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Gender, groundwater and livelihoods in Pakistan

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Contents

1	Executive Summary	5
2	Background and general introduction	7
2.1	Why gender should be considered in a project about groundwater	7
2.2	Building capacity to use systemic co-inquiry.....	7
2.3	Using that capacity; provincial gender co-inquiries.....	10
2.4	General methods.....	10
3	Sindh	12
3.1	Introduction.....	12
3.2	Methods.....	12
3.3	Results.....	14
3.3.1	<i>Women’s roles in agriculture</i>	14
3.3.2	<i>Women’s roles in water management</i>	14
3.3.3	<i>Women’s work- paid and unpaid</i>	15
3.3.4	<i>Access to information knowledge and training</i>	17
3.3.5	<i>Access to resources</i>	17
3.3.6	<i>Current additional pressures on rural women</i>	17
3.4	Recommendations	18
4	Balochistan	19
4.1	Introduction.....	19
4.2	Methods.....	20
4.3	Results: Zarghoon	21
4.3.1	<i>Overview of village</i>	21
4.3.2	<i>Livelihoods and women’s roles</i>	22
4.3.3	<i>Women and water</i>	25
4.3.4	<i>Difficulties and messy situations</i>	25
4.4	Results Malik Yar	26
4.4.1	<i>Overview of village</i>	26
4.4.2	<i>Livelihoods and women’s roles</i>	26
4.4.3	<i>Women and water</i>	27
4.4.4	<i>Difficulties and messy situations</i>	29
4.5	Balochistan summary	30
4.6	Reflections.....	30
5	Punjab	31
5.1	Introduction.....	31
5.2	Methods.....	31
5.3	Results from village 130/9-L Dera Rahim and village 9 R-GD	31

5.3.1	<i>Village profiles</i>	31
5.3.2	<i>Livelihood and women's roles</i>	32
5.3.3	<i>Women and water</i>	33
5.3.4	<i>Difficulties and messy situations</i>	37
5.4	Punjab summary	39
5.5	Reflections.....	39
6	Gender, groundwater and the LWR036 project	40
6.1	Key themes and differences among women across the three provinces	40
6.2	Conclusion.....	41
7	References	42
8	Appendix 1	43
9	Appendix 2	56

Figures

Figure 1	Co-inquiry capacity building at UAF, November 2017	9
Figure 2	Participants from the Cheeho District, Sindh	11
Figure 3	Women from a village in Sindh, drawing a rich picture to show their role in agriculture 13	
Figure 4	Discussion and 'brainstorming' around the rich pictures.....	13
Figure 5	Women, with their children, discuss their working lives	15
Figure 6	Participants from a village in Sindh, discuss their working lives through pictures.....	16
Figure 7	Woman and child with well laden camel, Balochistan.....	19
Figure 8	Men of Zarghoon participating in the workshop	20
Figure 9	Women of Zarghoon, Balochistan, drawing their stories	22
Figure 10	One of the women's diagram of the village Zarghoon	23
Figure 11	Village men's understanding of the work of the village women	23
Figure 12	Woman transporting fodder, Balochistan	24
Figure 13	The check dam as drawn by the female participants.....	24
Figure 14	Life in village Malik Yar, Balochistan.....	26
Figure 15	A story of the life of women in Malik Yar	27
Figure 16	Schoolgirls from Malik Yar enthusiastically drawing their story	28
Figure 17	More women at work, Mailk Yar	28
Figure 18	Women threshing rice, Punjab	32
Figure 19	A workshop participant from Punjab.....	33
Figure 20	women discuss groundwater, Village 130/9-L Dera Rahim	34
Figure 21	Drawings and ideas from Village 130/9-L Dera Rahim	35
Figure 22	Activities at village 9 R-GD	36
Figure 23	Women discuss water in 9R-GD	36
Figure 24	Men of 9R-GD discussing water.....	38

1 Executive Summary

LWR-036 is a project funded by the Australian Centre for International Agricultural Research (ACIAR) that is focused on improving groundwater management to enhance agriculture and farming livelihoods in Pakistan. The underlying logic of working to involve more women is that inclusion of women is not only more equitable, but also that the project is it is likely to be more effective. The voices of Pakistan's rural women have been essentially silent in relation to water management generally, and groundwater management in particular.

Individuals and groups need to have capacity to have a voice, and to act, and capacity 'building' is an ongoing part of enabling participation. Because the current groundwater management 'system' is dominated by men, a systemic approach to understanding the capacity needs of women in relation to the ACIAR project is needed. Focusing on systemic co-inquiry with leading women academics and NGO staff in Pakistan also provides immediate increased capacity in country, providing women (and men) with new tools and skills to explore wicked, messy and complex issue.

The gender co-inquiry in this project aims to bring women together to explore gender aspects of groundwater management. Two sessions to build capacity in using systemic co-inquiry were undertaken in Pakistan in November 2017, facilitated by Catherine Allan and Michael Mitchell. The first was at the Mehran University of Engineering and Technology Sindh, on November 10, and the second at the University of Agriculture Faisalabad in Punjab, on November 16.

Following the training the two consultants and lead authors of this report were employed in September/ October 2018 to undertake the gender co-inquires in the case study areas as per the table below.

Province	Workshop locations	Facilitator
Sindh	Cheeho Distributary, District Noushehro Feroze. Village Choudhry Nizam-ul-din Arain	Shabana Siyal
Sindh	Malwa Distributary, District Nawabshah, Village Nim Dahari	Shabana Siyal
Balochistan	Pishin district, Zargon village of UC Khohab	Rizwana Waraich
Balochistan	Pishin district, UC and Killi (village) Malik yar.	Rizwana Waraich
Punjab	Shahiwal and Okara Districts 130/9-L Dera Rahim	Rizwana Waraich
Punjab	Shahiwal and Okara Districts 9 R-GD	Rizwana Waraich

The facilitators were guided by the Project's provincial social leads- Dr Siara Akhtar, Dr Syed Khair and Professor Tehmina Mangan. Their overall approach was to talk with, and listen to, women and men of the villages in relation to women's lives and work. In all cases diagramming/ mapping was used to facilitate storytelling. These stories were told in a variety of languages, and in some depth. The 'results' in the report are the distilled stories synthesised and translated to English by the lead authors.

Drawn and verbal stories across the six workshops highlight the important roles that women have in terms of domestic management and supporting livelihoods in rural Pakistan. Women have a significant role at the village level, not only in doing the household chores but they are equally involved in the economic activities that can vary from place to place but one thing is clear that women have great contribution in this regard. The education, freedom and relative power of women varied across the case study area, their social position and even age, but it was clear that the burden of increasing water scarcity in rural areas is falling disproportionately on women. Many of the women in the workshops considered reductions in water quality and quantity were having

direct, and indirect negative impacts on the health and livelihoods of their families. In all the workshops the women showed that they are well aware of the decreasing availability of groundwater and they worry about how to overcome these issues. Most, however, see no clear way forward, nor clear pathways by which they can contribute to finding solutions.

This small exercise draws attention to the almost silent voice of women in the planning and management of agricultural water in rural Pakistan, and the enthusiasm with which they embrace the opportunity to be included, or at least heard. The exercise also highlights the complexities and difficulties of understanding the overall situation regarding diversity of women activities in details. More research is needed to understand the needs of women to empower them without increasing workload and security burdens. Participatory co- inquiry, and co design is one research pathway that builds capacity as well as understanding.

It is evident norms of thinking and practice are highly influential, but also that even very strong social and religious norms can be addressed and changed. As the economic studies and stakeholder forums develop in this project it is important to seek ways to include women, their perspectives and their skills.

2 Background and general introduction

2.1 Why gender should be considered in a project about groundwater

Sustainable management of Earth's resources was linked with participatory governance in Agenda 21, which notes that "Environmental issues are best handled with the participation of all concerned citizens, at the relevant level" (United Nations General Assembly, 1992). Gender mainstreaming is one of the major strategies used for ensuring the incorporation of gender perspectives in all areas of societal development and the promotion of gender equality (United Nations Office of the Special Adviser on Gender Issues and Advancement of Women, 2001). The mainstreaming strategy is to seek ways to include women in as a matter of course in projects and activities. This need to strive to include women in projects such as LWR-036 is given further impetus by Millennium Development Goal number 3, which is to promote gender equality and empower women (Kabeer, 2010). The emphasis on gender in this groundwater project aligns with the approach adopted by the ACIAR gender inclusiveness strategy for Pakistan (Aik Saath, 2018).

LWR-036 is a project funded by the Australian Centre for International Agricultural Research (ACIAR) that is focused on improving groundwater management to enhance agriculture and farming livelihoods in Pakistan. The underlying logic of working to involve more women is that inclusion of women is not only more equitable, but also that the project is it is likely to be more effective. This is because different perspectives are brought to bear on the complex issues such as sustaining irrigated agriculture in Pakistan, and a broader range of pathways for change are included. Participatory Rural Appraisals undertaken early in the project indicated that although women were important users and managers of domestic water, their voice was essentially silent in relation to water management generally, and groundwater management in particular (Khair et al. 2021).

Individuals and groups need to have capacity to have a voice, and to act, and capacity 'building' is an ongoing part of enabling participation. 'Capacity-building' describes knowledge and awareness-raising activities to support desired change (Moore et al., 2006). Capacity-building may include providing access to knowledge, and to spaces for learning and skills development, and opportunities for validation and moral support. Because the current groundwater management 'system' is dominated by men, a systemic approach to understanding the capacity needs of women in relation to the ACIAR project is needed. Focusing on systemic inquiry with leading women academics and NGO staff in Pakistan provides immediate increased capacity in country, providing women (and men) with new tools and skills to explore wicked, messy and complex issues.

This report firstly explains the training undertaken in the practice of systemic co-inquiry, then presents the outcomes of the co-inquiries as undertaken. The report concludes with reflections on the next steps for empowerment of women in the context of groundwater management.

2.2 Building capacity to use systemic co-inquiry

Systemic co-inquiry encourages a form of social learning based on shared learning that leads to change in actions (SLIM, 2004, Foster et al. 2018). The gender co-inquiry in this project aims to bring women together to explore gender aspects of groundwater management. Co-inquiry is a process that encourages people to think about their current situation, and design the future, together (Ison et al., 2011). This approach of learning about a system and where action can be best taken is particularly necessary in 'wicked', or messy situations.

Two sessions to build capacity in using systemic co-inquiry were undertaken in Pakistan in November 2017, facilitated by Catherine Allan and Michael Mitchell. The first was at the Mehran

University of Engineering and Technology (MUET), Sindh, on November 10, and the second at the University of Agriculture Faisalabad (UAF), Punjab, on November 16. Participating at the MUET workshop were Tehmina Mangan, Mehrunisa Siyal, Shebana Siyal, Abdul Rasheed Tareen, Asghar Ali, Muhammad Ashfaq, and at the UAF were Seher-un-nisa, Saira Akhtar, Anam Akram, Khadija Batool, Munzah Perveen, Perveen Akhtar, Asif Kamran, Mahreen Alam, Muhammad Zeeshan, Ahmad Zeeshan Bhatti.

The workshops were part of the LWR036 Project's approach to considering gender specific issues relating to groundwater. Capacity building in systemic co-inquiry was considered necessary as the Participatory Rural Appraisals (PRAs) undertaken earlier in the project locally confirmed suggested that issues of gender and groundwater in Pakistan present as 'messy', rather than simply difficult situations, and that systemic approaches to working with the issues are needed. The capacity building was framed by the desire to:

- discuss an overall framework for the gender co-inquires
- practice some of the activities that could be used to facilitate the co-inquiry
- begin to plan the gender co-inquires in each province.

A copy of Armson (2011) was provided for each province, as this book provides a framework for a general approach that considers:

- Engaging with complex situations
- Understanding complex situations
- Exploring purposeful action in complex situations
- Inquiring through action

Full reports from the two capacity building sessions are attached to this report as Appendix 1 and 2.



Figure 1 Co-inquiry capacity building at UAF, November 2017

2.3 Using that capacity; provincial gender co-inquiries

During October 2018 six systemic inquiry workshops were held, two each in Punjab, Sindh and Balochistan. The aim of these workshop was to articulate the complexity of women's lives and work, and go some way to co-designing new ways of practice.

Generally, in the rural set up of Pakistan women's involvement in agricultural farming and livestock rearing is often un-paid; they are considered the helping hands of their male family members. For many of these women agricultural labour is an extra workload besides doing household chores and caring for children and family elders. However, there are number of women who are working in other farmer's fields, doing cultivation and harvesting of different crops as paid labour, and others who are working as house maids and home-based workers. Moreover, rural women are also sewing clothes, weaving carpets, stitching embroidery (Bridal and Thread), and running shops and small businesses. Although rural women are undertaking a lot of work, their work is not well acknowledged as part of Pakistan's economy.

The engagement of women in the rural work force is often influenced by social, economic and cultural contexts, and in some social systems it is also strongly influenced by religious norms. There are similarities of rural women engagement in the agriculture farming, livestock rearing, domestic chores, groundwater management and other economic activities in different provinces in Pakistan, but there are also some observed dissimilarities. In some areas women are performing different economic activities, keeping in socially and culturally designed arrangements as per respective area per region specific socio-cultural and economically. However sometime religious norms influence the social structure, creating limitations regarding womens engagement in the economic activities.

This series of gender analysis workshops is helpful in building understanding among the intended beneficiaries of the project in selected case studies areas regarding the messy situations related to gender and groundwater management matters in Pakistan. Keeping in view this context women of these project selected case studies areas were gathered to explore the gender aspects of groundwater management. The workshops explored women's involvement in groundwater management in the context of their contribution in other aspects of farming, domestic chores and small enterprises. Additionally, to understand the rural women's engagement in the complex situation, the workshops explored women's knowledge and understanding, as well as exploring women's decisive actions to handle such circumstances. The workshops sought to better understand the extent to which women contribute to making decisions in the community and within the household, whether they have control in their earning, their access to the business opportunities, finances and to the information and knowledge.

