaves/straw in a 2:1:1:2 ratio, earth worms etc. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques of vermicomposting.

#### 🌀 Process





**Key messages:**

- 1 (soil) : 1 (Greens) : 1 (Cow dung) : 2 (dry matter) to be mixed and Vermies should be released in that half-decomposed matter after 3 weeks.
- 100 vermi/kg will prepare vermicompost in 30 days
- When prepared, vermicompost looks like tea dust and is without smell
- It is important to keep the mixture moist, for that cover the can with a moist gunny bag
- 5~6 ton/ha vermicompost is required for field crops

*A vermicompost unit with vermi-wash collection method and liquid manure, West Bengal, India*

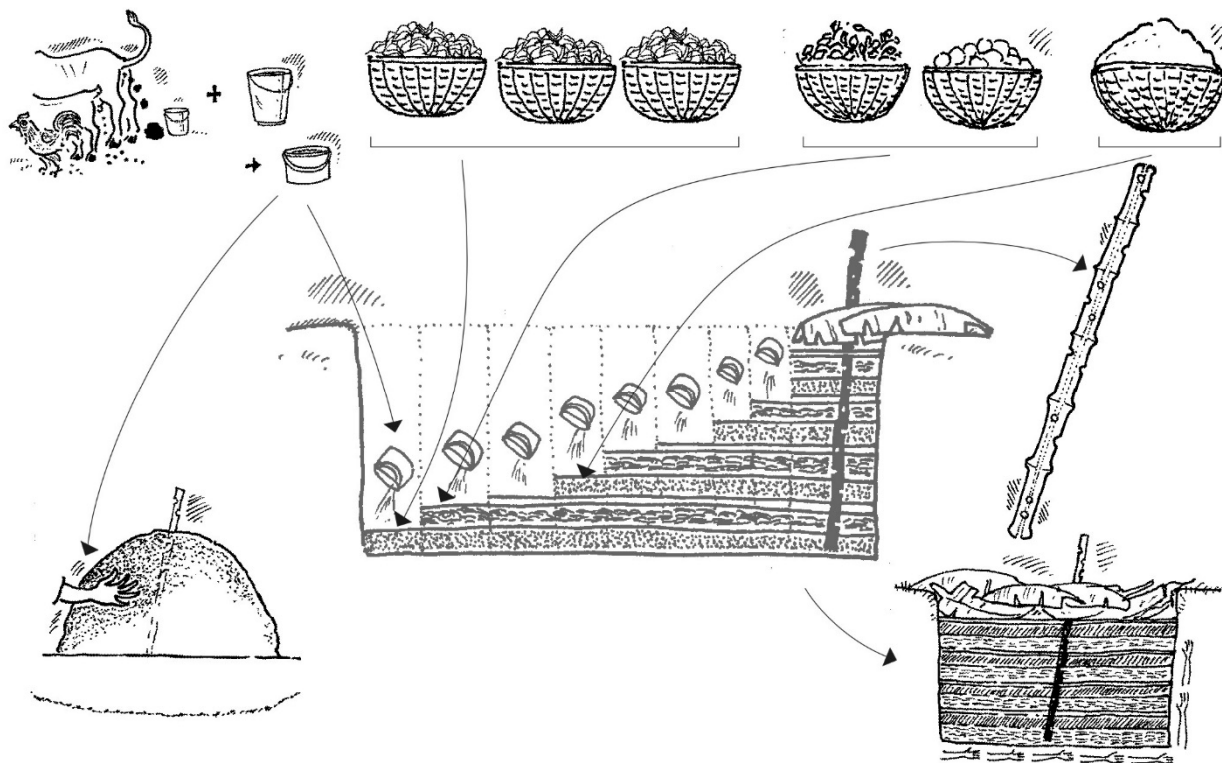
**To know more:** <http://www.indg.in/agriculture/on-and-off-farm-enterprises/Vermicomposting.pdf>

**7. Heap/Pit Compost**

✎ Objective	To learn how to compost.
✂ Preparation	Prepare soil, green leaves, cow dung, dried leaves/straw in a 1:1:1:3 ratio, cow dung/chicken faeces etc. mixed with water. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques of composting.



## Process



### Key messages:

- 3 (Dry matter) : 1 (Green) : 1 (Dung) : 1 (soil) to be put in layer with sprinkle of dung/sheet mixed with water. Should be kept covered. Bamboo/pole with holes in it to be placed to release the gas.
- It has to be turned over after 30 days, the moist condition has to be retained. The compost will be ready in 90 days.
- It can both be done in a pit or heap.





*Pit and heap composting in Jharkhand, India*

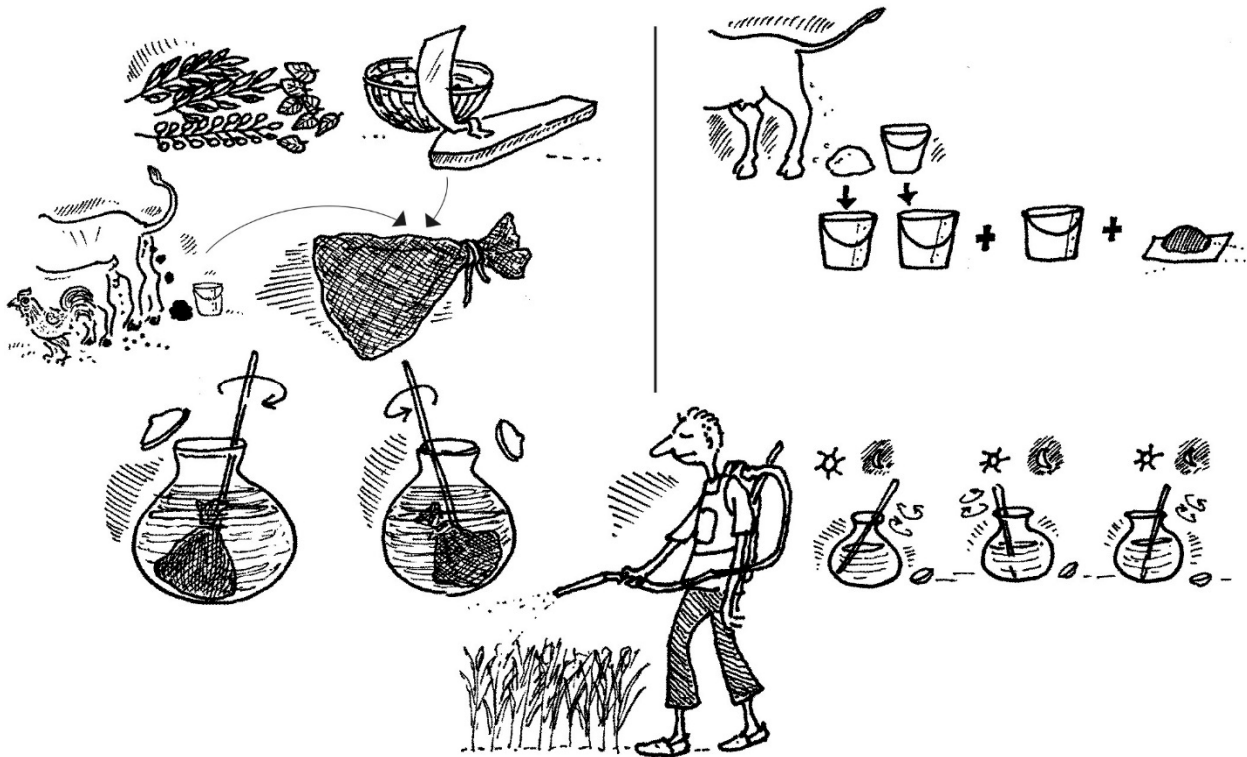
### To know more:

