

# Guidelines for SOFT Facilitators

Developing approaches to enhance farmer water management skills in Balochistan, Punjab and Sindh in Pakistan.



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## Background

Technologies and tools exist in Pakistan for water and irrigation management and others, from Australia are also being utilised but **it is the farmer skills and knowledge of water and irrigation that must be improved**. A collaborative designing approach, with a **focus on training some farmers in adult learning skills and techniques, will achieve scale-out of water technologies and tools**.

Tools represent a mechanical/technological means of measuring/observing levels of moisture and nutrients, and they may give confidence to farmers' existing skills in observation and interventions. Models are neither better nor worse because of tools. The functions that the tools provide will be of keen interest in the various models.

So, it is that the **learning models are of prime importance** in achieving sustainable practices for water and irrigation management. As well as facilitating farmers in learning about irrigation and water management **it is vital that they learn about the ways in which they are learning** so that they can in turn teach others. This can be achieved both by your example and the way you facilitate the sessions but also by explaining to farmers how and why you are working with them in these ways.

**Using these models is important** because both VM and CPS **involve the farmer and other stakeholders actively and as equal participants**. It is not the top down curriculum you are used to in FFS it is going to be a **learning program designed by the farmers and other stakeholders** to meet the needs

they have and address the issues they identify **when the time is right. SO, YOUR NEED TO BE FLEXIBLE AND WILLING TO BE LED BY THE FARMERS – people learn best when they need to know** – this is called “just in time learning”.

Let me give you an example, you go to training program to use excel spread sheets, but you do not need to use them in your research or your work for another six months – so you forget what you learned. BUT if you had done the training the week before you need to use it – “just in time” you would remember and adapt to it quickly.

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Some of the techniques you have used in FFS can be applied within the models, but it is important that you follow the steps in the models and avoid falling back into the FFS way.

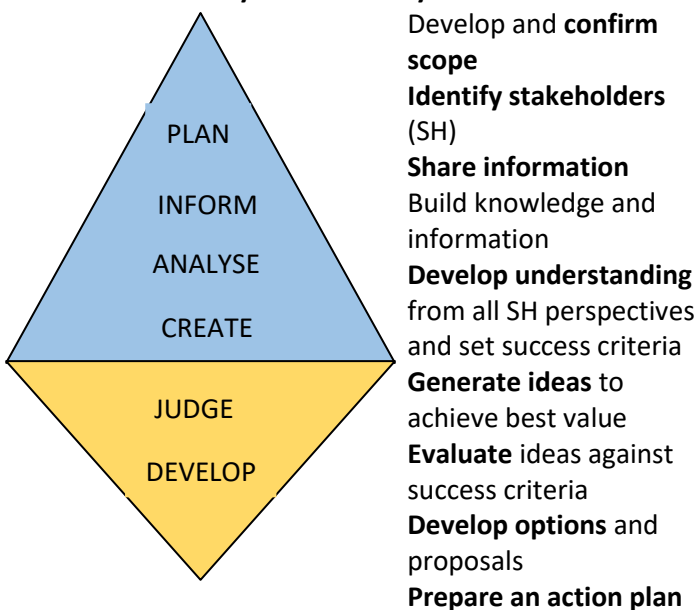
Throughout the project so far, we have been using three models which are summarised below and we have had some success with all three. We have however, also realised that there have been some challenges and so after some research with facilitators and much discussion we are moving to a modified approach which for the time being we will call Farmer Integrated Learning Model (FILM). To ensure we have a grasp on what we have been doing the following summary of the three models so far trialled needs to be revisited before going on.

### **Summary of theory about Models** so far trialled in current project

As SOFT facilitators, you were working with Model 1 and 2 and the PCRWR staff were involved with Model 3.

**MODEL 1 – Value Management:** This is a formal, highly analytical, standards-based and Australian government endorsed value-focused approach called Value Management (VM) which meets the Australian Value Management Standard (AS4183-2007). Model 1 relies heavily on expert facilitation, rigorous problem identification and delineation of key issues and concerns, followed by equally rigorous function analysis and costings to further open the problem and key issues, thus identifying creative solution approaches.

### VM is a structured systematic analysis



The VM approach calls for the client and end users to receive, from their investment of time and other resources, the levels of performance and quality required, at the lowest total

optimum whole-of-life cost. The **concept of value is not equated with cost or money**, which results in facilitating exploration of the value for the various stakeholders.



Training sessions of men and women farmers under VM model

Stakeholders have different values and expectations. Typical end users in the project are the farmers who require fit for purpose, ease of operation and maintenance of new approaches as well as consultation during planning, implementation and evaluation phases. Community groups require due consideration of their concerns through consultation and participation, especially in projects that affect the community. Scientists and other professionals require a clear brief and a process to target the minimisation or elimination of work. The global community requires ecological sustainability as a primary consideration.

It is anticipated that action plans and solutions will be cost-effective and sustainable, as farmers will learn with, and from, other farmers as well as from VM-trained facilitators and stakeholders in the group. An action plan is jointly created, agreed to, implemented, monitored and evaluated.

**MODEL 2 – ORCD/CPSW:** The second model is a research-based intervention method. ORCD methods are crucial for galvanising an effective and sustainable development program. ORCD **respects all participants as equals and experts in their own areas** in the effort to surface the fundamental issues that need to be addressed.

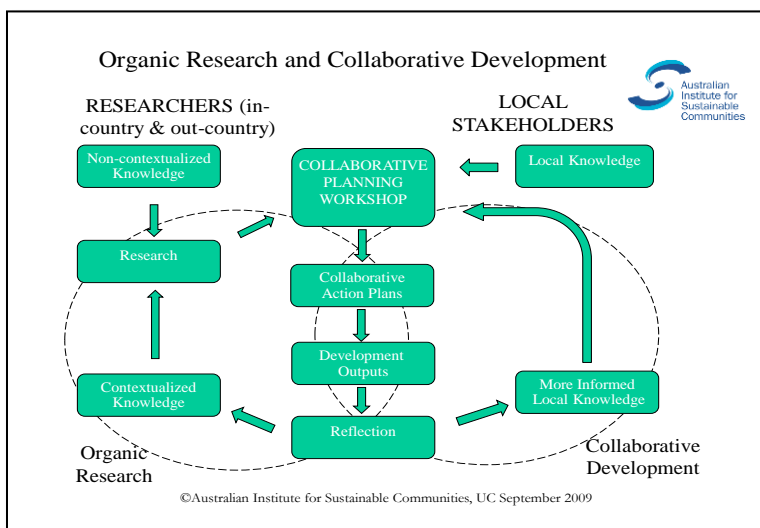
As shown in Figure 1, knowledge is assumed to come from local stakeholders, farmers themselves, as well as both researchers and local practitioners from different disciplines. This acknowledges the farmer as “expert” and enhances the collaboration and multi-disciplinary perspectives. Ultimately, all stakeholders agree on an action plan that in turn leads to