2.4 General methods

The two consultants and lead authors of this report were employed in September/ October 2018 to begin the gender co-inquiry process within the case study areas. They were guided by the Project's provincial social leads- Dr Siara Akhtar, Dr Syed Khair and Professor Tehmina Mangan. The two facilitators were asked to base their approach on the systems inquiry techniques described above, and they also brought their own extensive experience of working with rural people in Pakistan.

The specific methods used in each province are described below, but the overall approach was to talk with, and listen to, women and men of the villages in relation to women's lives and work. In all cases diagramming/ mapping was used to facilitate storytelling. These stories were told in a variety of languages, and in some depth. The 'results' in the report are the distilled stories synthesised and translated to English by the lead authors, with minor editorial contributions from Catherine Allan.

Photographs are included with the knowledge and consent of the workshop participants.



Figure 2 Participants from the Cheeho District, Sindh

3 Sindh

3.1 Introduction

The rural communities of Sindh are facing many issues including scarcity of both drinking and irrigation water, land degradation due to water logging and salinity and low agricultural production, due in part to unavailability of modern technologies and poor infrastructure. These issues have significantly affected livelihood sources of farming communities and pushed them towards poverty. The situation in Sindh has become more complex with the passage of time with low levels of financial, natural, physical and human capital. During the last two decades farmers, especially men, have migrated from rural to urban areas of Sindh in order to seek alternate sources of income. Such conditions have given rural women an active role in on-farm and off-farm activities, and have also increased their work burden and responsibilities.

Women in Sindh are involved in crop production from sowing to harvesting stages, livestock earning and other allied fields of agriculture. Given the extent of work of rural women in agriculture, they should be recognised as women farmers rather than sharecroppers or helpers.

Two gender co inquiry workshops in Sindh were organised and facilitated by Shabana Siyal:

1. Cheeho Distributary, District Noushehro Feroze. Venue: Village Choudhry Nizam-ul-din Arain
2. Malwa Distributary, District Nawabshah. Venue: Village Nim Dahari

The participants were female land owners, sharecroppers, and agricultural labourers. Also present were children, both girls and boys.

The objectives of both workshops were to work together to;

- identify the role of women in agriculture and other associated fields
- identify the participation of women in ground water and irrigation, and
- analyse the issues related to their work and consider their possible solution

3.2 Methods

Ethnographic and participatory research techniques were adopted to ensure effective participation of women to achieve the objectives of workshop.

Rich pictures were used to encourage women to tell and share their stories. The pictures enabled deep discussion in focus groups and encouraged brainstorming of ideas within the groups.



Figure 3 Women from a village in Sindh, drawing a rich picture to show their role in agriculture



Figure 4 Discussion and 'brainstorming' around the rich pictures

The outputs and ideas from the two workshops in Sindh are presented and analysed together in the following sections.

3.3 Results

3.3.1 Women's roles in agriculture

Women play a vital role in agriculture production from sowing to harvesting activities, livestock rearing and other allied fields of agriculture. They are important contributors in agriculture but their role has not been recognized yet. Women spent approximately 13- 15 hours a day in both domestic chores and agriculture activities. They start their farm activities and domestic chores in dawn and continue their work even after dusk.

The involvement of women in agriculture production is more than men but they are not appreciated due to social and cultural norms. These restrictions keep these women away from the natural resources and decision making.

If we have a glance of men's involvement in crop production then we will know that their involvement is higher in the early stages of cultivation such as purchasing inputs from market, land preparation, operating farm machinery and watering the fields.

Women are mostly involved in the pre and post crop production like sowing, thinning, weeding, picking, harvesting and seed storage. It was observed from the discussion that women's participation is higher in cotton production as this is considered to be women led activity.

3.3.2 Women's roles in water management

Water resources in study area consist of both ground water and canal water but due to shortage of canal water most of the farming is dependent on ground water. It was revealed from the workshop that the participation of women in the agricultural production has been very significant but are almost invisible in relation to irrigation. In some cases, widows or single females with no adult male living in the house request other males to manage their field operations. In relation to households, women play an important role in water management, as there they are the collectors, users and managers of water. Because of these roles, women have considerable knowledge about water resources, including quality and reliability, restrictions and acceptable storage methods.

Women do not play any role in decision making regarding water management at the field level, purchase/sale of farming implements, land preparation and determination of type and amount of fertilizers (pesticides, herbicides) used due to traditional and cultural barriers.



Figure 5 Women, with their children, discuss their working lives

The shortage of canal water has increased the use of groundwater, but due to heavy discharge from tube-wells the quality of water has become brackish and unsuitable. Poor-quality groundwater use for irrigation has seriously reduced the agricultural production, which has increased the livelihood burden on women because their spouses must go to other areas for income supplementation.

Low quality groundwater is also hazardous for their health, as it contains heavy metals that cause serious health issues for women and their families. Water fetching is the prime responsibility of women, therefore the entire burden of providing water to the family and livestock falls on women. This burden in turn puts pressure on women's physical and mental health. Some women shared that their soils were degraded and the ground water had become brackish and unsuitable for cooking and was not even suitable for washing clothes so they went to other villages for clothes washing, where ground water was sweet.

3.3.3 Women's work- paid and unpaid

Livestock is the primary source of income of rural women. Keeping and caring for livestock makes a significant impact on the household economy. Major activities performed by women in livestock management are shed cleaning including collection of dungs and making dung cakes for fuel, feeding, milking, and preparing ghee. Women collect fodder from fields for small ruminants while men have responsibility of grazing large animals outside from the homes. Men are responsible for taking care of sick animals, grazing and marketing of animals including selling and buying. Along with livestock women also rear poultry and eggs for family consumption.



Figure 6 Participants from a village in Sindh, discuss their working lives through pictures

Along with agricultural activities women spend time in performing household activities with full devotion and spirit. Preparing food, cleaning the house, fetching drinking water from the remote area, collecting wood for the fire and looking after the children and other family members are main task performed by women. Women make continuous efforts to contribute the household economy by making handicrafts (quilts, pillow covers, bed sheets). Therefore, we can say these women perform a multi-dimensional role.

Women of study area devote two third more time to working than men, they also struggle more for their survival and economic well-being; in fact, they are primarily responsible for cultivating and harvesting food crops needed by household livelihood but their efforts go unpaid and unrecognized. Generally they are unpaid for labour, resulting in no economic reforms. Even when they are paid problems remain. The women involved in wheat harvesting, cotton picking, vegetable picking and sugarcane cutting earn some income. It was revealed from the discussion that women's participation is high in cotton picking and this is considered to be primarily a female activity. Women are involved in numerous primary and secondary cotton operations including weeding and thinning, hoeing, cotton cleaning, stick removing and storage of cotton seed for domestic use. Women are concerned, as workers which get low or unfair wages from their land lords. There are roughly three types of arrangements through which women work in cotton picking. First, as small work only on own family farms or on farms of close relatives. Second, women from sharecropper tenant families work not only on their own farm but also on farms of other tenants for the same landlord. Third, there are jamadars (or labour contractors) who organize teams of women and take prior bookings from farmers for the supply of workers.

One lady participant shared that she only received Rs: 300 to 400 for picking one Mund (40 kgs) cotton. And they have capacity of picking only 20-25 kgs of cotton/day due to other domestic burdens.

3.3.4 Access to information knowledge and training

Women do not have any proper information about the livestock management which includes feeding animals, milk processing along and diseases along with their vaccinations. They usually use traditional (desi) treatment for their sick animals. They also have to face the problem of shortage of feed resources especially in drought condition.

Women of the study area have low skills and the products made by them are only suitable for household use and have no economic value. The reason behind this is the unavailability of vocational training facilities that limits women's ability to improve their income.

It was analysed from the workshop that there is lack of knowledge, low level of education and unawareness in women about their rights.

3.3.5 Access to resources

It was observed from the focus group discussion that land ownership is strictly held by the male villagers, which deprives women from land ownership although women devote more time in fields than men.

Though many women have their own land they do not get involved in water issues and they prefer their men to do this job. Due to traditional and cultural barriers, women are restricted to participate in water management at field and household levels.

Some women shared that they had their own land because their husbands had passed away, but they got support from their brothers or cousins to manage their lands. Women shared that when their children would become adult then they would take responsibility of land management.

One women with the age of 60 years shared that her father had passed away when she was a child and had left land for her. She had three sisters and did not have any brother, as she was the oldest she decided to manage her father's land by her own and also took the responsibilities of her little sisters. She added that she had made her two sisters marry and also had distributed the land among her sisters. Now she visits her land with Manager hired by her in her own car and makes decisions herself regarding the land.

Women shared that they have ownership of livestock, as when a girl gets married their parents give animals as a gift (traditionally called daaj or jahez), and women also purchase animals from their savings/earnings from labour. Women shared that if their men required money for purchasing inputs for their fields or in case of any emergency, they sell their animals. They also sell milk, allowing them to purchase food items, clothes and other necessary items.

Regarding water management, women of study areas have often been underestimated from their productive role in the policy making, especially in water management, their role is ignored and limited to domestic purposes. This is because men have been predominant policy makers for water management in agriculture and farm works while women have been thought to be responsible for household chores

3.3.6 Current additional pressures on rural women

Women in study area face many problems related to their own as well as their family's health. As it was observed that women play vital role in cotton picking and cotton crop is severely sprayed of chemical poisonous, in result they suffer from vomiting and skin rashes, and by continuously working in fields they also suffer from heatstroke. Some women leave their infants at home with their mother in laws or house head, but those women who do not have any female house head at home, take their child or infant to field, which cause serious health issues to their children. Many women must go to distant areas for fetching water, and they say the heavy weight of water causes them different kinds of diseases. Consuming poisonous food causes many reproductive problems,

and by consuming low quality water they suffer kidney stones. Due to poverty, women along with their children do not receive proper nutritive diet which is reason for diseases. When they become economic worker in agriculture, it negatively affects her productivity that is already low.

Recently women have been put into more complex and demanding life style influenced by the accelerated rate of male migration to urban areas in search of jobs and other earning opportunities. The trend of migration of men effects rural families as all the family responsibilities fall upon women, mostly the farm work.

When women were asked about climate change, they shared that since long time they observed variations in temperature like extreme heat or extreme cold, low rain fall, drought, long summer and short winter and high winds. Women are totally unaware what are the reasons of climate change and what are the effects of climate change on their livelihoods. They only knew that high temperature reduced their capacity in field work and also domestic chores.

3.4 Recommendations

- To provide capacity building programs through Women Open School (WOS), Climate Smart Farmer Field School (CSFFS), Livestock Management Farmer Field School (LFSS) to women to use modern techniques and tools in crop production, livestock management to improve the productivity.
- To provide kitchen gardening and nutrition training to women to improve household nutrition and reduce household expenditures.
- To ensure the participation of women in decision making, awareness programs should be given to women so that they can recognize their rights of having land, water and sufficient quality and quantity of food to meet their nutritional needs.
- To provide new skills in expanding production for women in small scale agribusiness.
- Training programs like tailoring, embroidery could be fruitful in income generation perspective.
- To enhance access of women to safe drinking water and build their capability to maintain themselves.
- To promote the adoption of environment-friendly activities through capacity building in agriculture to reduce the hazardous effects of chemical fertilizers and pesticides on the human and soil health.
- The traditional method of irrigation caused wastage of water, so capacity building programs should be provided to male farmers like furrow irrigation, drip irrigation and sprinkler irrigation.
- To raise awareness of farmers regarding the importance of organic farming including farmyard manure, green manuring crop organic pesticides.
- Water harvesting techniques.
- Conservation agriculture practices like maintaining and managing a permanent soil cover, minimum soil disturbance (zero tillage and direct planting) and diversification of crop species (crop rotation and intercropping)

The above listed recommendations are not specifically for women but as males are counterparts of agriculture so they can also be provided opportunities in capacity building programs.

4 Balochistan



Figure 7 Woman and child with well laden camel, Balochistan

4.1 Introduction

In Balochistan two gender workshops were facilitated, by Rizwana Waraich, in the two selected case studies villages in district Pishin, the Zargon village of UC Khohab and UC Killi (village) Malik yar. About ten women and five men participated in the workshop in village Zarghoon and 13 women and 4 men participated in village Malik Yar.

District Pishin is about 50 kilometres from Quetta city situated in the northwest of Balochistan province of Pakistan. The district Pishin is famous for horticulture and agriculture in Pakistan, being renowned for greenery, with fertile land suitable for many crops and fruits. The area has thousands of hectares of fruit orchards, and is also famous for the growth of vegetables and fodder. There is a manmade spring 'Karez'. This artificial spring is made in order to use the subterranean water for irrigation purposes.

Before starting the workshops the facilitator met the male community members, introduced herself and her team, briefly introduced the project, which later gave her an introduction to the women participants. Rizwana also shared with both men and women separately the purpose of visit and explained why this workshop was going to be conducted, and also managed. Both men and women participants listened enthusiastically and showed willingness to fully participate in the workshop. The word 'gender' was also explained to both men and women.

While introducing the purpose of visit the facilitator tried to use the language that participants can easily understand, as a number of women can speak and understand Urdu. There are women who can only speak Pusto, so the facilitator also conveyed her message through the translator and get their point of view during discussion and women activity mapping exercise.

Rizwana explained the reason of workshop was to understand women's responsibilities in managing the water particularly the groundwater management. It was shared that women will be asked which situations they feel are difficult or 'messy'.

The importance of both men and women in water management was noted by the facilitator. Women have primary duty to manage the household water supply, usage and sanitation as water is not only necessary for drinking and irrigation but equally used for food production and preparation, livestock caring, personal cleanliness, cleaning, washing and waste water disposal. As women have extra dependency on the water resources so they have significant information about the water resources, including location, quality and storage procedures.