1. <http://deepgreenpermaculture.com/diy-instructions/hot-compost-composting-in-18-days/>
2. [http://www.fao.org/organicag/doc/on\\_farm\\_comp\\_methods.pdf](http://www.fao.org/organicag/doc/on_farm_comp_methods.pdf)

### 8. Liquid manure

 Objective	To learn how to prepare liquid manure and Amrit Pani.
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques of composting.

#### Process



*Liquid manure in India and Nepal*



### Liquid manure

#### Key message:



**Left Panel** - It needs 20 times water – and kept for 3~4 weeks, to be stirred twice clock wise and anti-clock wise.

#### Right Panel - Amrit pani

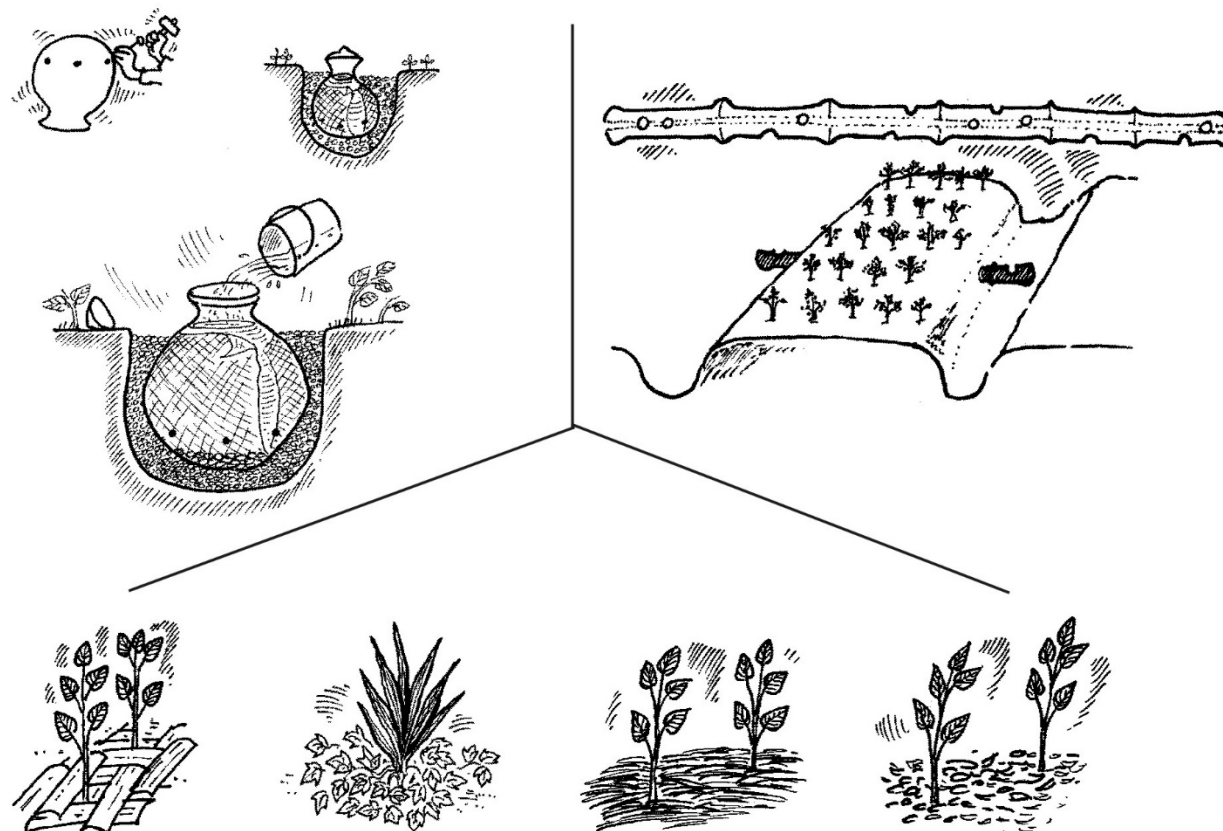
**Key message:** It needs 50gr jaggery to mix with and kept for 3 days. And mixed with 10l water before spraying.

**Discussion points:** What are the other methods of preparing manure? What is the pros and cons of all these methods?

## 9. Water management

 Objective	To learn how to do pitcher irrigation, drip irrigation and mulching.
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.

### Process



#### Key messages:

- Clock wise from top left Pitcher irrigation, Bamboo pipe drip irrigaton and mulching with banana stem, live mulching, straw or dry leaf and greem mulching.
- Irrigation water should be targeted and not exposed much.
- The soil should be covered by banana stems, dry/young leaves and even live cover crop like sweet potato to control evaporation loss.

**Discussion points:**



- Are we using water cautiously?
- Are there any other methods to use water cautiously?