Training sessions of men and women farmers under CPS model

development outputs that are evaluated by the project team and local stakeholders during the reflection phase. This reflection is then expected to lead to a subsequent round of research activity, and hence the research is adaptive. Using this process, we expect to maximise the chances that research outputs will be developed that align with the requirements of farmers and other local stakeholders and hence, that are also likely to have a high rate of adoption.



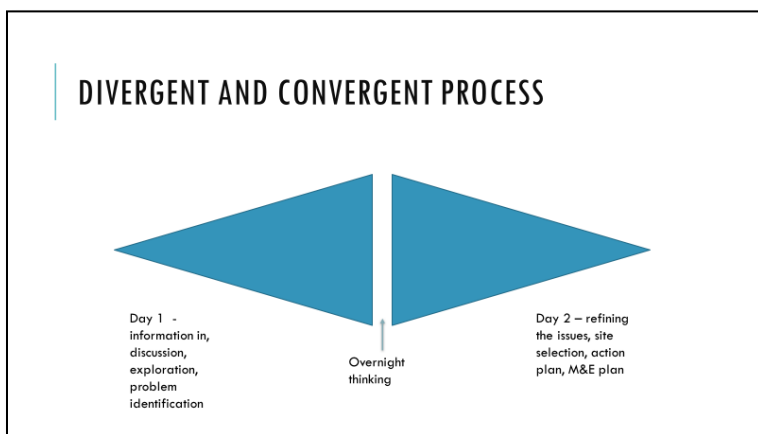
**Figure 1: Organic Research and Collaborative Development (ORCD) Process** (Spriggs and Chambers, 2011)

In the ORCD method, the following steps are followed with the farmers who are taught to facilitate the ORCD method for themselves. The researchers/facilitators conduct this method in collaboration with the farmers, ensuring they become

capable facilitators of the ORCD method. ORCD is organised around annual collaborative planning workshops over the life of the project.

CPS is a structured process involving a divergent and a convergent phase moving from a very broad exposure and discussion of ideas and potential solutions to a final action plan to address the problem.

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### MODEL 3: DISCOVERY LEARNING

Discovery learning can occur whenever people are not provided with exact solutions or methods but, rather, tools and resources. In this case, the project will supply the scientific water and nutrient detection kits and basic explanations for farmers to experiment and realise different and improved practices for improved irrigation profitability.

Prior knowledge and personal experience play a key role in this approach of largely unguided detection of new patterns and possibilities. Discovery learning differs from other formal and guided learning methods because it relies on inductive reasoning or discovering insights and generalisations from instances rather than deduction or working from general principles first. Discovery learning is both an individual and group method. In this project, discovery learning will be encouraged at both individual and collective levels with groups of farmers.



Some glimpses of Discovery Learning

In this project, initial props are provided, which are the scientific water and nutrient kits, with a brief explanation of how they work. Additionally, there will be some facilitation and leadership in the form of opportunities for guided reflection, with the demonstrators of the various tools as a group of farmers strive for emerging insights and practices.

This model provides the scientific tools and a non-interventionist facilitator. After farmers have enacted some actions and are making some progress, the facilitator enquires about progress and asks farmers to critically reflect on their thinking and actions.

### Women's Engagement

While there is a focus globally on engaging women in all ACIAR's projects it is very important that we do not disrupt the local cultural practices which as we know in Pakistan vary greatly at a provincial village, clan and family level. **Respect and valuing the local** is a very important principle in working with communities.

One way of possibly overcoming this but not excluding the voice of women is **to**

**run your VM and CPS workshops with the women first** and getting their views, issues and ideas and then taking them to



Women facilitator with female farmers in a training session

the workshops with the men. This is considered a legitimate way of running such workshops and gives voice to the women.

We have found doing this often gives the men a different perspective on issues and ideas and helps to shape meaningful action plans for their village and farms.

### **Youth Engagement**

The age of technology is here, and young people of both genders are like sponges soaking it up and leading the way. So, if you have

farmers who do not like technology or lack the access to it recruit some young men and women to act as photographers, water monitors, story recorders and writers, etc. Invite them to the workshops and encourage their participation as equals, value their ideas and harness their energy.



Women farmers along with their children in a practical training session.



A woman farmer (with child) is weeding the vegetable plot at her house



A boy is taking photograph (with mobile phone) of his vegetable plot.



Furrow irrigation of a cauliflower field.



Cultivation of off-season vegetation and protection from weather effects.



A field is being laser-levelled for irrigation saving



Two young boys participating (with SOFT Facilitator) in soil sampling



A boy observing FullStop installed in citrus orchard

## Other Stakeholder Engagement

If we are to get **sustainable change** to land, water and irrigations management we need more than farmers we need many people involved. Issues and problems need to be explored from many different perspectives.

Everybody views the matter from their own position: the water engineers who has invented a wonderful tool to measure soil moisture sees it as a good idea for every farmer to install one on their farm to reduce the amount of water used; the person who controls the flow of water in the canals views it differently; the farmer sees it as a water shortage; the ASP thinks if the farmer conserves water he will not be able to sell so much fertiliser.