Figure 8 Men of Zarghoon participating in the workshop

To avoid any backlash while conducting workshops in Balochistan facilitators consciously involved both men and women in these workshops to win the confidence of all segments of the society, particularly men. In consideration of the local social and cultural values men and women did their activities at separate places. Another reason to conduct male and female activities separately because in the presence of men usually women cannot speak openly, are hesitant to participate with confidence and shy to share the actual information. Although men and women did their activity separately, the focus of discussion was on gender and groundwater management. It worked out and team did their work without any hindrance.

4.2 Methods

In conducting the workshops in Balochistan a mixed-methods design was adopted with participants working in groups through community participatory inquiry approach, informed by the systemic inquiry capacity building. The facilitators tried to ensure that every woman participated in the

discussion and workshop activities, particularly in women's activity mapping exercise to ensure their involvement and understand their point of view.

Focus group discussion (FDG) was used to gain an in-depth understanding of socio-economic and cultural issues. FDG is widely used in conservation research, considering the sensitivity of the discussion. So, to understand women perspective in more openly this FDG discussion is always useful. Key Informant interviews (KIIs) was used to collect information from the people who have more in interaction with different segments of the society including community leaders, professionals or residents have firsthand knowledge about the community. Individual discussions with other women who wanted to share information also occurred.

Mapping (diagramming) exercises were also employed. Mapping is an inter-sector tool provide a reliable, useful and timely overview of the overall living conditions/situations of the women, men, girls, boys and people with disability involvement as work force inclusive their access to basic public services, job opportunities, education, health facilities, information and available resources. In this case mapping was used explore

- Women's activities (domestic & economic (Paid and un-paid)
- groundwater resources
- Women's engagement in groundwater management

The Workshop facilitator made some general observations throughout the workshop proceedings about the issues and sensitivity associated with the workshop subject gender and groundwater management. It helped in understand the actual situation through face- readings, body language, facial expression and eye messages of workshop participants.

Women actively participated in the workshop, and the facilitator also invited men to know their views about women and their sensitivity regarding women work in both villages of Balochistan. The women's active participation and interest in the workshop activities, especially in activity mapping exercise, was remarkable. In the beginning women were little shy but later they were fully involved and openly shared their knowledge regarding their domestic and economic activities. Women explained their responsibilities, roles, concerns openly as well as discussed matters connected to the groundwater management.

Pictures of workshop activities are useful to capture the events proceedings and a proof that event was done. In village Zarghoon workshop facilitators asked both men and women before getting the picture or recording the workshop proceedings. They allowed women and girls to have their pictures taken on the condition that women and girls faces will not be visible in the pictures and video recordings.

In the village Malik Yar men and women both did not allow the women and girls participant's pictures and video recording, so facilitators only have pictures and video recording of the school girls who were excitedly involved in the women activity mapping exercise.

4.3 Results: Zarghoon

4.3.1 Overview of village

Zargoon is a village of about 200 houses, most of its residents belong in the higher, middle and lower middle class. Schools are available for girls and boys also a health dispensary is available for basic health treatment. General stores and groceries are also available. Electricity supply is there but with long durations of load shedding, so people have alternate system, having solar panels at domestic level and to run the solar motor pumps for pumping out irrigation water.

The education level is comparatively high among men, and girls' education is improving. There are number of girls who have completed their graduation, some girls have Masters degree. The number of children going to school has increased, with almost every family involved. Some girls are studying in Pishin city and Quetta.



Figure 9 Women of Zarghoon, Balochistan, drawing their stories

People of this village are well aware about the work of NGOs, and are even well informed about government development programs. Balochistan Rural Support Program (BRSP) has been working in the village for more than five years by involving community activists. Water programs were initiated by the BRSP in the village with the full participation of the community. This community is comparatively progressive, allowing their young girls to visit Quetta to attend meeting and workshops conducted by the BRSP or other NGOs. A Check Dam locally named kalla Bahar Dam was constructed with the support of the BRSP to overcome the water shortage issues.

4.3.2 Livelihoods and women's roles

The main source of livelihood of this village people is agricultural farming, livestock rearing, vegetable farming and fruit orchards. A shortage of groundwater means their fruit orchards are gradually drying and they are losing this source of income. The water shortage also affects their production of vegetables. Village men are now compelled to labour in nearby cities, including Quetta. The educated men are doing jobs in different government and private sector institutions.

Women are involved in livestock rearing, collecting grass and fodder for them. Some old women take their livestock for grazing near the small check-dam (locally called Kala Pahar Dam). Women are also doing government jobs as teachers, local Health Workers, and taking tuitions, stitching clothes, traditional embroidery and doing business at domestic level, including white washing or distemping their room's walls, as well as running shops at village level. Women are also selling milk and its products and eggs. The village men also used diagrams to show their understanding of the work of women.

Women shared that young women are not allowed to be the part of any farming related activities in the field but women of age 40-45 years have no issues. One woman said that initially women were involved in watering the vegetable and fruit plants that they grow in the house courtyard.

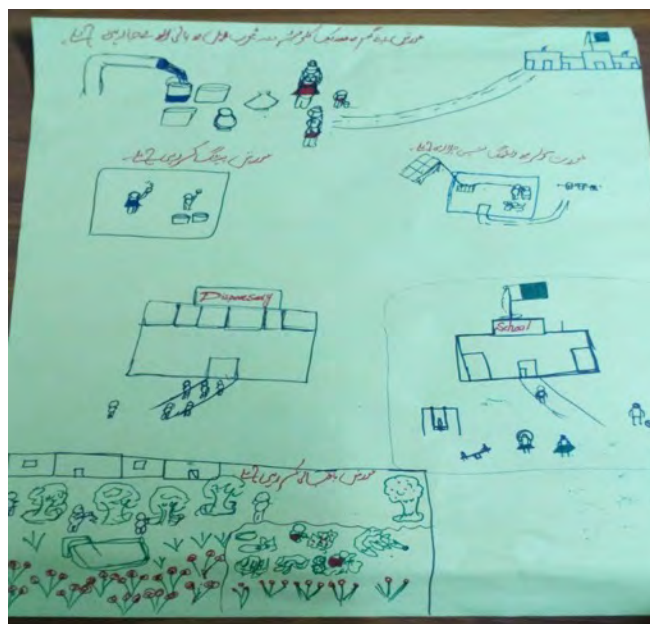


Figure 10 One of the women's diagram of the village Zarghoon



Figure 11 Village men's understanding of the work of the village women



Figure 12 Woman transporting fodder, Balochistan

Older women of age 45-50 years have no restriction on their movement within the village by with Pardha (Having Chadar) whereas young women cannot move freely, only occasionally can visit the relatives and friends. Regarding women's mobility out of the village for shopping, for job, education and meeting relatives, they cannot go alone but must be with their male family members or with the group of women. Women can go for recreation along with their male family members to the nearest small check dam.

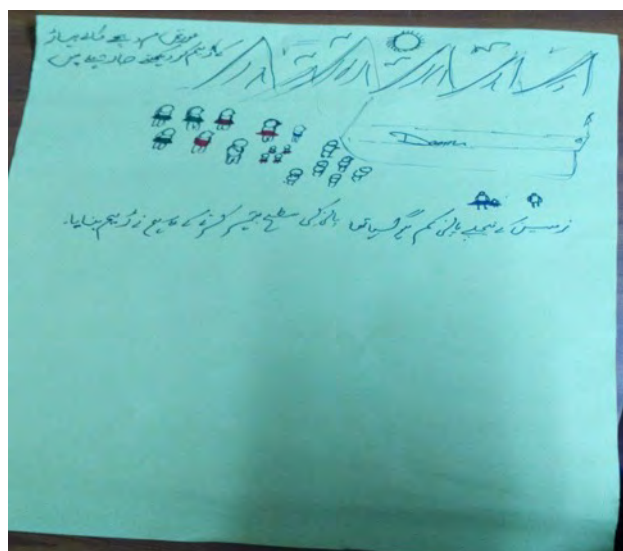


Figure 13 The check dam as drawn by the female participants

4.3.3 Women and water

Women are well aware of the decreasing availability of groundwater and they worry about how to overcome these issues. Recently a small check dam was constructed by the collaboration of BRSP, government and community but it is not enough to satisfy the actual need.

Women said that they are very much involved in groundwater management but only at the domestic level, whereas the irrigation of agriculture farming groundwater is managed by the men, as it considered men's purview. Some women note that they are involved in vegetable growing at household level as well as in their field. At household level women take care of watering the vegetables but in the field, men are responsible.

Women also shared their knowledge regarding depletion of groundwater resources, suggesting it is due to less rain and excessive usage of groundwater to irrigate the crops and fruit orchards. They shared that in the near past they had enough groundwater when the community sucked the water through traditional wells, but after the installation of the peter-pumps and electrical water motor pumps the groundwater table level became low and now they are facing problems of shortage of groundwater not only to irrigate our agriculture farming, fruit orchards and vegetables but facing the problem of getting water for domestic use and drinking. Women shared that now most of the groundwater motor pumps are operated by solar system because of long hours of load-shedding. Women said that every household has their own solar energy system for domestic use for lighting and operating the water motor-pump. They suggested also that groundwater is reducing because of extensive cutting of the forest trees and no new plantations. One young woman said that after launching an extensive tree planation campaign the groundwater can be recharged. Women said that over population is another reason for the decreasing groundwater.

4.3.4 Difficulties and messy situations

Women face lot of difficulties, initially they faced family opposition for seeking education for girls. They continued their struggle, finally won and now there are a number of educated girls and almost all families are sending their daughter to schools for education. Women said that in past they faced difficulty in fetching water from the natural springs from the nearest mountains that was about one to two kilometres away from the village but later they found the solution and a small check dam was constructed that helped in improving the groundwater table level and they installed motor pumps at household level to pull out the ground water. Now again they are facing the lack of water not only for the irrigation of agriculture land and fruit orchards but even for domestic use so they are finding the way out and hopefully they will find the solution.

How to improve groundwater table level the women have no clear idea. They said that it could be improved by massive tree plantation, less use of water, population control but they are not very much sure about their ideas. Women said depletion of groundwater is increasing and they are worried at the moment with no idea how the situation will be improved. Women said that groundwater improvement and management is men's domain so women have no interest in this regard. Women only concern is that the need for water has to be fulfilled.

Women said as most of village men have gone to other cities and countries to earn for the family so women of those families are facing problem so they have to rely on male members of relatives that put women in trouble so they cannot find of proper way-out as per local socio-cultural context. Women said that they are involved in livestock rearing but cannot sell it by themselves because their bargaining power is not good and one can easily cheat them. For the same reasons they cannot sell their agriculture product in the local market. Women shared that they have no way out on how to overcome these issues.

4.4 Results Malik Yar

4.4.1 Overview of village

Village Malik Yar is a big village, famous for its large fruit orchards and vegetables growing area. The residents of this village are comparatively rich people, living in big houses covered by huge walls. There is a Basic Health Unit (BHU) available for health treatment. General stores and grocery shops are available even women running shops are available where women can go and shop. Transportation (wagon) is also available for people's travelling.

Girls and boys schools are available, and education among men is high, whereas women's situation in village Malik Yar is different from that in the village Zarghoon. The education level among women is very low. There are a few girls with primary level education, however the overall trend regarding girl's education has changed and now families are sending their girls to schools for education.



Figure 14 Life in village Malik Yar, Balochistan

Women can move within the village but with Pardha (cover them by chadar and Burqa). Within the village they can go to meet relatives, can shop from shops run by women, and go to see their friends. They can visit relatives on social and religious occasions, and can go to the girl's school. Most of the women, particularly the young, are not allowed to move out of village without their male family members. They are going to Pishin and Quetta for shopping with men, whereas women from the poor families are travelling alone or with the group of women. Water via tanker is available.

4.4.2 Livelihoods and women's roles

The major village livelihood source is agriculture farming particularly on vegetable growing and fruit orchards, as well as livestock rearing. Men are not only engaged in agriculture farming, but also doing business, labour work, running shops, doing government and private work in and out of the country.

Most of the village women are not only doing domestic work but also taking care of the livestock. There are number of women involving in small enterprise from their home like selling clothes, bed sheets, pillow cover, blankets, jewellery, cosmetics, toys, shoes and carpets. They are also running retailer's and grocery shops along their husbands. Women grow vegetables at home that they not only use for domestic needs but also sell it at the local shops, and in this way they can earn money.

Some women said that because they have big courtyards in their houses they grow fruit plants and vegetables. They sell the extra fruits and vegetables to the village shops. Women selling milk and its products, and eggs, claimed that they use that money by themselves. Some women are working as maids. Women and girls are also stitching clothes, doing embroidery. Few women are doing jobs like teacher and LHWs, but there are two to three women giving tuitions with the village.



Figure 15 A story of the life of women in Malik Yar

4.4.3 Women and water

The past groundwater situation was very good because there was a big dam named Hushdill Khan (locally named Band Hushdill Khan), and the groundwater table was very good, so there were no water issues. Now Band Hushdill Khan Reservoir has dried out due to lack of rainfall and the community is facing problems. There was enough surface and groundwater

but now situation has changed the groundwater table have decreased so it effects on the agriculture production particularly vegetable and fruit production. Water management related issues are usually handled by men, and women have no significant role in this regard.

Women said they are involved in groundwater management at household level but, irrigated groundwater is managed by men. They shared that previously there was no issues regarding availability of water but after the dryness of the Band Hushdill Khan and lack of rains they are facing the water related problems particularly on-going depletion of groundwater. Women said due to less rain our Hashdill Khan Dam reservoir became dry that also became a cause of the decreasing groundwater level. Women told that depletion of groundwater is due to over use of the groundwater and less rains. Even so, they note that powerful people are sucking water to fulfil the need of irrigating their large fruit orchards and to meet the other irrigation of other crops.