**To Know more:** Restoring the soil : Roland Bunch

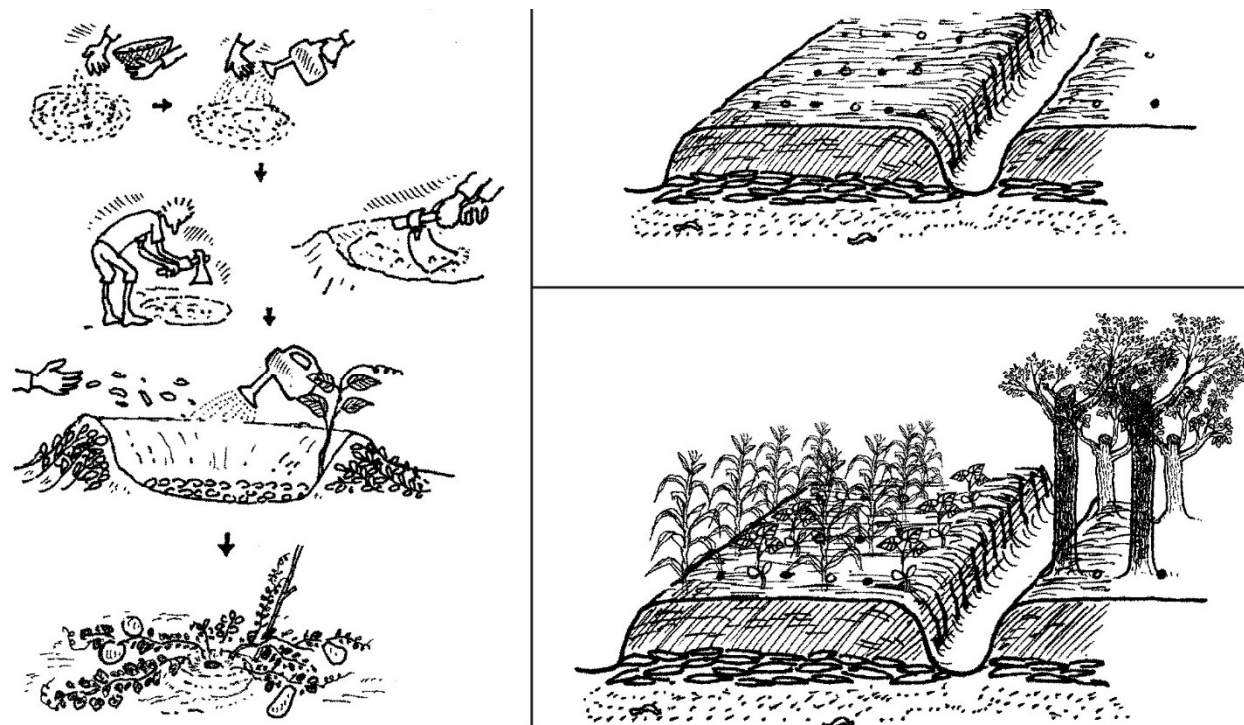


*Live mulching with sweet potato in Bangladesh and a household with multiple SW management with Azolla, vermicompost and liquid manure in Jharkhand, India*

**10. Bed for Water Management**

 Objective	To learn how to prepare a circle bed, double digging bed and bed for upland
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.

 **Process**





**Key message:** Beds are used for optimal utilisation of water and nutrient. Clock wise from left circle bed, double digging bed and bed system for alley cropping.



**Discussion point:** Do you know other methods to prepare beds?



*Plastic pond in Nepal*

## Pest and Disease Management

### 11. How to use Neem

	Objective	To learn how to use neem as a pest repellent.
	Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.