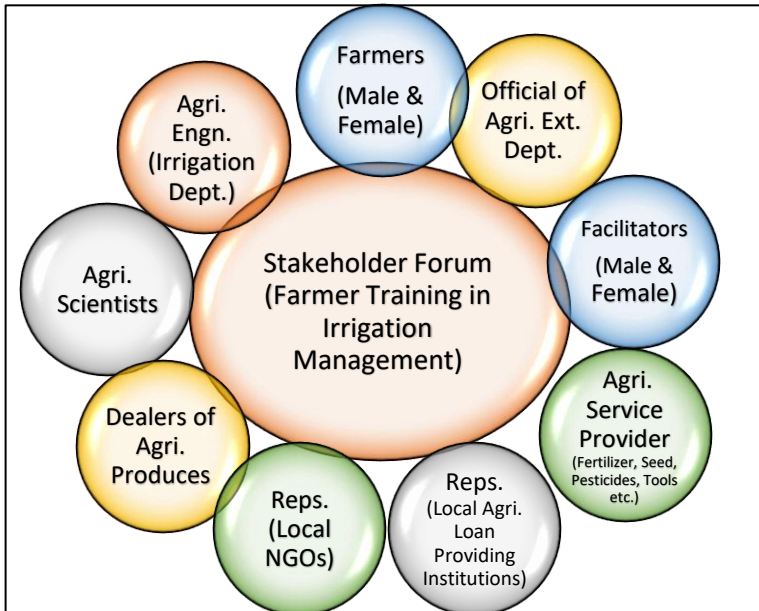
So, each one has different views of the same issues and each one has different ideas on the solution – none of which in isolation will form a meaningful and sustainable solution.

These sorts of issues are known as “**wicked problems**” – multiple views and ideas with multiple solutions. It is only by bringing all stakeholders together to expose all the differences can we arrive at realistic solutions which are manageable and cost effective to all concerned.

This then is why you need to invite multiple stakeholders to the workshops. We already have farmers, other villagers, water engineers, soil scientists, agronomists, facilitators and social scientists but in each district, there are the relevant local people who you need to think about and invite to come for at least the first workshop in each village so as to expose



the problem to its fullest extent and find solutions which are manageable and achievable.



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Meeting of Stakeholders Forum (Farmers Training in Irrigation Management) in district Sargodha

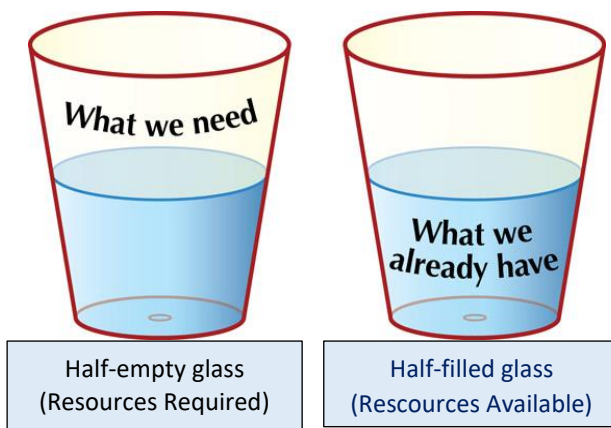
## FARMER INTEGRATED LEARNING MODEL (FILM)

CPS and VM shared common elements and all farmer learning take place through supported and informed DL. So, integrating them into FILM is a logical step – **you do not need to learn anything new just blend them together.**



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FILM and Asset Based Community Development (ABCD) are very closely linked. In ABCD we view communities as valued equally with all others in workshops used in FILM. A good way to show that you value and respect the farmers as well as others in the workshop is to open your workshop with short exercise to highlight each person's assets or strengths. The ABCD exercise included below is a very short format of what is known as a capacity inventory which social researchers may do in some of the villages, but it works well in the shortened form to give respect and value to all participants in workshops.



Some pre-workshop activities are needed to strengthen and merge the three models into FILM, these include:

## Pre-workshop research

### 1. Imprecise Problem Identification

Prior to visiting with communities, you and researchers may have an imprecise idea of what problems exist for farmer families in a district. For example, poor water and irrigation management, lack of sanitation and hygiene, low crop yields, poor education for girls etc. So, you need to consider what may the issues be, what you may encounter and who may be useful to help address the problem before you set out.

### 2. Stakeholder Analysis

- *Identify ALL stakeholders*
  - Who has information?
  - Who are the decision makers?
  - Who could benefit?
  - Who could be losers?
  -

### 3. District and village information: \_\_\_\_\_

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Bad condition of water pond used for drinking and bathing of livestock



Scenario of wheat germination in a saline and waterlogged field



Situation of water standing in an uneven field irrigated by flood method



Over-use of water by flood irrigation method in a roses field



Unhygienic conditions around a domestic water hand-pump



A village-level school lacking basic facilities

## Workshop Format

### Day 1 or morning

- Getting to know you (ABCD introductions)
- Informing
- Discussing
- Exploring
- PROBLEM IDENTIFICATION AND CLARIFICATION
- Prioritising problems
- Generating ideas for action
  - ❖ SWOT analysis
- THINKING AND REFLECTING

### Day 2 or afternoon

- Refining the issue
- Reconsidering ideas
- Developing the action plan
- Assigning responsibilities
- Developing the feedback plan
- Assigning responsibilities



- ACTION using DISCOVERY LEARNING

## Detailed Format

### DAY 1 (or the morning session)

#### FACILITATOR ROLE

1. Divide the participants into 3-4 groups and each group had 4-5 members.

2. Table members should be mixed – e.g. farmer, facilitator, researcher etc. – ideally none from the same organization in each group
3. Finding out the **assets** in the group can be done with a few key questions
  - a. Ask each person to tell the group (this includes any stakeholders not from the village):
    - i. their names,
    - ii. what they do (e.g. job),
    - iii. what they like about living in (or working with) the village,
    - iv. what they are good at doing
  - b. As they answer iii and iv make a list on a flip chart or the wall and you will have a list of assets of those in the groups.
4. What we **think** we know about the issue –
  - a. Information presented – various formats – PPT, Video, pictures etc.
  - b. This information is what we know about the village, the water situation, i.e. the research you have done to prepare for the workshop

#### **FACILITATOR ROLE**

5. **The group facilitators make clear that the information is representative of the issue** (it may not reflect the reality in a particular village this is what further discussion will reveal). **The participants discuss the information, explaining to each other and to the facilitator what the different information means to them.** For example; a farmer, an engineer, a policy maker, all sees things

- differently so this is an opportunity to share their understanding.
6. Next, the facilitator asks participants Identify problems/concerns for each person at table
  7. The facilitator keeps track of the discussion, noting on the flip chart the concerns and comments etc.