Women said in the past at the household level women are responsible to sucking out the water through traditional small well, but later started to use the electric motor pumps to suck the ground water, and this is the reason of groundwater depletion. Women said because of increase of population the use of water increased. Now a village farmer has installed big tube-well totally operated by the solar energy. Women said due to long load sharing duration every family is compelled to use solar energy system not just for agriculture farming but also for domestic use.

Women said that they are involved in livestock rearing but cannot sell it by themselves because their bargaining power is not good. Women said even to sell the milk they need the support of male family members.



Figure 16 Schoolgirls from Malik Yar enthusiastically drawing their story

Women are not allowed to move out without men's permission, so it is difficult for them to be actively involved in projects related to groundwater management so they are not even thinking of their role in this regard, it is totally men's domain.

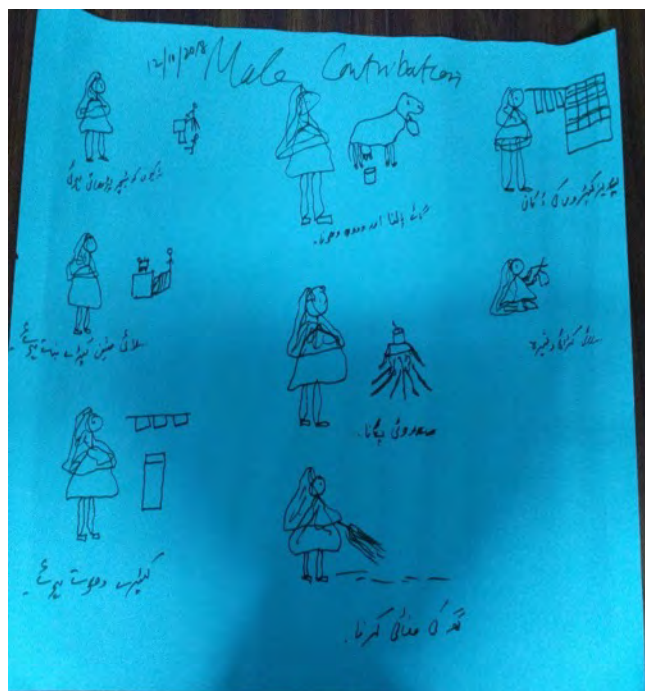


Figure 17 More women at work, Mailk Yar

Women said that they know about upcoming water issues and have worries in this regard. Already their male family members are establishing business in the nearest towns and Quetta, and some families have shifted to Karachi and are running their business and working. Women noted that a large number of men are doing jobs in the private and public sectors. When asked what measures you suggest to overcome the issue of groundwater depletion they replied they have no idea. Women said if the groundwater depletion increases and their fruit orchards finish they will be compelled to leave the place.

4.4.4 Difficulties and messy situations

Women face a lot of difficulties, including initial family opposition for girls' education; for example, one young woman, a mother of two small children, said they wanted to be educated, but are only able to get primary level education. Further education for her family was never allowed. She added that after marriage she thought that because her husband is a teacher he will let her complete her education, but her in-laws will not allow it. Women said that they continued their struggle for girl's education over time, and finally gained a girls high school, so that now in the village they have a primary and high school for girls. So now there are number of educated girls and almost all families are sending their daughter to schools for education.

Women said that in past they faced difficulty in pulling water from the traditional wells but later they found the solution, first installed hand pumps later installed motor pumps at household level to pull out the ground water. Now these motors are run by the solar system as every household has installed one. Women added that again they are facing the lack of water not only for the irrigation of agriculture land and fruit orchards but even for domestic use, so they are trying to find the way out and hopefully they will have success.

Women said that now a big solar tube-well has been installed to suck the groundwater that is used to irrigate the agriculture farms and fruit orchards. Similarly, another solar tube-well was installed to supply water to the household for domestic use. That has now become dry and the community is finding another place to situate that solar tube-well. Women said that when there is no water supply for domestic use they can get water through tankers, although it is costly but and they are compelled to pay 800 to 1300 PKR per water tanker.

The women have no clear ideas on how to improve groundwater table level. They said that it could be improved by using less water through a technical intervention from the government. Women are not very much sure about their role in groundwater management. Women said depletion of groundwater is increasing and they are worried and the moment they have no awareness how this situation will be improved. Women said that groundwater improvement and management is men's domain so women have no interest in this regard. Women only concern is that the need of water has to be fulfilled.

4.5 Balochistan summary

- Workshops in village Zarghoon and village Malik Yar were successfully conducted.
- Workshop participants were enthusiastic in sharing information during the workshop.
- Women are involved in groundwater management only at a domestic level whereas men are mostly involved in irrigation groundwater management.
- Women are well aware about the water depletion problem but they have no idea how to manage in village Malik Yar, while in Zarghoon village women suggested that it could be resolved through mass tree plantation.
- Women have assumptions that to control groundwater depletion requires technical kind of input so women have no role to play in this regard, it is men's domain
- Some young educated girls showed interest if project can provide any guidance or training regarding recharging the groundwater.
- Women expressed their interest in getting some other skill and professional training especially computer skills.

4.6 Reflections

- Women participants are eager to learn professional skills, showed interest in learning computer skills for other skills they never mentioned any specific skills, and were quite reluctant to define what professional skills they actually want to get.
- Women have less interest in irrigation groundwater management because they think it is men's domain. Women have the feeling it is quite difficult to handle so they are not involved in this matter
- Male participants are cooperative but they asked about their roles and contribution in the project related to groundwater improvement process.
- Male participants showed their eagerness in getting the contract to be awarded under the project in the village Zarghoon whereas in village Malik Yar men are only interested in how the government will overcome this growing problem of groundwater depletion.
- Communities are anxious to know when this groundwater reduction problem will be resolved.
- Working on women empowerment is quite challenging because although they are responsive because they are following the guidelines of their male members, to get any constructive result they need to bargain with the male community members.
- Women are not clear about their role in groundwater management, quite confused

5 Punjab

5.1 Introduction

In the Punjab province two workshops were facilitated by Rizwana Wariach, in the two selected case studies villages from districts Shahiwal and Okara. One village named 130/9-L Dera Rahim was at the right side of the LBW and the other village, 9 R-GD, was at the left side of the LBW. The villages are similar enough to combine their information below.

Before starting the workshops the facilitator met the male community members, and as per the Balochistan example this gave her an introduction to the women participants. Also shared with both men and women separately the purpose of visit and explained why this workshop is going to be conducted.

Both men and women participants listened enthusiastically and showed willingness to fully participate in the workshop. The word 'gender' was explained to both men and women, and the project's interest in women was because women have significant role at the village level, not only doing the household chores but they are equally involved in the economic activities.

5.2 Methods

As described for Balochistan, in conducting the workshops in Punjab a mixed-methods design was adopted with participants in working groups through community participatory inquiry approach. The facilitators tried to involve every woman in the discussion and workshop activities, particularly in the women's activity mapping exercise, to ensure their involvement and to understand their point of view.

Like Balochistan, to avoid any backlash while conducting workshops in these two villages of Punjab province, facilitators consciously involved both men and women in these workshops by keeping in view the need to win the confidence of all segments of society. Also considering the local socio-cultural values so men and women were involved in the workshop process and they did their activities at separate places. Another reason to conduct male and female activities separately was because in the presence of men usually women cannot speak openly, are reluctant to participate with confidence and nervous to share the actual information.

The men and women did not sit together but the discussion was focused on gender and groundwater management. It worked out and team did their work without any hindrance. Interestingly men themselves acknowledged women contribution in domestic chores and in the field. In these two villages there was no issue about taking photograph and recording the videos, people cooperated and expressed their willingness.

5.3 Results from village 130/9-L Dera Rahim and village 9 R-GD

5.3.1 Village profiles

Village 130/9-L Dera Rahim and village 9 R-GD are big villages. Residents belong to higher, middle, lower middle and poor classes, and the caste system dominates. The education level is very good among the both men and women. There is specific focus to educate both boys and girls. A number of men, women, girls and boys are matriculate, graduate and master degree holders. There was a doctor, army officer and PhD. Now the number of children going to school has increased, almost every family are sending their girls to the schools for education. There are private schools established besides government high schools for girls and boys in these two villages. After completing their village schooling

families send their children (girls and boys) to the nearest town and city to access higher schools. In this regard local level transport is available (Chin-Chi, Suzuki Wagon) however some families have their own transport (cars, motorcycle). In village 9 R-GD the facilitators saw a big play ground with bricked boundary walls.

There are untrained people offering health treatment services in the villages. However people prefer to consult the doctor available at the nearest city or BHU. About 80% of people have their own motorcycle and there are families have cars, and public transport Chin Chi (Motorcycle Rickshaw) and Suzuki wagons are available. Different general stores and grocery shops are available in the village, along with small workshops.

Women can freely move within the village to go for field work (agricultural farming and livestock rearing), collect water for drinking and cooking, go to schools, visit the relatives or friends, for shopping from village shop and collecting fodder for their cattle. They can go out of the village to the nearest town and big cities alone, with male family member, relatives and with other village women.

5.3.2 Livelihood and women's roles

The main source of livelihood for this village people is agriculture farming, livestock rearing and vegetable farming. Now due to low groundwater table and brackish groundwater effecting the quality of the land, production is gradually decreasing. Water shortages also affect their crops and vegetable production, particularly affect the rice crops. A number of families are involved in running businesses, doing labour in the nearest towns, working in government and the private sector, and a number of men have gone to abroad to earn for their family.

Women are not only doing domestic work but actively participating in the field activities. There are more involved in the livestock rearing and crop cultivation and harvesting related activities particularly women belonging to small land holdings. Women are involved in running small enterprise like running retail shops (General store), grocery shops, running traditional ovens, operating flour grinding machines. Women are also stitching clothes and doing embroidery. There are number of village women in these two villages who are agriculture labourers whereas some women are working as maids for the rich families whereas there are women who are working as maids in different cities. Women are also doing government jobs as teachers, LHW and taking tuitions at the village level. In both these villages' women are also running private schools and tuition centres.



Figure 18 Women threshing rice, Punjab

5.3.3 Women and water

There are similarities among the residents of these villages, in that they are well aware about the NGOs work, well informed about government development programs and they have good linkage with the Punjab Irrigation department; even women have information in this regard. Farmer associations have been established by the Punjab irrigation Department in these villages and are working quite actively.

These villages were initially totally reliant on canal irrigation water, with only a few traditional wells pulled by the bullock. With the passage of time the need for water increased and due to water distribution across Pakistan these village irrigation water supply became less. Because of the lack of canal water they started to dig the wells pulled by bullock. Later, large landholders installed big tube-wells called black engine tube-wells. These are quite costly, and as small land holders cannot afford to install them, they are compelled to buy the water. The cost of water is significant for the poor farmers. After that, Peter system (smaller diesel pumps) were introduced. These cost rupees 30,000 to 40,000 PKR and are affordable to the small land holders. Now electric motor pumps have been introduced, which people prefer as they move more water than Peter diesel pumps. Because of large-scale use of water, the ground water has become not only depleted but also salty.

Both men and women said that the overuse of the groundwater, increase in population, continuous cropping patterns, distribution of land, less land holding, removal of trees and gaps in rains due to climate change were the main reason of groundwater depletion. They have assumptions that groundwater became brackish (Karwa) due to increasing use of toilet systems and improper waste water disposal system could be the major cause.



Irrigation groundwater management is usually the men's domain but interestingly in these two villages there are number of women who are equally involved along with their male family members to irrigate the agriculture crops, even during odd timings such as midnight. It is notable that all these women belong to poor families.

Figure 19 A workshop participant from Punjab

Raj Bibi w/o Ehsan in village 130/9-L Dera Rahim is a strong woman working as helping hand for her husband soon after her marriage. She is a poor woman, and relies on her strength. She reared cattle that she takes on share basis, and the family has a small patch of agriculture land on contract, where she is equally doing all kinds of required work. Besides that, she is running the flour grinding machine.



Figure 20 women discuss groundwater, Village 130/9-L Dera Rahim

Similarly, in village 9 R-GD met two women named Zubaida w/o Abdul Waheed and Muneera w/o Late Mustafa. Both are involved in irrigating crops along with their male family members.

In the beginning women were a little shy to share anything but later they openly shared their information regarding their domestic and economic activities as well as depletion of groundwater resources. When asked how the groundwater will be improved they replied that they have to grow trees, have proper water disposable systems, proper toilet system and proper drainage systems, and also that they need to learn ways to use less use of water for the crops. The women have no idea on how to improve groundwater quality and increase the water table level.