 Process



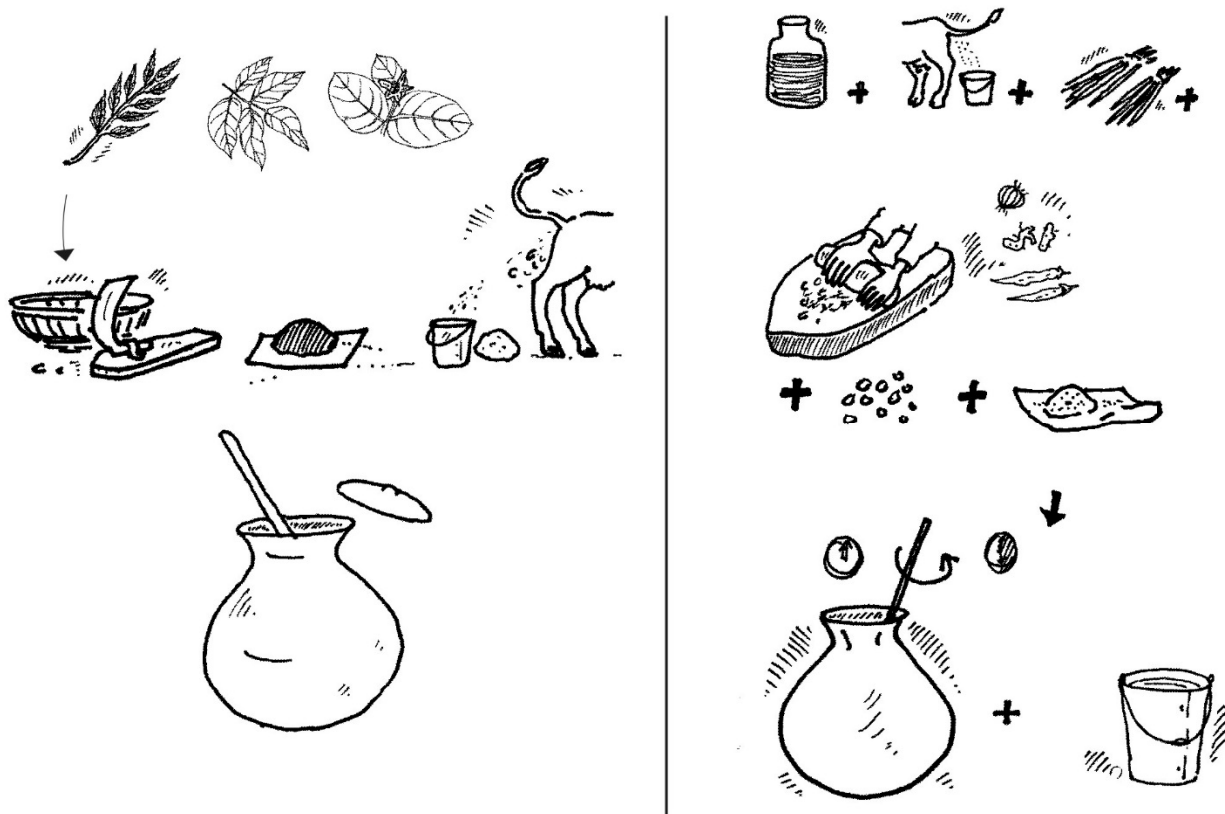
**Discussion points:**

- (1) Neem seed can be dried, pounded and mixed with water(50 gr/l)
  - (2) Oil extraction is also possible from neem seed and 30ml oil + 1ml soap/l water can be mixed to spray.
  - (3) Overnight soaked neem leaf water also can be sprayed.
  - (4) Layer of dried neem leaves with stored crop and mud plaster with dried neem leaves for keeping seed/crops safe.
- Do you know any other method to use of neem?
  - Do we have enough neem tree in the village?
  - What are other leaves/fruits that are available which can be used as pest/disease manager?

**12. Organic Pest Repellents**

 Objective	To prepare organic pest repellent.
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.

 Process







**Discussion Point:**

Left: Leaf of neem, karanj and akwand in a 1:1:1 ratio; cut finely and mixed with cow dung, urine and jaggary.

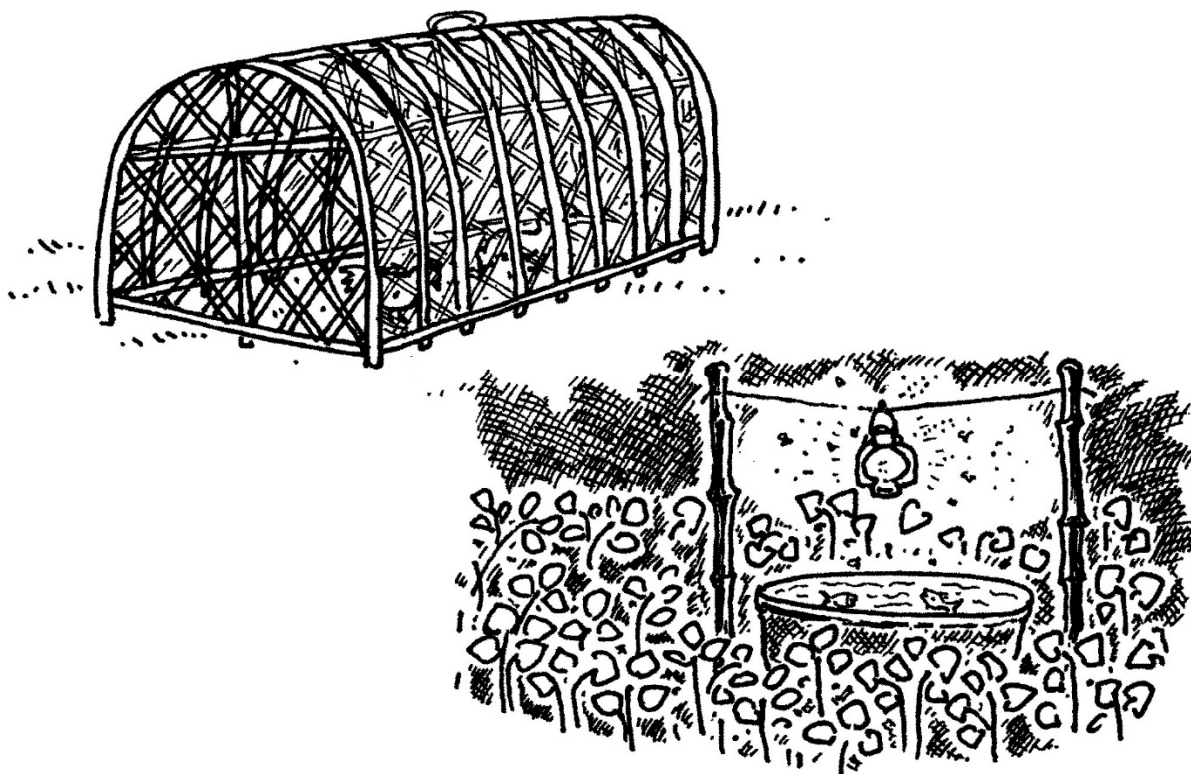
Right: Use 0.5l neem oil, 3l cow urine, 100gr asafetida, 50gr soap, 500gr ginger, 250gr garlic, 250gr chili pest and 250gr tobacco leaf; it has to be tightly closed for 10 days, needs be stirred in each 3 days. 1l solution to be mixed with 100l water for 1 ha of land.

What other methods of biopest repellents you know?

**13. Use animal behavior to keep away pest**

 Objective	Know about chicken sheds and light traps with fish
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.
 Process	
 Follow up	Facilitator should note the learning to share with others The resource farmers should do a similar session in his/her group

 Process



**Chicken Shed**

**Key message:** After harvest, if you allow your chicken onto the field in a cage, the chicken can eat up seeds of weeds and pests. They will also fertilise the area.