### PARTICIPANTS ROLE

8. Participants then prioritize issues using the colored stars or dots (red major, blue medium, green minor)
9. Participants are then asked to focus on the major or medium concerns discussing ideas that are most likely to work to help address the issues.
10. Participants are then asked to explore the **Strengths Weaknesses Opportunities and Threats** to evaluate the ideas. These were recorded on the flip charts in each group.

STRENGTHS	WEAKNESSE
OPPORTUNI	THREATS

11. The SWOT of two categories (major and medium concerns) are posted onto the flip charts separately so that other groups can see them and compare what each group came up with. The workshop facilitator will then lead a discussion about similarities and differences amongst groups.

### **PARTICIPANTS' ROLE**

12. Each person to decide what ideas are the highest priority and the second highest priority for action. Each person is allocated one blue (priority one) sticker and one green (priority two) stickers to place on the relevant item.

### **FACILITATOR ROLE**

13. The facilitator then seeks assistance to count numbers of blue and green dots thus identifying the first and second priorities for action.

### **PARTICIPANTS ROLE**

14. The workshop is asked to agree or disagree with the facilitator's assessment.

**NB: this is a generalised format and may be modified as the workshop progresses, and ideas emerge.**

**Day 2 will be slightly different for the development of an action plan is worked through**

**DAY 2 (or the afternoon – after everyone has had a chance to think about the first half)**

1. In the same groups as Day 1 discuss any new ideas which may have come up for people
2. Work through Steps 12 to 14 above to reach consensus – this may alter the first and second priorities reached at Step 12 before
3. Develop the action plan around the two main priorities
  - a. Why – has been established in setting priorities
  - b. What – is going to be done



- c. When – is it going to be done
  - d. Where – is it going to be done
  - e. Who – is responsible to see it gets done
4. Develop a feedback plan
- a. How – will we know it worked/did not work
  - b. What - information do we need to know if it worked
  - c. When- will we monitor our plan
  - d. Who – will be responsible
- Once you have developed your action plan, for example “to trial some new tools to reduce water use” and identified what stakeholders are responsible for the actions you can start to work in the fields with farmers demonstrating the various tools and techniques using the DL approach. Teaching them about correct installation and how to use the tool/s they have chosen.
    - DL methods will get the farmers to experiment and play with the equipment
  - You will then meet with them, in the fields on a regular basis to ask them how they are progressing, what they have learned etc. and teaching them using DL other aspects of crop and irrigation management as is right for them at the time
  - Another full workshop can then be conducted as new issues arise or farmers start to talk about problems – this should happen about once every month to six weeks.
  - Again, you follow the same process for your workshop.

In the research phase before the workshop you can get villagers to take photos of things they like/do not like about their village, their farming practices, irrigation practices etc. If they do this on a mobile phone and send it to you before the

workshop you can make up a sample of some of them to take to the workshop and get them to tell you the story of the image and why it is a problem or an asset. This is a modified form of **visual ethnography** and is helpful for getting people engaged – it is particularly useful for getting youth of both genders engaged in the workshops and the project overall.

Using visual ethnography, you can take photos along the value chain (VC) for the various commodities farmers are producing and engage them in a SWOT analysis to help identify how they can better manage the VC and where they need help.

This should mean you spend a long session with farmers about every 6 weeks and your other visits will be shorter to work alongside them in the field using DL. This will mean the farmers will lean “just in time” about new technologies and practices but they will also come to understand the leaning model.

**Remember** if other stakeholders were also responsible for any of the actions you will need to follow up with them and encourage them to also visit with you to the farmers.

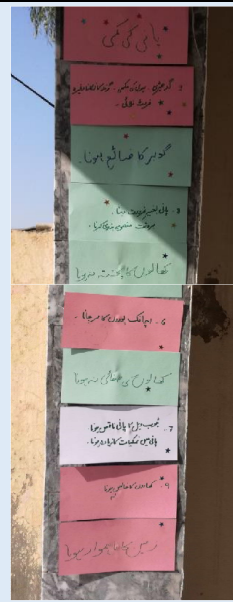
**Note:** Two elaborating examples are given in the following pages for better explanation and understanding of male & female farmers and facilitators.

## Example-1: Management and irrigation of citrus orchard

<b>Step-1: Participants introduction &amp; other related information</b>					
<b>District:</b> Sargodha. <b>Village:</b> Chak No. 88-SB. <b>Season:</b> Rabi (Winter)					
Start of Session: with recitation of few verses from the Holy Quran					
Name	Education	Age (Y)	Profession & skills	Land (Acre)	Expectation & Desires
Asghar Ali	Middle	50	Agri. & Livestock	2.5	High production & profit
Tasawar Hussain	Master	53	Agri. & Livestock	10	Modern & profitable agriculture and clean environment
Gazanfar Ali	Matric	66	Agri. & Livestock	3	Judicial distribution of irrigational water and overcome its deficiency
Azmat-ullah	F.A.	40	Agri. & Livestock	5	Training in modern agricultural practices and provision of financial resources
Abdullah	Primary	60	Agri. & Livestock	5	Availability of quality seeds, fertilizers and pesticides
M. Ashraf	Matric	45	Agri. & Livestock	17	Availability of irrigation water, Increase in prices of agricultural commodities
M. Usman	Matric	35	Agri. & Livestock	12.5	Overcome water deficiency by adopting modern agricultural practices & tools
M. Irfan	F.A.	30	Agri. & Livestock	13	Regular supply of canal water
Qaisar Nadeem	Primary	37	Agri. & Livestock	1.2	Reduction in input costs and availability of canal water
Shahzad Mukhtar	Matric	37	Agri. & Livestock	10	Awareness and practical trainings on alternate & verified methods of cultivation using less water

## Step-2: Identification of Problems

- Shortage of canal water
- Tube well (ground) water is unfit (high concentration of salts)
- Fields are not uneven (not levelled)
- Unlined water channels. Cleaning is not done regularly
- Irrigation without need (no planning is done)
- Problems of mealybug, flower fly, fruit fly, Gummosis
- Farm-yard manure is wasted



### Project selection by mutual consultation:

Integrated methods for water (irrigation) conservation and management of citrus orchards.