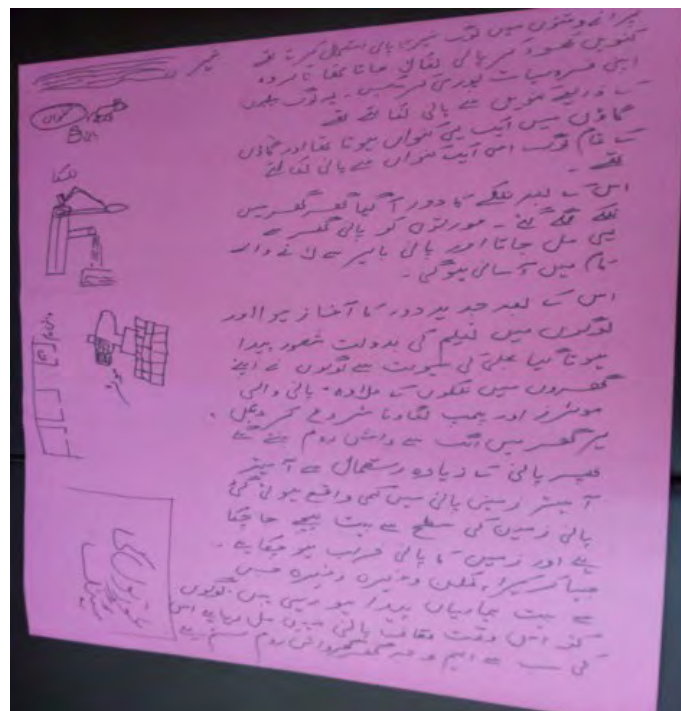
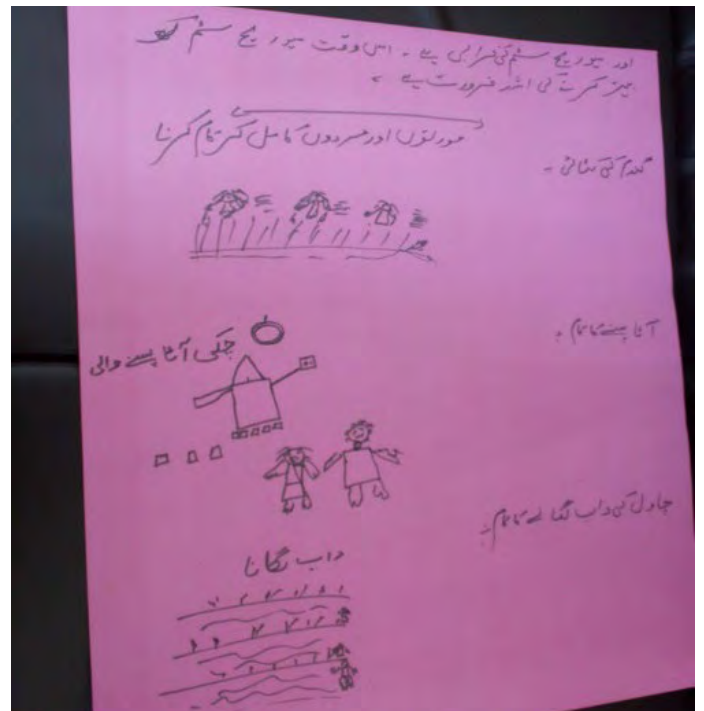


Figure 21 Drawings and ideas from Village 130/9-L Dera Rahim



Figure 22 Activities at village 9 R-GD

5.3.4 Difficulties and messy situations

At village 9 R-GD in Punjab women stated that they faced problems of brackish groundwater that is not good for drinking and cooking, and not even good for irrigation. After drinking the groundwater people of the village have stomach problems and suffered from hepatitis. So, it is difficult how to get rid of this groundwater because it even cannot be used properly for washing clothes and utensils. Women said that in the village mosque there is a bore for getting drinking water, bored to about 420 feet. They were able to get laboratory approved drinking water from this, and now all village households collect water for cooking and drinking from the mosque, even people from the neighbouring villages came to collect the water. Women added it is not long-term solution as it is going to be over used so there is a need for a permanent solution because sometimes they spend a whole day bringing that water, and this affects women's health. They are unclear what a permanent solution they could be, and are waiting for government initiatives.

The same situation is apparent in village 130/9-L Dera Rahim, where women are collecting water from a tube-well for drinking and cooking. They said that is hectic task for women and children. Women said that in past they faced difficulty in pulling water from the hand pump but later they found the solution and installed motor pumps at household level to pull out the ground water. Now these motor are run by the solar system as every household has installed a solar system.



Figure 23 Women discuss water in 9R-GD

How to improve groundwater table level they women have no clear idea. They said that it could be improved by less use of water, massive tree plantation, through population control. Government department has to guide the village people for improving the brackish groundwater through introducing new technical intervention from the government.

The women were not sure about their role in irrigation groundwater management, considering it as men's work to do. Women said that they are already overburdened so they do not want to get more work but they can provide support to their men. They said brackish groundwater and depletion of the healthy groundwater is increasing and they are worried and at the moment they have no knowledge on how to improve the situation.



Figure 24 Men of 9R-GD discussing water

5.4 Punjab summary

- Peoples (men and women) in these two villages were cooperative and willing to play role in groundwater management, expressed their willingness to cooperate with the project people.
- Workshop participants were enthusiastic in sharing information during the workshop, openly talked on the issues but need immediate results.
- Most of the women are involved in groundwater management only at domestic level and other economic activities however there are significant number of women who are involved in irrigating the crops and other agriculture related activities. Women have knowledge regarding groundwater depletion and are willing to resolve the issue. Whereas irrigation groundwater management is usually considered mens domain.
- Women are well aware about the groundwater depletion problem and also have some ideas to recover it but they said that due to less resources and less technical knowledge that are not able to do so and they need support in this regard.
- Women have assumptions that to control groundwater depletion requires technical kind of input so women have no role to play in this regard, it is men's domain.
- Women expressed their interest in getting some other skill, like running business, school administration, computer operation etc.

5.5 Reflections

- Women participants are eager to learn professional skills, showed interest in learning computer skills and running schools and small enterprise skills they also asked how to access the credit services.
- Women have less interest in irrigation groundwater management because they think it is men's domain. Women feel it is quite difficult to handle so they have no involvement in this matter
- Male participants are cooperative but expressed less interest groundwater improvement.
- Communities are anxious to know when this groundwater reduction problem will be resolved.
- Working on women's empowerment in Punjab is comparatively easy as compared to Balochistan.
- Women are not clear about their role in groundwater management, quite confused.

6 Gender, groundwater and the LWR036 project

6.1 Key themes and differences among women across the three provinces

Women are more or less actively engaged informally in economic activities in all these six villages in three provinces in Sindh, Balochistan and Punjab. Women living in rural Pakistan are not an homogenous group, even their status and livelihood strategies are not same, however they are involved in common roles of production, reproduction and household maintenance. The degree and approach of women's participation in an unpaid and income earning activities vary, and their access to economic resources are dissimilar.

There are some women involved not only in managing groundwater to fulfil the domestic needs but equally involved in irrigation groundwater management along with the male family members. In some other cases women are head of the household, and they hire labour to irrigate their agriculture fields.

- Women are involved in economic activities along with domestic chores in all six villages
- Women are engaged in paid and un-paid work in rural Pakistan
- Women are engaged in groundwater management at domestic level
- Women expressed interest in improved groundwater management but feel it is not their realm
- Women's contributions need more acknowledgment
- Women should be more empowered to act in planning and management of agricultural water in general, and groundwater in particular.

In Balochistan the women's position is more vulnerable than in Punjab and Sindh, so extra efforts are required to include them in groundwater planning. Men are very conscious and defensive when some outsider meets their women, so to work on women's matters we cannot avoid male involvement. Although in Punjab and Sindh there is equally a need to keep in loop men but they are comparatively liberal.

Women in Punjab are not only involved in groundwater management at the household level but there are number of rural women engaged practically in agriculture irrigation practices. There are significant number of women of age 40-60 years of age who have enough knowledge regarding groundwater management not only at domestic level but also for irrigation purposes.

In Sindh in particular, livestock management is an important aspect of women's lives, often providing household or personal income, along with crafts and other small businesses.

In general, while women are interested in water, they not comfortable regarding their involvement in the groundwater management, and difficult to see how they can play their role in this regard, and some are anxious about additional work loads.

Women in Punjab are more expressive, bold and have a role in family decision making even have control on economic resources. So, handling these women is quite challenging in the sense that they are quite sensitized on the issues that effects their lives. If they feel that any activity is just waste of time they will be back footed.

Women in Blochistan are more dependent, it is not easy to access the common women without powerful persons of the village so it requires appropriate community mobilization efforts not only to involve women but also men.

Many women in Sindh are heavily involved in agricultural production in addition to domestic duties, with added burdens in recent times with migration of men to cities for work.

Overall women's interests mostly revolved around their family. They want to play a role at larger context but have no idea how to make it up.

We note in conclusion of this section that the gender parity index for unemployment is higher for rural areas at 0.607, compared to 0.483 for urban ones. Under vision 2025, the government has committed to increase the female labour Force Participation Rate (LFPR) to 45% in general. The low female labour force participation rate is due to the significant social and economic barriers that usually women are facing (Shafqat, 2017).

6.2 Conclusion

This small exercise draws attention to the almost silent voice of rural women in relation to agricultural water management in Pakistan. It also highlights the complexities and difficulties of understanding the overall situation, especially given the diverse range of women's activities and positions in society.

There is a need to have extensive research to understand the women livelihood activities as they change in certain situations, in specific locations. To help women and their families we need to understand better how they operate within agriculture enterprises, where they have influences, and their modes of accessing the financial resources and how they are doing business dealings. We also need to know where, when, how and why women are included or excluded from the businesses due to local traditional, social, cultural and religious reasons.

As the economic studies and stakeholder forums develop in this project it is important to seek ways to include women, their perspectives and their skills.

There is particular need to develop the rural women entrepreneur's capacity, further improving their traditional business skills through latest business management techniques by keeping in view local traditional, social, cultural and religious contexts, improving their management skills and business performance, thereby stimulating job creation that will be helpful in contributing their role in overall economic growth, and reducing their dependence on groundwater. Further fostering more innovative and inclusive entrepreneurial eco- system for women entrepreneurs.

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8 Appendix 1

Notes from the co-inquiry workshop November 10, 2017, MUET

Introductions

Tehmina, Mehrunisa, Shebana, Rashid, Asghar, Ashfaq, Michael and Catherine

Difficulties and messes

Exercise to distinguish difficulties from messes

- 1) Think of something that you have to sort out as part of work or home, something that you know you will be able to do, even if it will take some effort. This might be something like buying a new bed, or organising a party.
- 2) Now, think of something that you are working on that you have been struggling with for a while, but that you cannot really see what to do or where to start.
- 3) Now, consider whether these are the same sort of thing, and if not what makes them different?
 - a. Some answers to this were size, not understanding all of the consequences of action in 2, having some control in the first one, but not in the second

The issues in the first category could be called difficulties- they are not necessarily simple, but you can tackle them with a plan of clear steps. The issues in the second categories might be called messes, messy situations, or wicked problems. They need a different approach from linear step by step approaches.

This workshop introduced you to systems thinking as one possible approach for working with messes.

We are working on the assumption that tackling issues of gender and groundwater in Pakistan is a messy situation, rather than simply a difficult situation.

The gender co-inquiry in the groundwater project

- We want to bring women together to explore gender aspects of groundwater management.
- We think gender in groundwater management is a messy situation so systems thinking and tools may help
- The different tool is that we are not **asking people what they need** but enabling a process where **they can see if there is something they can do together**.

This workshop

- discuss an overall framework for the gender co-inquires
- practice some of the activities that you could use to facilitate the co-inquiry
- begin to plan the gender co-inquires in each province.

Overall framework for the gender co-inquires

There is no set procedure or steps for co-inquiry- it is an approach, rather than a method.

Rose Armson's book *Growing Wings on the way* sets out a general approach that considers:

- Engaging with complex situations
- Understanding complex situations
- Exploring purposeful action in complex situations
- Inquiring through action

Engaging with complex situations

Start with trying to understand the complexity of the situation. A good way to do that is

Rich pictures

Rich pictures are 'rich' because they have detail and lots of things going on in them. It is rich like a good fruit cake is rich.