**Fish**

**Key message:** Set a light trap in your crop field/garden and raise local carnivore fish below that.

**Discussion point:** Can we take advantage of the behaviour of any other livestock?

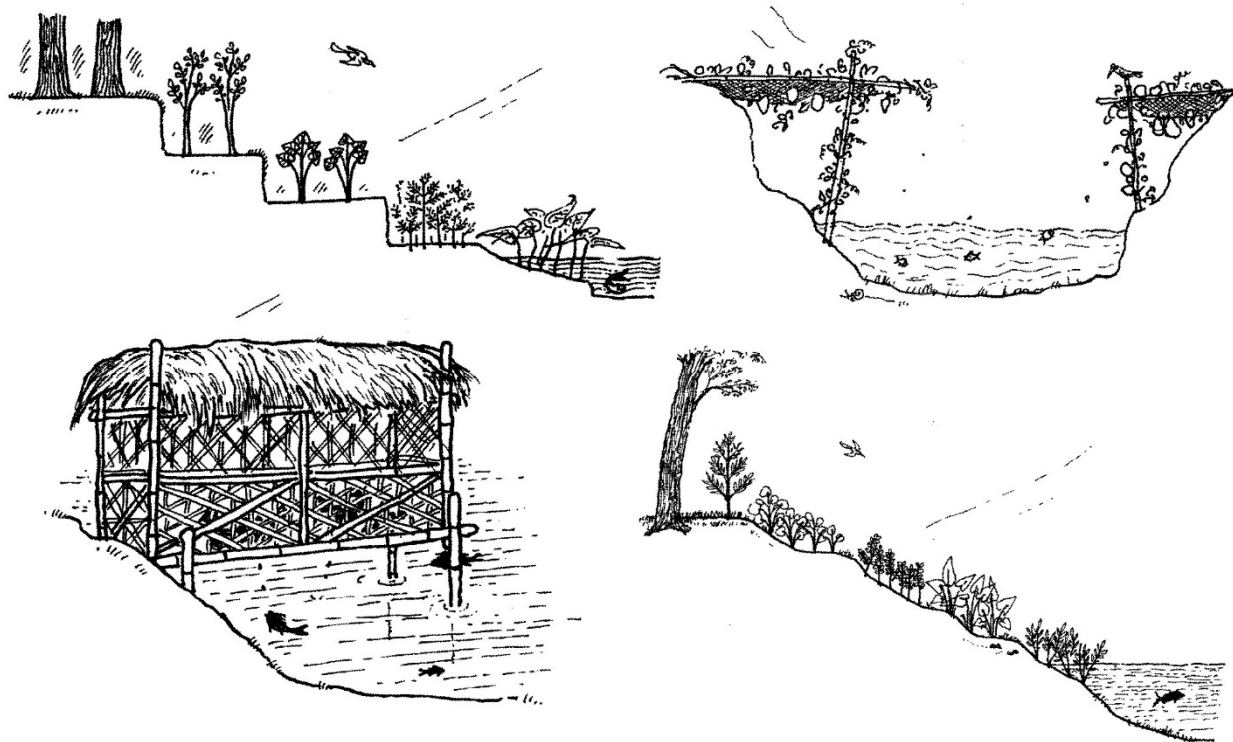
**Multilayer Designs**

**14. Designs around Pond**

 Objective	To understand how a pond can be used for multiple purposes
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.



 Process



**Key messages:**

- When the water recedes, the moisture and waste from the ducks and fish will make the pond bank fertile for plants
- We can create structure to allow creepers or chicken coup over the pond, so that nutrients are recycled





*Hen cage over pond and use of pond bank*

**Discussion points:**

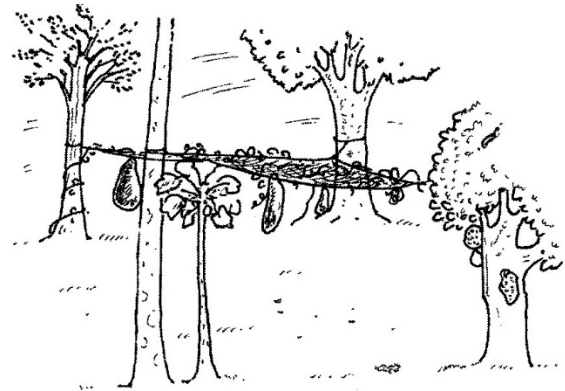
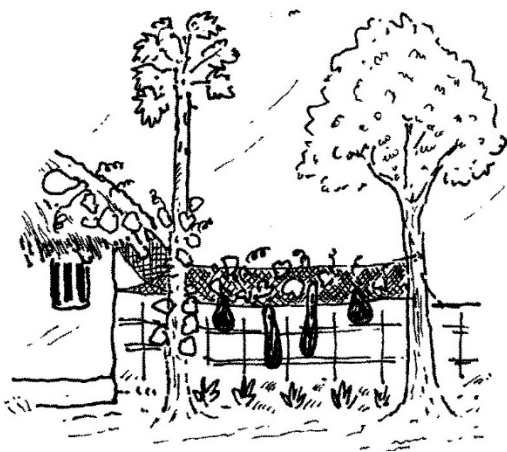
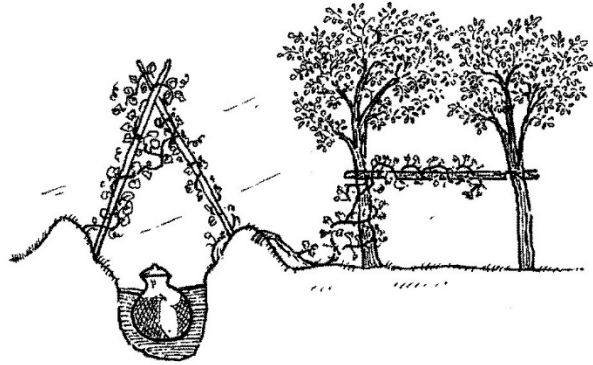
- Are we using pond to its fullest possibility?
- What can be done at your pond? What crops trees can be introduced?

**15. Multilayer Design**

 Objective	To understand the principles of multilayered design
-----------------------------------------------------------------------------------------------	-----------------------------------------------------

 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.
-----------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

 Process



**Key messages:**

- Trees can be the most important component of your production system.
- Multilayer structures can multiply your space and improve the use of nutrients.



*Live fence, channel on the rice field and use of dyke,*







*Multiple diversity, multilayer garden using wastewater from tap*

**Discussion point:** Do you have any unutilised empty space? Can you use that?

**To know more:** Farm Designs, BIOFARM booklet series, DRCSC

## Livestock Management

### 16. Livestock Shelter

 Objective	To understand the importance good management of livestock shelters.
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.