### Step-3: Asset-Based Community Development (ABCD)

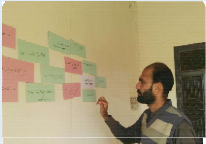


Half-empty glass  
(Resources Required)

Half-filled glass  
(Resources Available)

- Modern tools and machinery
- Inadequate supply of irrigation water
- Knowledge and skills for modern irrigation methods
- Identification, reasons and integrated management of diseases and pests.
- Market flooded with low quality seeds, fertilizers and pesticides
- Low quality (unfit) ground water
- Advance information and training for management of citrus orchards
- Training on compost formation

- Agricultural land
- Citrus orchards
- Mutual cooperation among farmers
- Canal and tube well water available for irrigation (limited quantity)
- Traditional methods of orchard management
- Capacity for experimentation
- Traditional tools for orchard management
- Local information, knowledge & skills
- Chemical control methods of diseases and pests
- Working capacity
- Strength to make decisions
- Will to improve productivity
- Livestock

<b>Step-4: Prioritization of Problems (by voting)</b>			
<b>Problems</b>	<b>First (Top)</b>	<b>Second (Mid)</b>	<b>Third (Low)</b>
			
Shortage of canal water	◆◆◆◆ ◆◆◆◆	◆◆	
Tube well (ground) water is unfit (high concentration of salts)	◆◆	◆◆◆◆	◆◆◆◆ ◆
Fields are uneven (not levelled)	◆◆◆◆ ◆◆	◆◆◆◆	
Unlined water channels. Cleaning is not performed regularly	◆◆	◆◆◆◆	◆◆◆◆ ◆
Irrigation without need (no planning is done)	◆◆◆◆ ◆◆	◆◆◆◆	
Problems of mealybug, flower fly, fruit fly, Gummosis	◆◆◆◆ ◆◆◆◆	◆◆	◆
Farm-yard manure is wasted	◆◆◆◆	◆◆◆◆	◆◆◆◆
<b>Two Priority Problems:</b> <ol style="list-style-type: none"> <li>1. Use of alternate and tested irrigation methods to overcome water deficiency</li> <li>2. Management of diseases and pests</li> </ol>			

<b>Step-5: SWOT analysis of proposed creative ideas and actions to control Gummosis disease (related to high soil moisture contents) and conservation of irrigation</b>			
<b>Proposed creative ideas and actions:</b>			
<ol style="list-style-type: none"> <li>1. Irrigation by making basins around fruit trees</li> <li>2. Irrigation decisions based on information/data generated by water tools</li> <li>3. Drip irrigation</li> <li>4. Conservation of soil moisture by mulching</li> <li>5. Laser levelling of orchard fields</li> </ol>			
<b>SWOT analysis of ideas</b>			
<b>1. Irrigation by making basins around fruit trees</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Availability of land and orchard</li> <li>• Mutual cooperation among farmers</li> <li>• Will and capacity to carry out new experiments</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate machinery</li> <li>• Desired man power</li> <li>• Arrangement of money to meet expenses</li> <li>• Additional time</li> </ul>	<ul style="list-style-type: none"> <li>• Water saving</li> <li>• Reduction in tube well cost</li> <li>• Control of Gummosis disease</li> <li>• Reduction in weeds</li> <li>• Cultivation of addition crop (vegetables) on water channels</li> <li>• Reduction in pesticides cost</li> </ul>	<ul style="list-style-type: none"> <li>• Water will not be available to the plants according to their need</li> <li>• The plants will die due to dryness</li> <li>• Increase in production cost.</li> <li>• Reduction in income</li> </ul>

<b>2. Decision of irrigation based on results of advance soil moisture detecting tools</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Availability of land and orchard</li> <li>• Mutual cooperation among farmers</li> <li>• Willing to carry out new experiments</li> <li>• Fond of learning new technologies and tools</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of new technologies and tools.</li> <li>• Training in use of new tools</li> <li>• Additional time</li> <li>• Shift from traditional irrigation methods</li> </ul>	<ul style="list-style-type: none"> <li>• New tools and trainings will be provided by the project</li> <li>• Water (irrigation) saving</li> <li>• Reduction in tube well operational cost</li> <li>• Reduction in prevalence of diseases caused by over moisture (irrigation).</li> <li>• Reduction expenditure by adopting need-based irrigations</li> </ul>	<ul style="list-style-type: none"> <li>• Timely availability of tools</li> <li>• Timely organization of trainings</li> <li>• Technical support for repair &amp; to remove faults of tools.</li> <li>• To spare time for training</li> <li>• Difficulty for uneducated farmer in use/operation of advance tools</li> </ul>
<b>3. Drip Irrigation</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Availability of land and orchard</li> </ul>	<ul style="list-style-type: none"> <li>• Initial cost</li> <li>• Requirement of technical</li> </ul>	<ul style="list-style-type: none"> <li>• Use of less water</li> <li>• Reduction in tube well</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure continuous supply of water</li> </ul>



<ul style="list-style-type: none"> <li>• Mutual cooperation among farmers</li> <li>• Willing to carry out new experiments</li> <li>• Fond of learning new technologies and tools</li> </ul>	<p>training for support</p> <ul style="list-style-type: none"> <li>• Provision of agricultural loans</li> <li>• Requirement of time for regular look after</li> </ul>	<p>operational cost</p> <ul style="list-style-type: none"> <li>• Conservative and need-based use of water</li> <li>• Reduction in spread of weeds in open spaces</li> <li>• Reduction in use &amp; expenditure of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Requirement of technical support in case of operational faults</li> <li>• Theft threats</li> <li>• Chances of damage during ploughing and hoeing.</li> </ul>
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**4. Soil-moisture conservation by mulching**