Individuals draw their own rich picture of the situation

Use a large sheet of paper and a thick pen if possible

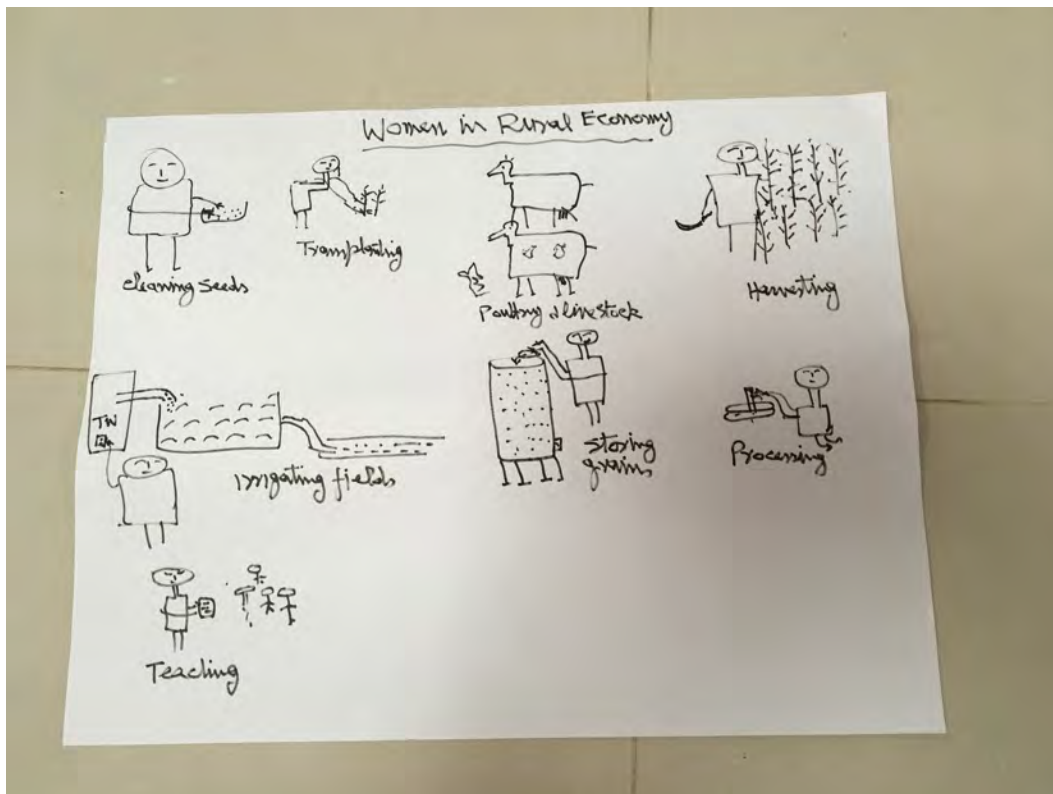
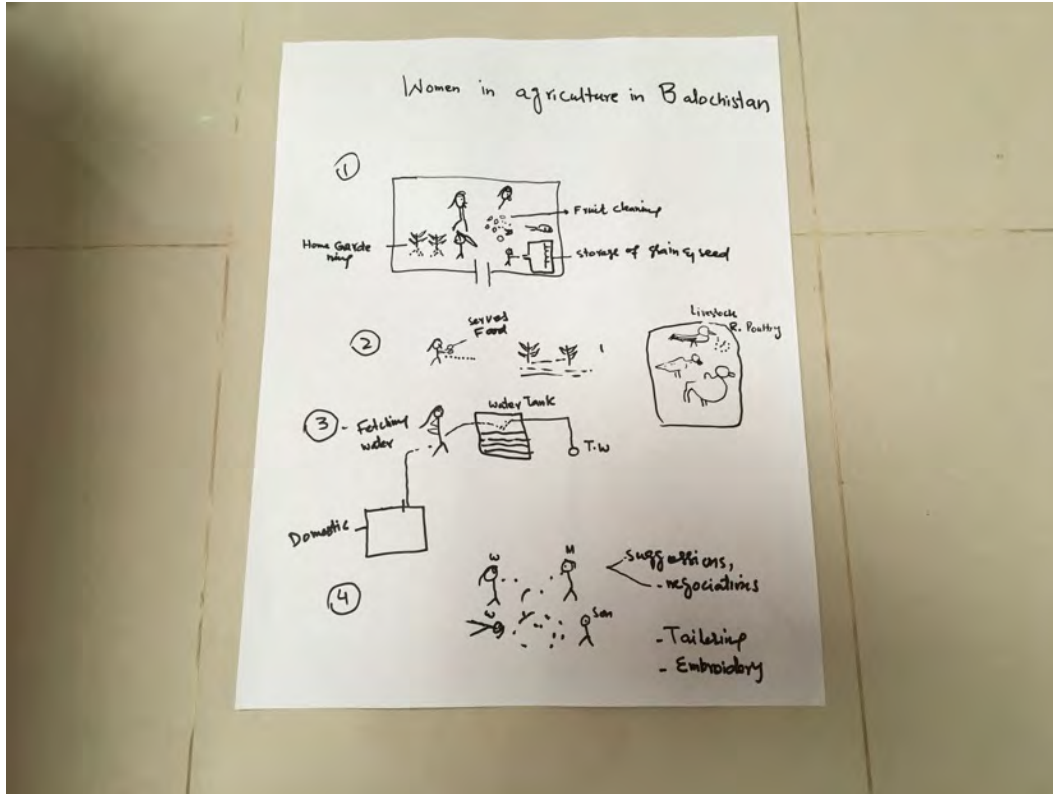
Represent everything about the situation. It is good if people can include themselves in the rich picture.

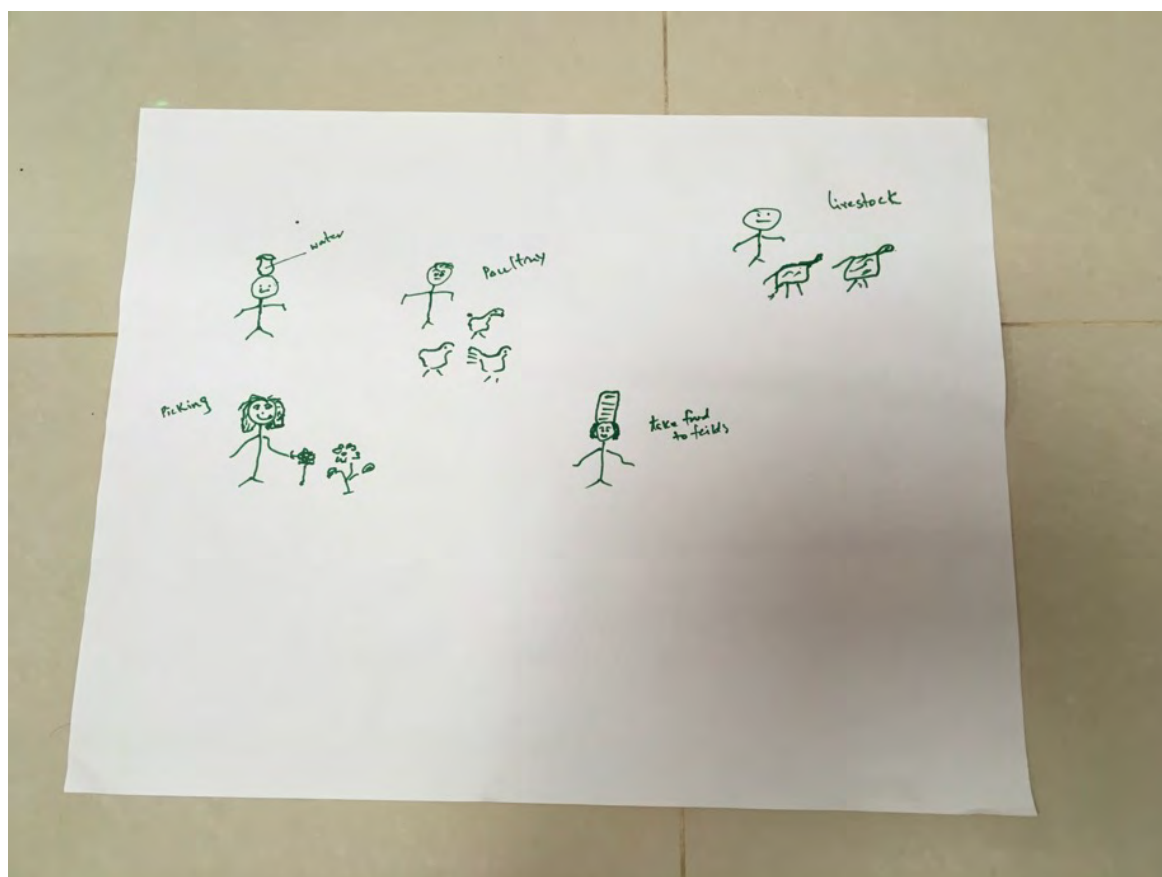
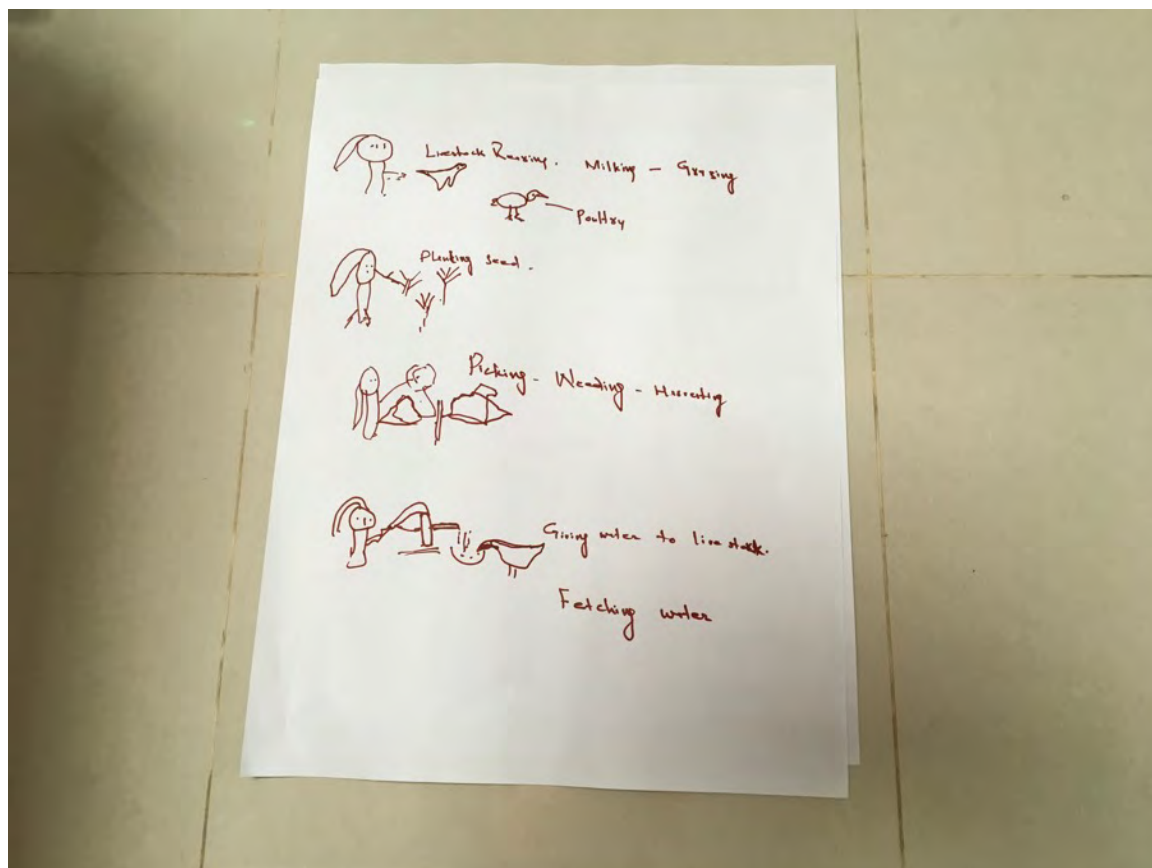
'rules'

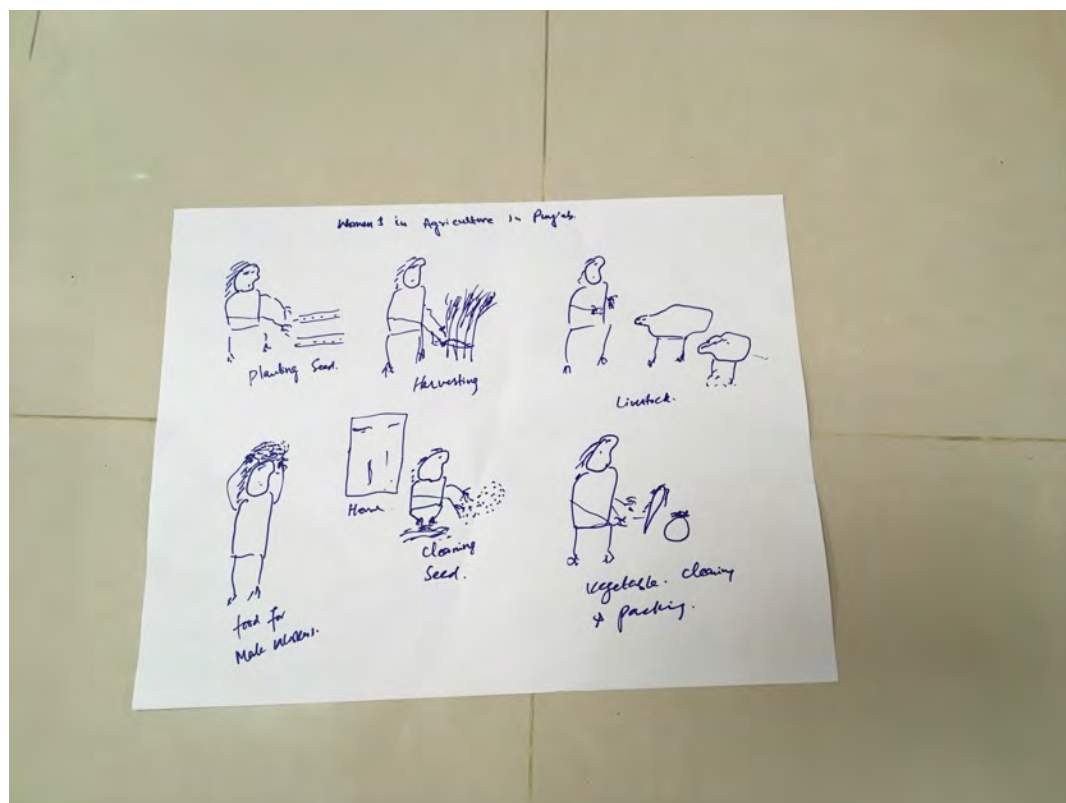
1. don't structure your picture- no metaphor, or overarching them, or time line. Just draw the elements on the page.
2. Don't use too many words or labels
3. Don't exclude your emotions or observations
4. Include a representation of yourself
5. Include a title a rich picture of 'agriculture in x'

People need around 10-20 to draw a rich picture. Then ask people to share their rich picture with a partner. The perhaps place the rich pictures up in a gallery on the walls as an Art gallery/ show and tell to share. Encourage people to add to their own rich pictures as they are guided through the rich pictures of others,

Here's what our rich pictures look like









Rich pictures are an important foundation for exploring the complexity. A few things to note:

- All should have a title, and the title should be what was suggested by the facilitator.
- Try not to rely on labels for things in the picture too much...the verbal sharing of the pictures lets you explain your pictures in more depth than can be conveyed with words on the sheet. Numbers aren't usually needed, as they structure the rich picture.

Identifying themes

A theme is a name that captures a significant part of the rich picture

This rich picture seems to be telling a story about...

There may be a few themes in a rich picture

'Rules'

1. Use no more than two or three words to name your theme. It is a name not a description
2. Don't name the problem
3. Make no judgments
4. Pick themes that appear in several parts of the situation

This early part of the approach is about recognising the messy situation, avoiding mental traps, framing. Themes are one place to start when trying to work with messy situations.

Understanding complex situations

Systems and systems thinking are useful for working with messy situations.