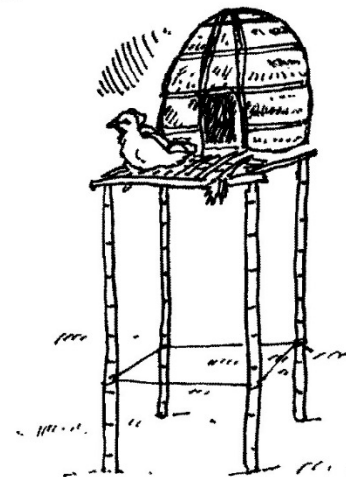
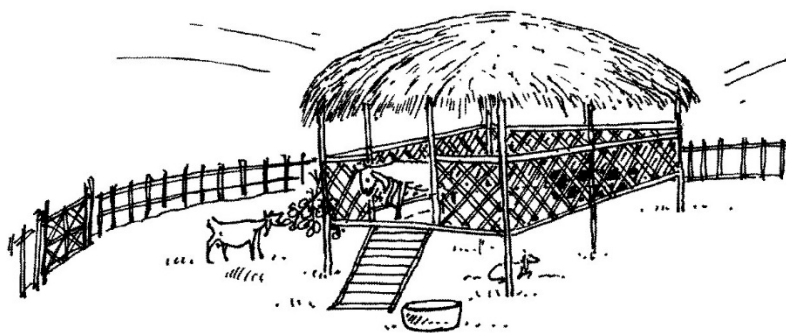
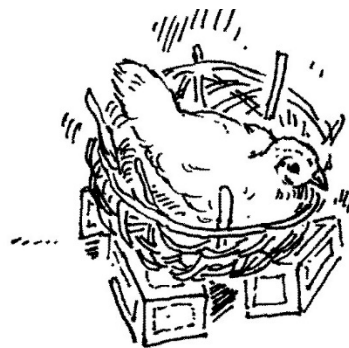
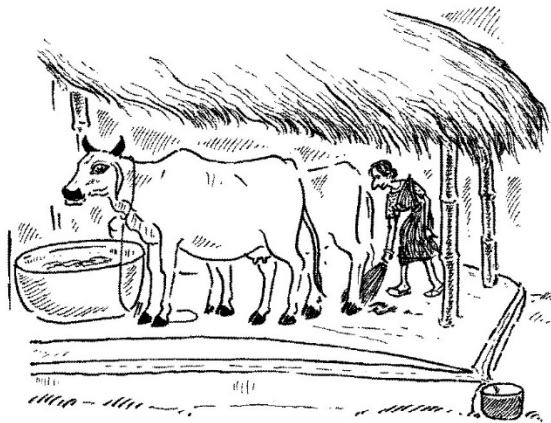
#### Process

##### **Key messages:**

- The floor should be dry sloppy but not uneven. The urine and dung are to be collected regularly for agricultural purposes.
- The shed is to be cleaned and disinfected by sprinkling a dilute solution of lime/turmeric water and fumigated with neem, karanj and eucalyptus leaf.



##### **Discussion points:**

- Are we giving enough care to our livestock?
- Are we growing fodder for them? How can we reduce buying fodder from outside?





















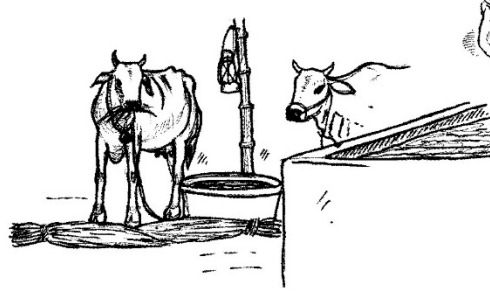
*Improved cowshed and goatery unit in Nepal*


## 17. Fodder

 Objective	To learn different methods of preparing fodder.
 Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.

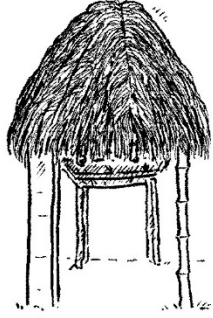
 Process

			 6 %	
			 4 %	
			 5-8 %	
			 5-8 %	







How to make feed concentrate:  
 Rice/Wheat/Shorghum/Millet – 40 + Bran  
 – 32 + Oil cake – 25 +  
 Salt/Minerales/eggshells – 3 = 100



**Key messages:**

- Water storage in the route of the livestock should be in place, especially for the summer season.
- Any dry stem of rice/millet etc. can be fed to animals – provided kept safely and without moisture.

**18. Energy**

	Objective	To learn different methods to conserve fuel and increase energy efficiency.
	Preparation	Materials as needed for the processes described below. The session will be done in one farmer's place. The session has to be facilitated by someone who knows the techniques.





*Photo source: Internet*

**Discussion points:**

- Refer to our seasonal calendar exercises in the planning stage, look for fuel scare seasons. Review fuel storage methodologies. Discuss on how to keep things dry.
- Refer to our session on tree. Which are the trees which are good as fuel? “Good” is here defined as smaller quantity needed to produce more heat or burns for longer. Do we have enough such plants? Can we raise them in common land?
- How to get subsidies for making bio gas?
- How to make smokeless ovens?
- What are the energy saving cooking methods?
- How to keep food warm in winter?





Biogas, West Bengal, India

For more technical input see:

1. Taylor, P. and Beniast, J. 2003. **Training in agroforestry: A toolkit for trainers**. Available online at [www.worldagroforestrycentre.org](http://www.worldagroforestrycentre.org)
2. Neef; Andreas (ed.) (2005): **Participatory approaches for sustainable land use in Southeast Asia**. A realistic assessment of the potential and limitations of participatory research and development in Southeast Asia. White Lotus Ltd., Bangkok. (University Hohenheim, Heidhues )  
[http://www.google.com.np/url?q=http://www.researchgate.net/publication/236611662\\_Participatory\\_Approaches\\_to\\_Research\\_and\\_Development\\_in\\_the\\_Southeast\\_Asian\\_Uplands\\_Potential\\_and\\_Challenges/file/60b7d518424d912056.pdf&sa=U&ei=Efo\\_UdfoHIXPrQfH5YCwBA&ved=0CB4QFjAC&usg=AFQjCNHGbegVsaGaPyxRzdOJddHyQH5iqQ](http://www.google.com.np/url?q=http://www.researchgate.net/publication/236611662_Participatory_Approaches_to_Research_and_Development_in_the_Southeast_Asian_Uplands_Potential_and_Challenges/file/60b7d518424d912056.pdf&sa=U&ei=Efo_UdfoHIXPrQfH5YCwBA&ved=0CB4QFjAC&usg=AFQjCNHGbegVsaGaPyxRzdOJddHyQH5iqQ)
3. Manual on IFS : CARDI
4. <http://www.kstoolkit.org/What+is+Your+Context%3F>
5. [http://www.fao.org/corp/google\\_result/en/?cx=018170620143701104933%3Aqq82jsfba7w&q=manual&cof=FORID%3A9&x=0&y=0](http://www.fao.org/corp/google_result/en/?cx=018170620143701104933%3Aqq82jsfba7w&q=manual&cof=FORID%3A9&x=0&y=0)