<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Required space available</li> <li>• Needful skills available</li> <li>• Raw materials required for mulching (sugarcane leaves, farm-yard manure, rice</li> </ul>	<ul style="list-style-type: none"> <li>• Additional expenditures</li> <li>• Unavailability of labourers</li> <li>• Decomposition of mulching materials may take long time.</li> </ul>	<ul style="list-style-type: none"> <li>• Conservation of soil moisture</li> <li>• Easy and doable</li> <li>• Possibility of increasing organic matter in soil.</li> <li>• Reduction in use of chemical fertilizers</li> </ul>	<ul style="list-style-type: none"> <li>• Timely availability of required materials</li> <li>• Uncertainty on cost &amp; benefit situation</li> <li>• May harbour pest and diseases</li> </ul>

stems) is available locally. • Mutual cooperation among the farmers	• Time required for preparation	• Cleaning of environment	
<b>5. Laser levelling of orchard field</b>			
<b>Strengths</b>	<b>Weaknesses</b>	<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Availability of land and orchard</li> <li>• Mutual cooperation among farmers</li> <li>• Willing to afford expenses</li> </ul>	<ul style="list-style-type: none"> <li>• Local availability of laser leveller.</li> <li>• Unskilled operators</li> <li>• Difficult to operate laser leveller in orchard</li> </ul>	<ul style="list-style-type: none"> <li>• Saving of water (irrigation) by levelling the fields</li> <li>• Uniform availability of water to the plants</li> <li>• Reduction in water-expenses and increase in profit</li> </ul>	<ul style="list-style-type: none"> <li>• Chance of damage to the orchard plants</li> <li>• Increase in expenses/cost</li> </ul>

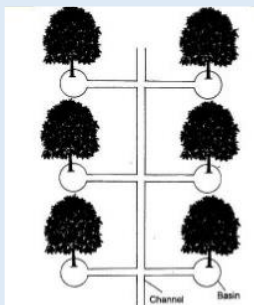
<b>Step-6: Prioritization of ideas for action plan</b>		
<b>Ideas</b>	<b>First priority</b>	<b>Second Priority</b>
Irrigation by making basins around fruit trees	◆◆◆◆◆◆◆◆	◆◆
Irrigation decisions based on information/data generated by water tools	◆◆◆◆	◆◆◆◆◆◆◆◆
Drip irrigation	◆◆◆	◆◆◆◆◆◆◆◆◆◆
Conservation of soil moisture by mulching	◆◆◆◆◆◆	◆◆◆◆◆◆
Laser levelling of orchard fields		◆◆◆◆◆◆◆◆◆◆◆◆◆◆
<b>Decision: Conduct experiment on irrigation method by making basin around plants</b>		

### **Step-7: Action Plan, Working and Results**

The SOFT Facilitator, Shah Najaf Mukhtar invited a relevant expert, Mr. Waqas Raza from the Sargodha University in a session organized with farmers

- After deliberation and mutual discussion, it was agreed that due to flood irrigation water is wasted, cost is increased and high moisture in soil become cause of spread of Gummosis disease in citrus, which results in decrease of citrus production and death of fruit plants as well.
- He shared following preventive measures to overcome the Gummosis disease in citrus:

- The effected trees should not be injured
- Minimize tractor operation in orchard
- The pair of scissors and other tools used for tree pruning shall be disinfected before use.
- Instead of used farm-yard manure use compost prepared from it.
- The hoeing shall be carried out in the month of December



A sketch of basin irrigation system

- Mr. Tasawar Hussain was the first farmer who volunteered to conduct this experiment in his orchard. Therefore, he manually developed irrigation channels and basins around the fruit plants following the given design and himself paid all the labour costs.



Agriculture expert Mr. Waqas Raza is imparting training

- Over the time Tasawar Hussain shared with fallow farmers that this intervention has helped a significant reduction (about 50%) in irrigation water



Manually develop water basin & channels in a citrus orchard

- During a discussion session the farmers exchange views on requirement of labour and time for development of water

channels and basins in large-sized citrus orchards. After thought provoking deliberation it was decided and they should design & develop (with help of Agri. Engineer) a special tractor operated plough to make the water channels.

- So, five farmers of the group came forward to contribute PKR 5000 each to meet fabrication cost of the proposed 20 ft. (6.1 m) plough (self-help basis) and get the job done. This



The plough purchased by farmers (on self-help basis) to develop water channels in citrus orchard

plough was found suitable to make 1 ft. (30 cm) deep water channels between the lines of citrus (Kinnow) plants.

- Using this plough, Tasawar Hussain shifted his 10-acre citrus orchard (Gummosis effected) to Basin Irrigation System.
- As the orchard was at developing stage and water channels running through open spaces between the plant rows were considered appropriate to cultivate some other short-duration crops. Therefore, the farmers decided experimental cultivation of gourd (local varieties) as additional crop on one-acre area of the orchard.
- Tasawar Hussain shared the benefits of these experiments with fallow farmers. He reported that with the canal water allocated for the subject orchard, he was never able to irrigate more than 3-acres of the orchard by flood irrigation method. Now with the same water he irrigates (by basin irrigation system) more than double the area of orchard. In addition, it is helping to control Gummosis disease and getting additional income from the vegetables.



The water channels developed by tractor-operated plough and vegetables (as additional crop) cultivated in citrus (Kinnow) orchard

## Example-2: Vegetables at household level (Kitchen Gardening)

<b>Step-1: Introduction of participants and other related information</b>					
<b>District:</b> Bahawalpur <b>Tehsil:</b> Yazman <b>Village:</b> Chak No. 86-DB. <b>Season:</b> Rabi (Winter)					
Start of Session: with recitation of few verses from the Holy Quran					
<b>Name</b>	<b>Education</b>	<b>Age (Y)</b>	<b>Profession &amp; skills</b>	<b>Land (Ac.)</b>	<b>Expectation &amp; Desires</b>
Hurmat Bibi	Uneducated	40	Housewife, Stitching & Livestock	1.5	Pesticide free food & environment, children education
Faizan Bibi	Uneducated	38	Housewife, & Livestock	4	Profitable income from livestock, pesticide free food
Attya Aziz	Uneducated	37	Housewife, & Livestock	5	Safe food for family, clean environment, children education.
Zeenat Bibi	Uneducated	30	Housewife, & Livestock	8	Livestock management for profitable production, pesticide free food.
Arshad Bibi	Uneducated	35	Housewife, & Livestock	20	Pesticide free food & environment, children education
Zahoor Begum	Uneducated	40	Housewife, & Livestock	13.5 (on rent)	Livestock management for profitable production, pesticide free food and healthy family
Ameeran Bibi	Uneducated	55	Housewife, & Livestock	12	Pesticide free food for family, clean environment, children education
Sobia Bibi	Uneducated	25	Housewife, & Livestock	4	Good livestock production for profit, pesticide free food
Manzooran Bibi	Uneducated	40	Housewife, & Livestock	5	Pesticide free food, Good health & production of livestock
Azharaan Bibi	Primary	30	Housewife, & Livestock	12	Pesticide free food for family, clean environment, children education
Sabiha Bibi	Matric	26	Housewife, & Livestock	3	Health & education of children, Good breed, health and production of livestock
Manzooran Bibi	Uneducated	45	Housewife, & Livestock	8	Children education, pesticide free environment & food.