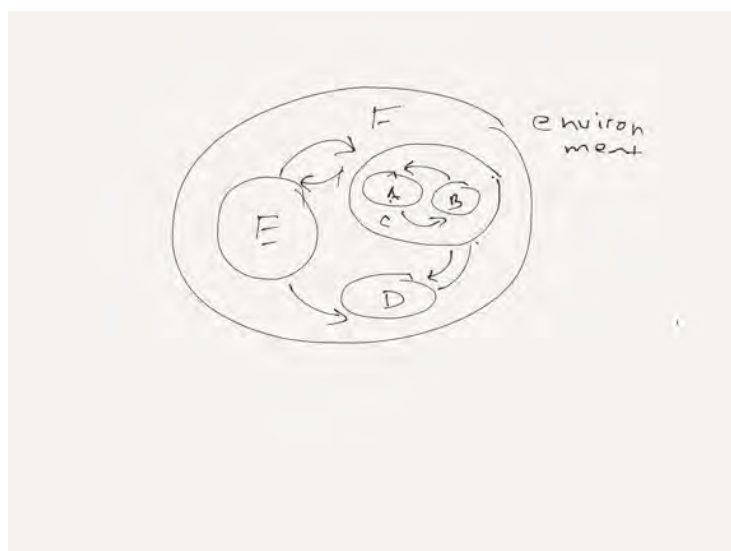
It is hard to define 'system' but try something like this:

A system is something with many parts that does something, that is more than the sum of its parts.

The systems we will be working with here are concepts- they are not like a groundwater model which attempts to show what something really is- the systems we are exploring are something we are creating to help work with messes. They will have grounding in real actions and the world, but even so they are constructed by us. So, it is ok to say that a system has a purpose – this can be by design, or simply by attribution.

I invite you to spend some time reading the section on systems in the book, Chapter 8

The picture below shows a stylised systems map with three sub-systems. One of those subsystems has two sub systems itself. Note that there is a systems boundary, and that the system sits within an external environment.



The idea of a system as a collection of parts that does something is a powerful way of understanding some of the complexity in a messy situation

Snappy systems (that is, quickly labelled systems) is a technique for breaking out of taken for granted understandings of what something is, or what it does



For example, if I consider my home vegetable garden (above) to be a system, I can quickly list a number of descriptions of the garden:

Snappy systems exercise

First discuss my garden

- My vegetable garden is a system to grow food
- My vegetable garden is a system to save money
- My vegetable garden is a system keep the family healthy
- My vegetable garden is a system to use waste produced in the kitchen
- My vegetable garden is a system to provide relaxation
- My vegetable garden is a system to provide exercise
- My vegetable garden is a system to provide satisfaction
- My vegetable garden is a system to try new things to eat
- My vegetable garden is a system to reduce packaging waste
- My vegetable garden is a system to provide a good place for worms, insects and birds

I am not the only person involved in my garden: stakeholders in my vegetable garden include:

- My husband
- Local vegetable suppliers
- Neighbours

By looking at the garden through their eyes I can think of other systems:

- From my husband's perspective: my vegetable garden is a system to keep Catherine happy
- From my neighbours' perspective: my vegetable garden is a system to provide gifts of food
- Local vegetable suppliers: my vegetable garden is a system to deprive them of custom

I can also think about some of the not so good aspects of my vegetable garden, a part of snappy systems called Sinister systems:

- My vegetable garden is a system to take up time
- My vegetable garden is a system to attract snakes
- My vegetable garden is a system to encourage skin cancer

You can see how powerful this exercise is for exploring a situation.

You had a go in the workshop:

Agriculture is a system to...

(name removed)

Agriculture is a system to:

- Provide food, vegetables and fruit for the family
- Provide supplies for market
- Provide self-employment
- Provide employment for the family
- Provide employment for non-farming families
- Provide fodder for livestock
- Provide food, fibre and gas
- Provide wood for furniture and fuel
- Provide oxygen
- Provide homes for birds
- Be part of a supply chain
- Provide raw materials for industry
- Provide agro-tourism

(name removed)

Agriculture is a system to:

- Be the mainstay of the livelihoods of our rural population in Balochistan
- Provide fresh fruit, vegetables and cereals
- Provide food security
- Provide an income
- Maintain climatic conditions of areas
- Provide healthy environments
- Provide healthy livelihoods
- Provides people with job opportunities
- Give rural women duties for health and fitness

(name removed)

Agriculture is a system to:

- Grow healthy food
- Engage farmers in healthy activities
- Save money in a better way
- Invest in for maximum profit
- Involve women in a noble profession
- Get high output from small input
- Provide good mental and physical health
- Enhance soil fertility

- Help us be active
- Benefit farmers and landowners

(name removed)

Agriculture is a system to:

- Continue the profession of our ancestors
- Earn money
- Ensure food security
- Reduce poverty in rural areas
- Enjoy natural environments
- Serve agro-based industries
- Engage input suppliers
- Absorb most of the labour force
- Supply most of the foreign exchange
- Reduce rural-urban migration
- Continue the social cohesion and cooperation in rural areas
- Give esteem and respect

(name removed)

Agriculture is a system to:

- Ensure food security
- Ensure nutrition
- Create strong social bonds
- Create employment opportunities
- Provide shelter
- Promote healthy lifestyles
- Reduce dependency
- Maintain family health
- Provide support for kids' education
- Empower people
- Build strong social bonds among neighbouring communities

(name removed)

Agriculture is a system to:

- Provide food
- Provide employment
- Provide sources of exports
- Provide sources of foreign exchange
- Provide economic stability
- Maintain rural beauty
- Maintain traditions
- Provide agro-tourism
- Support culture
- Use natural resources
- Provide income to invest in other sectors
- Provide raw materials

(name removed)

Agriculture is a system to:

- Feed people
- Clothe people
- Make money
- Store carbon
- Use water
- Make good use of water
- Give people something to do in their life
- Bring people together for a common purpose
- Drive the nation
- Develop the nation
- Engage scientists' expertise
- Enable humans to control nature
- Enable humans to exploit nature
- Create employment
- Keep people busy

I invite you to go further with this exercise and think about the sinister systems of agriculture.

Snappy systems enable us to see some key transformations, or changes, in the messy situation. To do this 'snappy systems' use verbs (action words, use, create...on words) like provide

Another way to explore a system is through a system definition that looks at the following aspects of the system:

- Transformation.....what is changing in the system?
- Would viewwhat are the values that shape the system?
- Owner....who can makes the decisions/can ask for it to be done in this system?
- Customers....who benefits from the system?
- Actors....who does things in the system?
- Guardians.... Who keeps an eye on the system?
- Environment....what are the main influences on the system
- Sub systems.....what are the subsystems of this system?

Note that if you are using this with your group(s) you will probably need to modify the words to suit your people.

Based on our understanding developed from the rich pictures, snappy systems and systems definitions we:

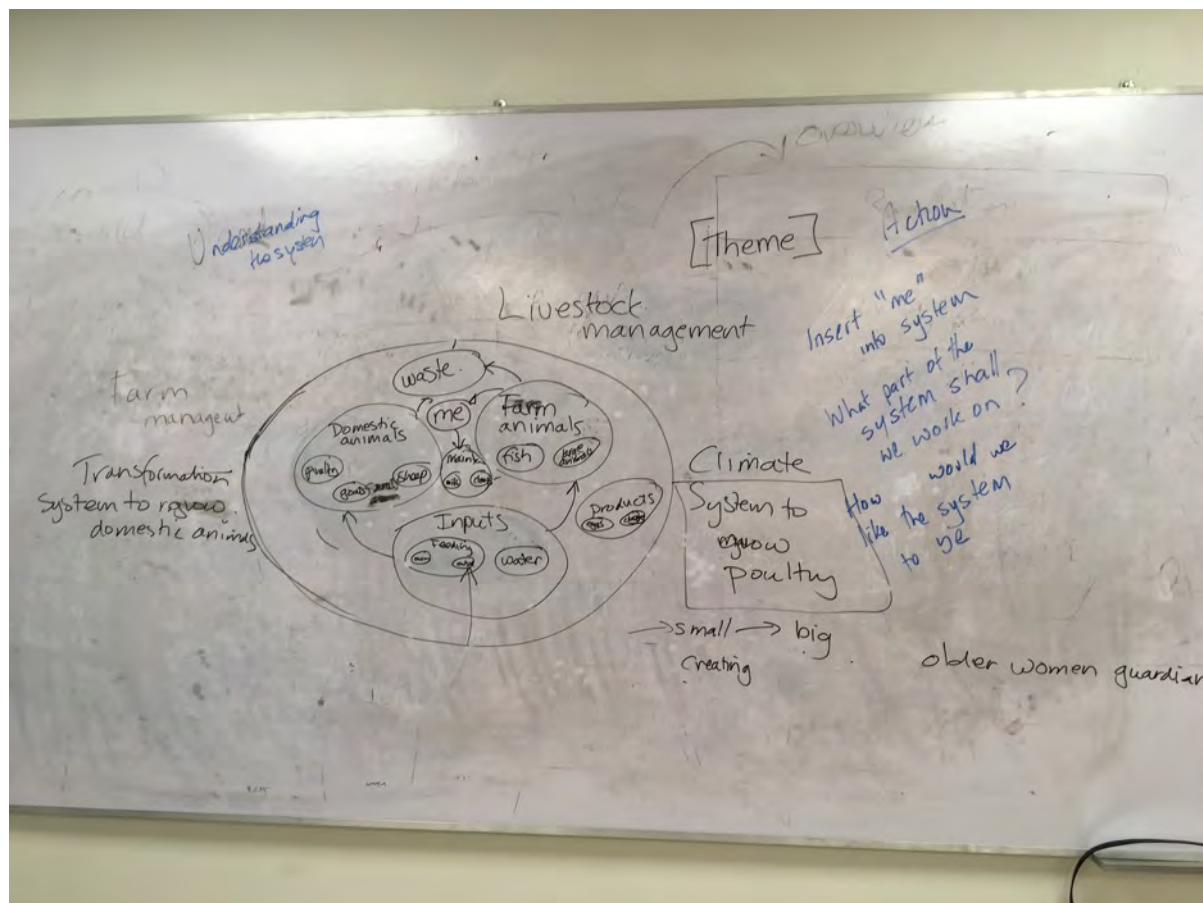
- Let's draw a systems map of women in agriculture
- Start with a theme identified from your rich picture
- List all of the things in the situation that relate to theme (use your rich picture)
- Write each item on a separate sticky note
- Then start putting the things that seem to belong together into systems and sub systems

'Rules'

1. Blob lines represent boundaries
2. Every system and sub system has a name
3. Systems that have an important influence on the system you are mapping are placed outside of the system boundary
4. A title identifying the main system is essential

Most of the benefit of a systems map is in the creating, rather than in the finished product.

We did this as a group, using a theme from some of the rich pictures (a system to grow poultry), to draw a small systems map, that is a sub system of an agriculture system map.



Diagramming is used to further explore the messy situation. There are many forms of diagram but remember that the focus here is on the act of diagramming, rather than on the diagrams themselves. Diagramming is about the interconnections and can be a powerful exploratory and explanatory act.

Eg influence diagram

Multiple cause diagram

[A guide to using diagrams](#)

Planning for a gender focused systemic co-inquires in each province

List of participant categories developed

- Farming women
- Women educators
- Women from Community based organisation
- Educated women
- Young women
- Professional women
- Women extension officers in agriculture and irrigation

Next steps in preparing for the gender systems inquiry workshop:

1. Go through notes of the exercises we've provided today and Catherine's notes
2. Look at the youtube clip (above)
3. Read the book
4. Come up with a design for the workshop – what tools will you use and in what order?
5. How many workshops will you run, and what activities will you do?
6. Start planning for the pilot workshops in March
7. Build your facilitation team
8. Who you will bring to the pilots and to the (later) workshops?
9. How will you invite participants to enthuse them to come?
10. What resources will you need?

Catherine will:

- Contact you in early December to set up an adobe connect meeting to discuss your pilot inquiries
- Send you some papers to show this process in action

9 Appendix 2

Notes from the co-inquiry workshop November 10, 2017, MUET

Introductions

Seher-un-nisa, Saira Akhtar, Anam Akram, Khadija Batool, Munzah Perveen, Perveen Akhtar, Asif Kamran, Mahreen Alam, Muhammad Zeeshan, Ahmad Zeeshan Bhatti, Michael Mitchell and Catherine Allan

Difficulties and messes

We did an exercise to distinguish difficulties from messes

- 4) Think of something that you have to sort out as part of work or home, something that you know you will be able to do, even if it will take some effort. (Saira's example was sorting out some procedures in her Department)
- 5) Now, think of something that you are working on that you have been struggling with for a while, but that you cannot really see what to do or where to start. (Saira's example was balancing the needs of work and family)
- 6) Now, consider whether these are the same sort of thing, and if not what makes them different?

The issues in the first category could be called difficulties- they are not necessarily simple, but you can tackle them with a plan of clear steps. The issues in the second categories might be called messes, messy situations, or wicked problems. They need a different approach from linear step by step approaches.

Difficult situation	Messy situation/ uljhan
Can be resolved/ finished	Is ongoing
Can be understood	Hard to understand
You know where to start	Hard to know where to start
	Involves emotion

This workshop introduced you to systems thinking as one possible approach for working with messy situations.

We are working on the assumption that tackling issues of gender and groundwater in Pakistan is a messy situation, rather than simply a difficult situation.

The gender co-inquiry in the groundwater project

- We want to bring women together to explore gender aspects of groundwater management.
- We think gender in groundwater management is a messy situation so systems thinking and tools may help
- The different tool is that we are not **asking people what they need** but enabling a process where **they can see if there is something they can do together**.

This workshop

- discuss an overall framework for the gender co-inquires
- practice some of the activities that you could use to facilitate the co-inquiry
- begin to plan the gender co-inquires in each province.

Overall framework for the gender co-inquires

There is no set procedure or steps for co-inquiry- it is an approach, rather than a method.