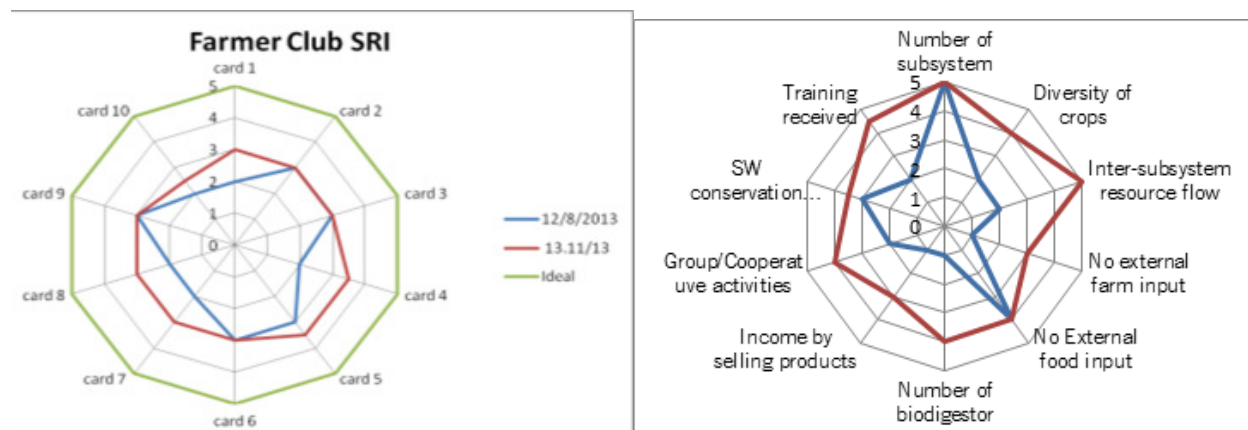
## Step 6: Joint monitoring

**Objective of the step:** Farmer group will learn to monitor/track the progress of their activity and take measures to modify plans.

**Content of the step:** Community monitoring tool (web/wheel diagram).

**Methodology of the step:**





1. There are 10 cards in a set of cards with following criteria.
2. The farmers need to give 0 to 5 according to their understanding of the progress. It is encouraged that farmers do this exercise on their own. The criteria is given below, which also can be redefined by the group.
3. The facilitator need not calculate exactly the %, it is on the basis of discussion. The discussion should be done sitting in a group, so that you can validate from other fellow farmers. This can be done for a single farmer or for a group of farmers in general. The points given here in each parameter is just an indication on how to quantify. You can use stones to give points in each parameter.
4. This can be used as a community monitoring tool as a baseline, midline, endline. The parameters have been selected keeping the SIFS project indicators in mind. This should ideally be practiced before and after the main cropping season.
5. However, for our purpose we can draw this to understand the progress. The blue line is for when we did it for baseline, red is for endline. More symmetry means you performed better in all the aspect. As it is visual, you can use it anywhere.
6. The entire process should take 3 hours. (Refer Annex for further details.)



*Plotting result of group and individual monitoring*



### Step 7: Monthly meetings

 Objective	Reflection on (a) the capacity building sessions, last month's planning and actual implementation of the learnings and (b) the status of the convergence applications and follow up.
 Participants	Facilitator, farmer group(s) from one village
 Duration	2 hours
 Preparation	Plan for a farm visit during the meeting

### Process

(1) Review of the capacity building session

#### Discussion points:

- What did the group think about the last month's capacity building process - What went well? What could have been improved?
- How many applied the learnings in their own field?
- What were the difficulties?
- Topic, venue and necessary preparation for this month's sessions.

(2) What is the status of joint action and convergence applications?

(3) Farm visit and reflection on the planning process vis-à-vis field implementation.

(4) Any other emerging issue.

### Annex 1: Grading methods of community monitoring tool

**Indicator**

**Suggested Marking Criteria**



**Group/cooperative activities:** To which extents farmer is active in group, cluster group, common activities and joint action like farming in common land etc

Member of the cooperative/cluster group	5
Active in the common activities	4
Taking initiative in the group and has a leadership quality	3
A group member and regular in the group	2
A group member	1
Not a group member	0



**Soil Water conservation methods adopted:** How SW conservation are integrated in the farm, options are: field bunds, rainwater harvesting, mulching, using compost, semi-circular bund, zero tillage farming, diamond bed, double digging bed, pitcher irrigation, circle bed etc.

No shortage of irrigation water (surface water)	5
Shortage of 1 month	4
Shortage of 2 months	3
Shortage of 3 months	2
Shortage of 4 months	1
Shortage of 5 months or more	0

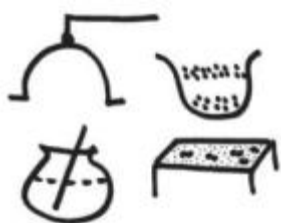


**Number of Subsystems:** Here the number of subsystems (Biodigester, Poultry, Livestock, Tree, Crop, Aquaculture) possessed by the farm are indicated.



**The Inter Sub system Resource flow:** The number of linkages (that indicates the integration) between the different subsystems present.