**Step-2: Identification of Problems**

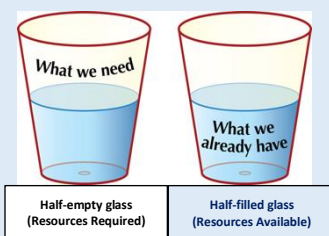
- Vegetables are not cultivated at local (village) level
- For vegetables' purchase, the males have to travel to market which results waste of their time & loss to work and also incur extra expenses on travel fare or petrol cost.
- The vegetables available from the market are not fresh, inferior in quality, impregnated with pesticides.
- Prevalence of diseases are high in children and adults due to low quality food
- The village lacks a good quality hospital.
- No proper drainage system in the village
- There used to have animal dung dispersed in the streets, giving ugly look & environmental pollution as well as wastage of useful organic matter.

**Project selection by mutual consultation:**

Better utilization of local resources for vegetable production at household level




### Step-3: Asset-Based Community Development (ABCD)



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- Sparing time from already busy daily schedule
- Provision of quality seeds
- Regular care/look after
- Demand hard work
- Training on advance methods of cultivation and management
- Market flooded with low quality seeds, fertilizers and pesticides
- Awareness and training of advance irrigation methods
- Identification, reasons and integrated management methods of pests and diseases.
- Advance harvesting and preservation methods of the produce
- Selling/marketing of extra produce

- Land is available for cultivation of vegetables at household level
- People are worried about their health and desire to have quality food.
- Land/soil is suitable
- Capacity to work
- Strength to make decisions
- Capacity for experimentation
- Available traditional tools for vegetable cultivation
- Local information, knowledge & skills
- Appropriate supply of water
- Animal manure is available locally
- Women carry skills and recipes of preparing tasty traditional vegetables dishes, prickles and jams.

<b>Step-4: Prioritization of Problems (by voting)</b>				
<b>Problems</b>		<b>First (Top)</b>	<b>Second (Mid)</b>	<b>Third (Low)</b>
Vegetables are not cultivated at local (village) level		◆◆◆◆ ◆◆◆◆	◆◆	◆◆
For vegetables' purchase, the males have to travel to market which results waste of their time & loss to work and also incur extra expenses on travel fare or petrol cost.		◆◆◆◆ ◆◆◆◆ ◆	◆◆	◆
The vegetables purchased from the market are not fresh, inferior in quality, impregnated with pesticides.		◆◆◆◆ ◆◆◆◆	◆◆◆◆	◆
Prevalence of diseases are high in children and adults due to low quality food		◆◆◆◆ ◆◆	◆◆◆◆	◆◆
The village lacks a good quality hospital		◆◆◆	◆◆◆◆ ◆	◆◆◆◆ ◆
No proper drainage system in the village		◆◆◆◆ ◆	◆◆◆◆ ◆	◆◆
Animal dung dispersed in the streets, giving ugly look & environmental pollution as well as wastage of useful organic matter.		◆◆◆◆ ◆	◆◆◆◆ ◆	◆◆
<b>Two Priority Problems:</b>				
<ol style="list-style-type: none"> <li>1. Poor quality, pesticide impregnated and expensive vegetables purchased from the market are bad for the health of children and adults.</li> <li>2. Environment of the village is polluted by poor drainage system and spread of animal dung in streets</li> </ol>				

**Step-5: SWOT analysis of ideas for “better utilization of local resources for vegetable production at household level”**

**Proposed Creative Ideas:**

1. Designate some land for vegetable cultivation near house.
2. Designate some part of house lawn for vegetable cultivation.
3. The houses without lawn facility can use portable pots for cultivation of vegetables.
4. Use of fresh cow dung (animal manure) shall be replace with compost.
5. Control of weeds, diseases and pests by synthetic pesticides should be replaced with alternate effective & safe integrated pest management methods

**Strengths**

- Required land is available
- Favourite hobby of women and they have capacity to do it
- Can cultivate as per need and desire
- Capacity to do experiments
- Available traditional tools for vegetable cultivation
- Local information, knowledge & skills
- Appropriate supply of water
- Animal manure is available locally
- Women carry skills and recipes of preparing tasty traditional vegetable dishes, prickles and jams.

**Weaknesses:**

- Spare time from already busy daily schedule
- Provision of quality seeds at local level
- Require regular care & hard work
- Not aware about advance methods of cultivation and management
- Quality seeds, fertilizers and pesticides are not available
- Modern machinery and tools are not available
- Need awareness and training on advance irrigation methods
- Need trainings in identification, reasons and integrated management methods of pests and diseases.
- Needs training in preservation of extra produce
- Arrangement for selling/marketing of extra produce

<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• Pesticide free and hygienically produced vegetables will be available</li> <li>• Saving in time &amp; money for purchasing vegetables from the market</li> <li>• Additional income</li> <li>• Training in cultivation and management of vegetables</li> <li>• Betterment of family health</li> <li>• Landless women will be able to grow vegetables in house-lawns, at roofs in pots.</li> <li>• Use of compost in place of chemical fertilizers</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• On time availability of quality seeds, fertilizers and pesticides</li> <li>• Losses due to diseases and pests</li> <li>• Possibility of ineffectiveness of prosed methods for control of weeds, pests and diseases.</li> <li>• Unavailability of suitable water</li> <li>• Difficulty in regular look after</li> <li>• Theft of machinery and vegetables</li> <li>• Possibility of wastage of extra produce.</li> </ul>
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<b>Step-6: Prioritization of ideas for action plan</b>		
<b>Ideas</b>	<b>1<sup>st</sup>. priority</b>	<b>2<sup>nd</sup> Priority</b>
Designate some land for vegetable cultivation near house	◆◆◆◆ ◆◆◆◆◆◆	◆◆
Designate some part of house lawn for vegetable cultivation.	◆◆◆◆	◆◆◆◆◆ ◆◆◆◆◆
The houses without lawn facility can use portable pots for cultivation of vegetables.	◆◆◆	◆◆◆◆◆ ◆◆◆◆◆◆
Use of fresh cow dung (animal manure) shall be replaced with compost	◆◆◆◆ ◆◆	◆◆◆◆◆ ◆◆
Control of weeds, diseases and pests by synthetic pesticides should be replaced with alternate effective & safe integrated pest management methods	◆◆◆◆◆◆ ◆◆◆◆	◆◆
<b>Decision:</b> Getting skills in production of pesticide free and hygienically safe vegetables using local resources.		