Rose Armson's book *Growing Wings on the way* sets out a general approach that considers:

- Engaging with complex situations
- Understanding complex situations
- Exploring purposeful action in complex situations
- Inquiring through action

(Siara has a copy for Punjab)

Engaging with complex situations

Start with trying to understand the complexity of the situation. A good way to do that is by using

Rich pictures

Rich pictures are 'rich' because they have detail and lots of things going on in them. It is rich like a good fruit cake is rich.

Individuals draw their own rich picture of the given situation

Use a large sheet of paper and a thick pen if possible

Represent everything about the situation. It is good if people can include themselves in the rich picture.

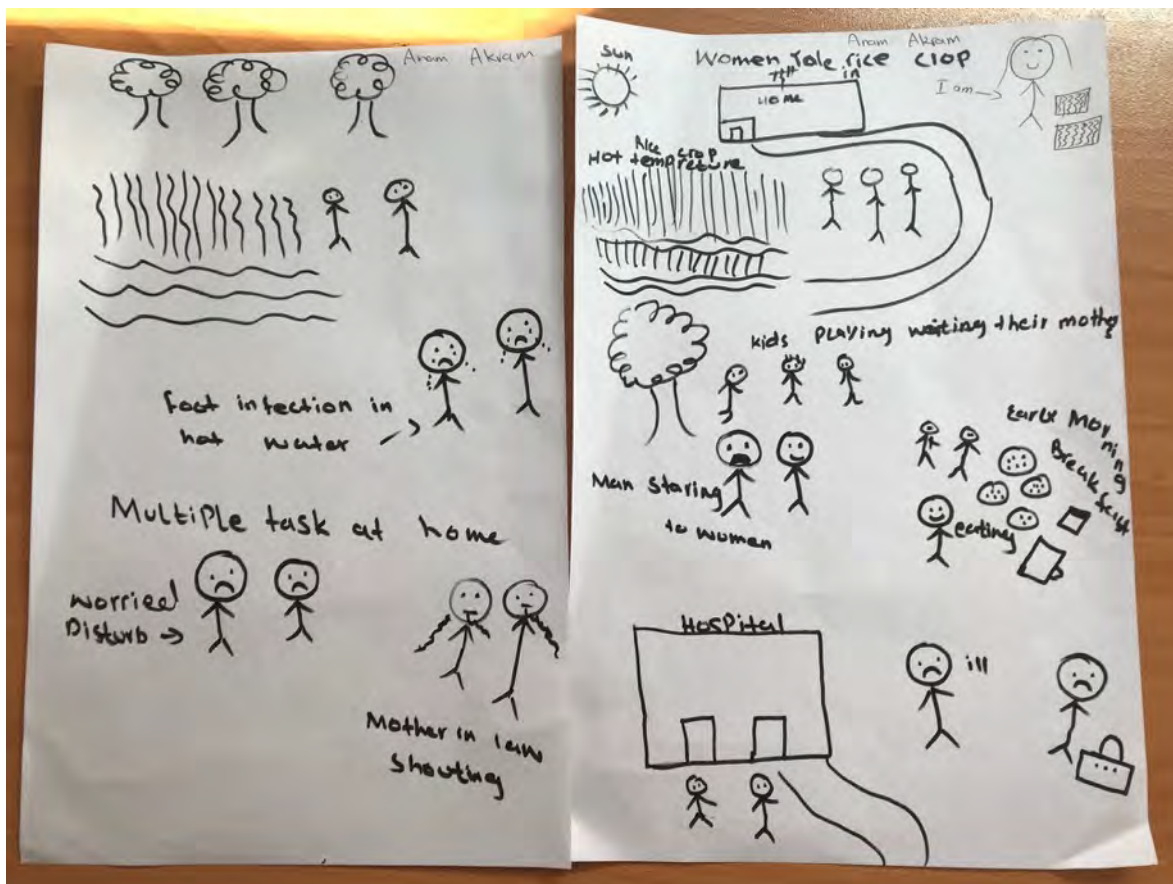
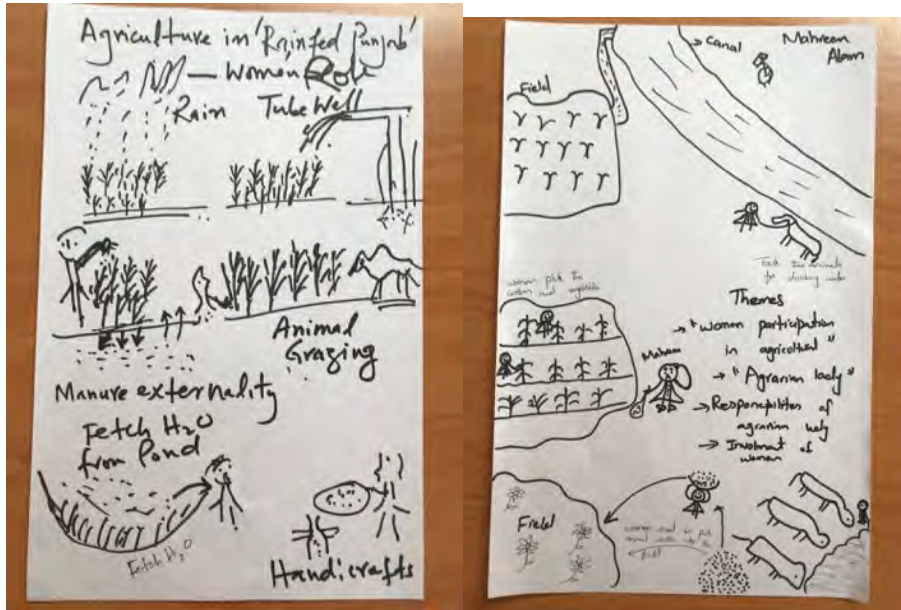
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1. don't structure your picture- no metaphor, or overarching them, or time line. Just draw the elements on the page.
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5. Include a title a rich picture of 'agriculture in x'

People need around 10-20 minutes to draw a rich picture. Then ask people to share their rich picture with another person in the group (that is first one, then the other, discuss their rich pictures together). The perhaps place the rich pictures up in a gallery on the walls as an Art gallery/ show and tell to share. Encourage people to add to their own rich pictures as they are guided through the rich pictures of others.

Sometimes it is then helpful to draw a group rich picture

Here's what our rich pictures look like









Rich pictures are an important foundation for exploring the complexity of a situation. A few things to note: all rich pictures should have a title, and the title should be what was suggested by the facilitator. Try not to rely on labels for things in the picture too much...the verbal sharing of the pictures lets you explain your pictures in more depth than can be conveyed with words on the sheet. Numbers are not usually needed, as they structure the rich picture.

We discussed why pictures can be useful for this sort of 'brainstorming' exercise. Here is what you said

- Pictures can be unstructured
- Pictures are understandable
- There is involvement from the heart
- It's quicker
- It's fun
- Better retention
- We think in pictures/ we are visual people
- They can have more detail
- They create conversation between different types of people

Identifying themes

A theme is a name that captures a significant part of the rich picture

This rich picture seems to be telling a story about...

There may be a few themes in a rich picture

'Rules'

1. Use no more than two or three words to name your theme. It is a name not a description
2. Don't name the problem
3. Make no judgments
4. Pick themes that appear in several parts of the situation

This early part of the approach is about recognising the messy situation, avoiding mental traps, framing. Themes are one place to start when trying to work with messy situations.

Some themes you identified in your rich pictures were:

- Work
- Working in the fields
- Life
- Being ignored
- Responsibility
- Involvement
- Accessing water
- Harassment

Understanding complex situations

Systems and systems thinking are useful for working with messy situations.

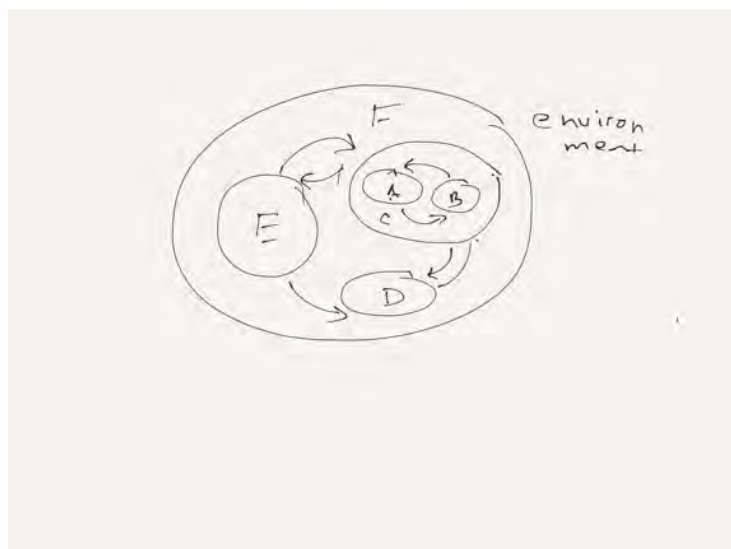
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I invite you to spend some time reading Chapter 8, the section on systems in the book,

The picture below shows a stylised systems map with three sub-systems. One of those subsystems has two sub systems itself. Note that there is a systems boundary, and that the system sits within an external environment.



The idea of a system as a collection of parts that does something is a powerful way of understanding some of the complexity in a messy situation

Snappy systems (that is, quickly labelled systems) is a technique for breaking out of taken for granted understandings of what something is, or what it does.

Snappy systems exercise



For example, if I consider my home vegetable garden (above) to be a system, I can quickly list a number of systems to help understand my garden:

- My vegetable garden is a system to grow food
- My vegetable garden is a system to save money
- My vegetable garden is a system keep the family healthy
- My vegetable garden is a system to use waste produced in the kitchen
- My vegetable garden is a system to provide relaxation

- My vegetable garden is a system to provide exercise
- My vegetable garden is a system to provide satisfaction
- My vegetable garden is a system to try new things to eat
- My vegetable garden is a system to reduce packaging waste
- My vegetable garden is a system to provide a good place for worms, insects and birds

I am not the only person involved in my garden: stakeholders in my vegetable garden include:

- My husband
- My neighbours
- Local vegetable suppliers
- Neighbours

By looking at the garden through their eyes I can think of other systems:

- From my husband's perspective: my vegetable garden is a system to keep Catherine happy
- From my neighbour's perspective: my vegetable garden is a system to provide gifts of food
- Local vegetable suppliers: my vegetable garden is a system to deprive them of custom

I can also think about some of the not so good aspects of my vegetable garden, a part of snappy systems called Sinister Systems

- My vegetable garden is a system to take up time
- My vegetable garden is a system to attract snakes
- My vegetable garden is a system to encourage skin cancer

You can see how powerful this exercise is for exploring a situation.

You had a go in the workshop:

An agricultural community is a system to.....

- An agricultural community is a system to feed the country
- An agricultural community is a system to provide crops seasonally
- An agricultural community is a system to provide fodder for livestock
- An agricultural community is a system to provide employment for unskilled labour
- An agricultural community is a system to provide raw material for industries (eg cotton)
- An agricultural community is a system to support urban societies
- An agricultural community is a system to invent new practices
- An agricultural community is a system to help the economy
- An agricultural community is a system to maintain nature
- An agricultural community is a system to provide physical exercise
- An agricultural community is a system to progress the country
- An agricultural community is a system to keep minds healthy
- An agricultural community is a system to earn foreign exchange
- An agricultural community is a system to improve the environment
- An agricultural community is a system to show the simplicity of life
- An agricultural community is a system to use waste materials

We added some stakeholders and looked for their perspectives through snappy systems:

Urban communities

- An agricultural community is a system to get food
Farmers (both men and women)
- An agricultural community is a system to make money
Industrialists
- An agricultural community is a system to make money

I invited you to go further with this exercise and think about the sinister systems of agriculture.

Sinister systems

- An agricultural community is a system to hold people back
- An agricultural community is a system to entrench injustice
- An agricultural community is a system to worsen health
- An agricultural community is a system to make urban people 'parasites'
- An agricultural community is a system to deplete resources (water, soil)
- An agricultural community is a system to maintain rigidity eg of power relations

Snappy systems enable us to see some key potential transformations, or changes, in the messy situation. To do this 'snappy systems' use verbs (action words, use, create...on words) like provide.

We were going to move on to drawing a systems map based on either a theme, or on a snappy system., but did not have time or energy. We will look at this in our first on-line meeting in December.

In the meantime, I encourage you to think about a variety of other ways to use diagrams to explore and explain messy situations. There are many forms of diagram, but remember that the focus here is on the act of diagramming, rather than on the diagrams themselves. Diagramming is about the interconnections and can be a powerful exploratory and explanatory act.

Eg influence diagram

Multiple cause diagram

[A guide to using diagrams](#)

We finished by looking ahead to:

Planning for a gender focused systemic co-inquires in each province

List of participant categories developed

- Farming women
- Young women
- Skilled women
- Influential women
- Women farm labourers
- Educated women in the village and from other villages

- Nurses
- Doctors
- Women in NGOs
- Women in agriculture department and irrigation extension

Next steps in preparing for the gender systems inquiry workshop:

1. Go through notes of the exercises we've provided today and Catherine's notes
2. Look at the youtube clip (above)
3. Read the book
4. Come up with a design for the workshop – what tools will you use and in what order?
5. How many workshops will you run, and what activities will you do?
6. Start planning for the pilot workshops in March
7. Build your facilitation team
8. Who you will bring to the pilots and to the (later) workshops?
9. How will you invite participants to enthuse them to come?
10. What resources will you need?

Catherine will:

- Contact you in early December to set up an adobe connect meeting to discuss your pilot inquiries
- Send you some papers to show this process in action

And a little something I read in today's Dawn

<https://images.dawn.com/news/1178878/this-woman-defied-stereotypes-to-become-a-rickshaw-driver-and-found-financial-independence>



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