More than 10 links	5
8~9 links	4
5~7 links	3
3~4 links	2
1~2 links	1
No link	0

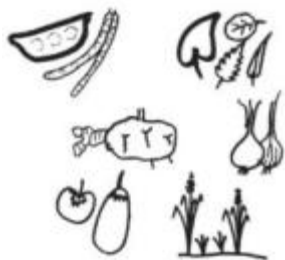


**Number of biodigester:** Ranking of the biodigester should be done as follows:

Options are: Biogas Plant, Vermicompost Pit, Compost Pit, Liquid Manure, Farm Yard Manure, green manure etc

All 5	5
Any 4	4
Any 3	3
Any 2	2
Any 1	1
None	0





**Diversity of crop and cropping techniques:** A farm should be graded by the diversified crop elements present. Crops may include fruit type, leguminous, leafy vegetables, cereals, medicinal herb, tuber crop, spices etc. Cropping techniques include mixed cropping, intercropping, crop rotation, relay cropping etc. The ranking will be as follows:

VERY HIGH-	5
HIGH-	4
FAIR-	3
LOW-	2
VERY LOW-	1



**Training received:** SIFS is about multiple skills, we have adopted a yearlong training approach with FFS. The skills are broadly: 1) Analysing stress, livelihood cycles, resources, capacities and planning the own farm model based on that. 2) Various soil nutrient management methods 3) Water management methods 4) Horticultural component in the homestead and field 5) Backyard poultry management including feed 6) Small livestock management including fodder 7) Paste/ disease management of crops/livestock throughout the growth stages 8) Soft skills on group development and value chain

Can train up other farmers as a resource farmer	5
Taken all the training components	4
Taken 6 of that	3
Taken 5 of that	2
Taken 4 of that	1
Taken less than 4	0



**No external food input:** The external food inputs (think of vegetables, protein – everything that needs for a balanced diet) bought from the market should be calculated as percentage and the ranking may be done as follows:

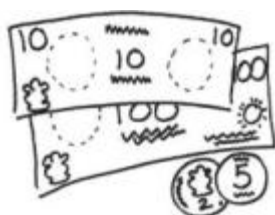
No food inputs bought from the market	5
Up to 25% bought from the market	4
Up to 50% bought from the market	3
Up to 75% bought from the market	2
Up to 90% bought from the market	1
All the food inputs are bought.	0





**No external farm input:** The external farm inputs (including seed) bought from the market should be calculated as percentage and the ranking may be done as follows:

- No farm inputs bought from the market 5
- Up to 25% bought from the market 4
- Up to 50% bought from the market 3
- Up to 75% bought from the market 2
- Up to 90% bought from the market 1
- All the farm inputs are bought. 0



**Income by selling product:** Please do not consider distress selling, we can also take it like 'how far cash need is met from market linkage income'. Ranking can be done as follows

- 60% of the cash income comes by selling products 5
- Up to 40% from selling products 4
- Up to 30% from selling products 3
- Up to 20% from selling products 2
- Up to 10% from selling products 1
- None from selling products 0

### Annex 2: Process Documentation




**Objective:** To document, understand and share the agronomy and economics of the farm with others as a learning process, especially recommended for the resource farmers who can share this with others.




**Methodology:** Farmers need to keep regular diary. For some selected farmers, data may be put in to an input-output analysis database for further analysis. Case study on farm/farmer/techniques to be prepared from time to time.

#### Diary Format

Date	Activity and how much time s/he invested in the farm/livestock/pond	Input (seed, fertilizer, fodder etc. – giving the amount in kg or money and mentioning the source)	Output (whatever s/he got out of the process – mentioning the amount in kg or money and mentioning the use)	Observation (pest attack, any new thing etc. and what s/he did for that)

### Annex 3: Diet Diversity Score – Monitoring by the Facilitator

	Objective	To monitor the changes in the diet pattern of a SIFS family.
	Participants &	<ul style="list-style-type: none"> <li>▪ This will be done by the facilitators 3 times a year with some selected representative family and also with some families at random.</li> <li>▪ It is better to do it with the entire family, especially in presence of the women members</li> </ul>
	Duration	

 Preparation	<ul style="list-style-type: none"> <li>▪ The nutritionist needs to identify important available food groups and put them into the rows of the following table (example)</li> </ul> <table border="1" data-bbox="464 268 1380 743"> <thead> <tr> <th></th> <th>Today</th> <th>Yesterday</th> <th>Day before</th> <th>Day before</th> <th>Day before</th> <th>Day before</th> <th>Day before</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>Leafy vegetables</td> <td>1</td> <td>1</td> <td>1</td> <td></td> <td>1</td> <td>1</td> <td>1</td> <td>6</td> </tr> <tr> <td>Vegetables</td> <td>1</td> <td></td> <td>1</td> <td></td> <td>1</td> <td>1</td> <td>1</td> <td>5</td> </tr> <tr> <td>Potato/Tuber</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>7</td> </tr> <tr> <td>Collected food</td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td>Milk</td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td>Meat/Fish</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0</td> </tr> <tr> <td>Egg</td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td>1</td> </tr> <tr> <td>Oil</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>7</td> </tr> <tr> <td>Sugar/Jaggery</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>7</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>▪ When recalling whether they have this food group, put 1 if yes. The total frequency of that group = total number of 1</li> <li>▪ The diet diversity of the family = total of frequency/number of food groups. Here it is <math>35/9=3.8</math></li> <li>▪ The maximum score can be 7.</li> </ul>		Today	Yesterday	Day before	Day before	Day before	Day before	Day before	Frequency	Leafy vegetables	1	1	1		1	1	1	6	Vegetables	1		1		1	1	1	5	Potato/Tuber	1	1	1	1	1	1	1	7	Collected food				1				1	Milk			1					1	Meat/Fish								0	Egg				1				1	Oil	1	1	1	1	1	1	1	7	Sugar/Jaggery	1	1	1	1	1	1	1	7
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Sugar/Jaggery	1	1	1	1	1	1	1	7																																																																																			
 Process	<p>The tool is just to initiate discussions, the key questions that we should ask are:</p> <ul style="list-style-type: none"> <li>▪ What is the amount of each food group? Is that enough for each member?</li> <li>▪ What is the source? How much are you producing? Has that increased from the last time?</li> <li>▪ How do you cook? How many times you cook? How you keep your cooked food?</li> <li>▪ Who eats first? What is the menu of the women?</li> <li>▪ Is there any special treatment for the men?</li> <li>▪ Is there any specific food for the infants and young kids?</li> </ul>																																																																																										
 Follow up	<p>Facilitator will repeat the process in every 6 months and discuss the consequences.</p> <p><b>For more information about the diet diversity score see:</b>  <a href="http://www.fao.org/fileadmin/user_upload/wa_workshop/docs/FAO-guidelines-dietary-diversity2011.pdf">http://www.fao.org/fileadmin/user_upload/wa_workshop/docs/FAO-guidelines-dietary-diversity2011.pdf</a></p>																																																																																										



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