### Step-7: Work Plan, Implementation and Outcome

After mutual discussion and with support of SOFT Facilitator (Ms. Muzammal) the women group decided that initially they should carry out the vegetable cultivation experiment at a common plot; so that the participants could have hands on training covering all the crop growth stages i.e. from sowing to harvesting (as given below). Manzooran Bibi with consent of her husband volunteered the plot for this practical training.



- **Selection of vegetables, time & methods of cultivations:**

SOFT facilitator helped the group in deciding selection of vegetables according to the season and their domestic requirements. For this purpose, a locally developed vegetable calendar by agriculture expert was considered for support. It was also followed for time and methods of cultivation.



- **Land Preparation:** The women took help of male farmers in ploughing/hoeing and application of farm-yard manure in the plot. After this, the group developed map of the plot based on the different vegetable varieties, their methods of cultivation



and irrigation conservation (water saving) strategies. The plot area was distributed in to furrows, beds and plains; as per requirements

- Compost Preparation:** Compost is usually prepared from tree leaves, left-over fodder by livestock, fruit & vegetable (kitchen) waste and cow-dung. It is highly recommended for small-scale vegetable production, fruit plants and pot cultivation of flowers, ornament plants & vegetables. Therefore, the SOFT Facilitator invited a local expert for conducting practical training to empower the participants for compost preparation. The exercise was considered essential to add value and make beneficial use of tree leaves, left-over fodder by livestock, fruit & vegetable (kitchen) waste and cow-dung



- Selection of Quality Seed:** The participants were apprised on identification of quality seed i.e. it should have optimum uniform size, good in appearance/texture; seeds smaller than normal size, shrunken, diseased, damaged by insects & pests shall be considered defective. In addition, before sowing the seeds should be tested by dipping in a water bucket; good



seeds will float while the bad ones will settle at the bottom of container. The participants were advised to get skills in preparing their own seeds.

- **Irrigation:** Efforts were made to get good production by adopting water/irrigation saving strategies/practices. For this purpose, the plot area was distributed in to furrows, beds and plains; as per requirements of different selected vegetable varieties; so as to irrigate maximum possible area with the limited available water. The participants were also apprised on negative effects of over-flooding on soil nutrients and were advised to avoid it.



For appropriate irrigation, the participants employed irrigation tools (Chameleon and Tensiometer) meant to determine soil moisture in crop fields. Purpose was to make the women aware & trained in determining level of soil moisture in relation to root depths of various vegetables. Traditionally

farmers are used to irrigate vegetables on weekly basis, but with use/help of these tools they were able to save two irrigations.



- **Hoeing and weeding:** The women regularly visited for looking after and maintenance of vegetable plot. They performed the hoeing and weeding activity collectively on need basis.



- **Identification and prevention of pests and diseases:** For timely information on occurrence and prevalence of pests and diseases, the group members along with SOFT facilitator were regularly observing the plants. The facilitator enabled them to identify diseases and pests as well as to make distinction between pest and beneficial insects. To produce safe (from pesticides) & healthy vegetables, the participants were trained in integrated pest management methods to control the pests and diseases.
- **Harvesting:** As the vegetables were ripening and ready to harvest, all the participating women were regularly called to take part in harvesting, so that they should be aware about quantity and quality of the produce.





- Benefiting from this initial practical training & experience, 10 women of this group decided to prepare a 5 Marla plot (each) near their homes to grow vegetables. The males of their families helped in preparation of the land/plot. SOFT Facilitator (Ms. Muzammal) contacted local resources/suppliers for providing quality seeds.

Details of these experiments are given in the following table:

Village: <u>Chak No. 86-DB</u> Season: <u>Rabi (Winter)</u>			Vegetable Production (Kg)									
No	Name	Plot size (Marla)	Radish	Carrot	Coriander	Spinach	Turnip	Fenugreek	Radish Pods	Garlic	Beet Root	Total
1	Manzooran Bibi	5	53	7	5.5	34	8	6.5	12	3	1	130
2	Arshad Bibi	5	65	18	5.5	38	11	6	7	3	2.5	156
3	Atya Azeem	5	60	24	5.5	20	14	4.5	8	3	6	145
4	Faizan Bibi	5	81	40	6.5	38	17.5	5	9	3	4	204
5	Sughra Bibi	5	52	15	6.5	26	16	4.5	14	3	2	139
6	Zaiban Bibi	5	46	2	5	21	10	8.5	2	3	0	97.5
7	Ameeran Bibi	5	18	8	5.5	9	2	2	2	3	0	49.5
8	Saima	5	22	8	5.5	13	2	2	5	3	1	61.5
9	Hurmat Bibi	5	24	6	5.5	10	1	6	2	3	1	58.5
10	Sabeeha Bibi	5	42	12	6.5	29	14	4.5	5.5	3	1.5	118
Total weight (kg)			463	140	57.5	238	95.5	49.5	66.5	30	19	1159
Market based prices (PKR/kg)			20	20	20	20	20	50	40	80	50	35.5
Total amount (PKR)			9260	2400	1150	4760	1910	2475	2660	2400	950	27965
Average income per family (PKR)			926	240	115	476	191	247.5	266	240	95	2796.5
Total area: 50 Marla; Total irrigations: 6; Chemical Fertilizers: 10 kg; Hoeing: 2; Farm-yard manure: 80 kg												

- After meeting their domestic needs, the women gifted vegetations to their neighbours and relatives.
- Some women dried and preserved the extra vegetables for off-seasons use.



- One participant (Farzana Bibi) of this group did a unique experiment to assess income and saving from her vegetables. According to her, before growing the vegetables she was used to spent PKR 25-30 (average per day) for purchase of vegetables from the market. After producing/availability of her own vegetables, she started putting the same amount in money saving box (pot) and saved PKR 750-900 per month. She used this money to meet expenses on clothes & education of her children and other domestic needs.

