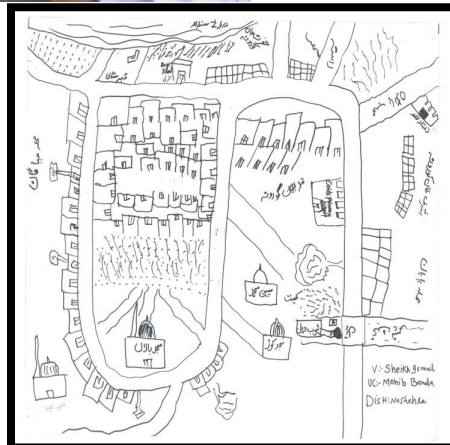




Islamic Relief

Women Farmers' Perceptions about Climate Change and Adaptation in Khyber Pakhtunkhwa (KPK), Pakistan



October 2011

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1. INTRODUCTION

1.1. Background of the Study

Climate change is the defining human development challenge of our time. It threatens to stall poverty reduction and hard-earned progress made in achieving the MDGs. It requires knowledge, skills and resources to adapt to the changing climate. In the countries of South Asian region, including Pakistan, the early signs of climate changes are already threatening the lives and livelihoods, health and well-being of millions, especially the poor and vulnerable, who lack the financial, technical, human and institutional resources to adapt.

Future changes in precipitation, incidence of extreme events, sea level and glacial cover are expected to affect food security, nutrition, and access to water, sanitation, shelter, health, labor productivity, productive sectors and household incomes. These changes may exacerbate the already low levels of human development in the region.

In the backdrop of the above mentioned scenario, this study is an effort to address the issues related to the impact of the climate change on some of the vulnerable areas of Khyber Pakhtunkhwa (KPK) province of Pakistan, with an intention to redevelop some strategic mechanism for community-based adaptation processes to reduce the negative impact of climate change and to protect the people living in more vulnerable areas.

1.2. Objectives

The main objective of the study was to investigate the impact of the climate change on the farming communities and to assess the Community-based Climate Change Adaptation Responses and Methods adopted by the affected communities of the 4 selected districts of Khyber Pakhtunkhwa (KPK) province of Pakistan. The findings of the study would help in developing community-based strategies and policies to address the impact of the climate change and to reduce its negative impact on the people of these areas.

1.3. Locale of the study

The study was conducted in the 16 villages of the 4 selected districts of the Khyber Pakhtunkhwa (KPK) province of Pakistan. These districts were selected on the basis of their location, which is always exposed to natural disasters and calamities, like heavy rains, floods and earthquakes.

In-Depth-Interviews were conducted with the selected male and female members from all the 16 villages, while PRA activities were conducted only in 3 selected villages of 2 districts, including Charsadda and Nowshehra.

1.4. Methodology and Research Tools

A number of research methods, including Literature Review, Visits to relevant organizations, Focus Group Discussions (FGDs) and Participatory Rural Appraisals (PRAs), were applied for data collection.

Following research tools were prepared and used for data collection:

- Check list for Focus Group Discussions (FGDs)
- Check list for PRAs

1.5. Research Team

A combined research team of external consultants and Islamic Relief Pakistan field staff, Mardan, was constituted and trained for conducting this study.

1.6. Duration of Study

The planning, field work and report writing tasks of the Study were completed in 4 weeks time.

1.7. Data collection from Research Organizations

A number of relevant organizations working on the climate change and its impact were visited for discussions and collection of secondary data to plan the study and also to use that for comparative purposes and to cross-check and verify and validate the findings of this study.

Some of the visited institutions and research organizations include:

1. Pakistan Agricultural Research Council (PARC), Islamabad
2. National Agricultural Research Centre (NARC), Islamabad
3. Global Change Impact Assessment Research Institute, Islamabad
4. Ministry of Environment, Islamabad
5. Metrological Department, Islamabad
6. Agricultural Research Centre, Turnab, KPK
7. Cereal Crops Research Institute, Peer Sabaq, Nowshehra

2. FINDINGS OF THE WOMEN FARMERS' PRA ACTIVITIES

2.1. Rationale and Aim of the Use of PRA Methods

This study has been conducted by adopting multidisciplinary approach and applying multiple methods for data collection and its analysis. PRA is one of the approaches and methods which are used to interact with the community and to collect in depth qualitative information on socio-economic and demographic issues existing in any society.

Some of the PRA methods used in field included Stakeholders Analysis; Venn diagram and Mapping of Institutions and Systems Diagram; Time Line Charts and Historical Maps and Time Trends; Water Use Mapping and; Mapping of Problems related to livelihood; Preference Ranking Charts; Pie Charts; Social Mapping; History Diagrams; Disaster Histogram and techniques like Transect Walk.

These methods helped to record the changing trends with respect to climate change and its impact on life and livelihoods of the communities. The study focused on finding out the vulnerabilities of the affected population and the coping and adaptation strategies, which have been used by the affected communities or those which could be adopted to minimize the effects of future disasters. The study also probed the major problems, their root causes, and the effect of climate change and also assessed the coping capacities of local communities to recommend a way forward to avert the impact of this phenomenon on socio economic conditions of the local population.

PRA activities were conducted with both - male and female community members, in the selected villages. Each group comprised of 15 to 20 community members. In each village, the male and female research team members spent one day to complete the PRAs.

2.2. Locale of the PRA Activities

Randomly three villages out of the IRP project area were selected to conduct the PRAs. The emphasis was given on the selection of the disaster-affected and vulnerable areas. The details of the selected villages are given below:

1. Village Zarra Miayana of UC Peer Sabaq, District Nowshehra,
2. Village Manzooray of UC Aagra, district Charsdah, and
3. Village Banda Sheikh Ismail of UC Mohib Bandah, district Nowshehra.

2.3. Village Zara Miana

2.3.1. Profile of Village Zara Miana

Village Zara Miana, is situated in Peer Sabaq Union Council of district Nowshehra. It consists of 7 hamlets, with 2000 Households, having total population of 9000, including 4700 males, 4300 females and 3500 children. There is one boy's primary and one middle school, one girl's primary school and one middle school in the village. There are 9 mosques and 4 madrassa,s (3 for males & 1 for females) in the village.

2.3.2. Women Farmers' PRA in Zara Miana

Social Mapping

In order to understand the social and economic contexts of the village communities, women farmers' group was asked to prepare a Social Map of their village to identify the main features and available facilities, services and resources in their village and also in the surrounding areas. And those facilities and services were drawn on the ground clear surface as well as on charts by the staff.

According to the participating women, the village has facility of primary and middle schools for girls as well as for boys. There are total 9 mosques in the village; Zara Miana is divided in 7 muhalla (hamlets). Village is rich in terms of agricultural farms and cropping technology and practices.



Figure 1: Social Map Drawn by the Female Group



Figure 2: Females involved in PRA Activities

Rainfall time line chart

The participants have had productive discussions around the subject and shared their memories with references to describe their observations regarding the rainfall situation during the 1960 to 2000 and 2001 to 2010 time periods. Some of the major observations narrated by the group are given below, while detailed comparative analysis of both the periods (1960 to 2000 and 2001 to 2010), has been given in the following Table 1.

- Hailstones and flash rains during last 15-20 years have been decreased;
- Rain fall frequency and number have decreased;
- Rain fall intensity has also decreased;
- Extreme rain fall has been observed in "Pashaka" month (Mid-July – Mid-August) of the year, but a little bit decrease has also been observed in rain fall with the passage of time.
- Respondents revealed that due to rear rain fall in May & June, the season is mostly dried and causes shortage of fodder for livestock and their milk production is reduced due to that shortage.

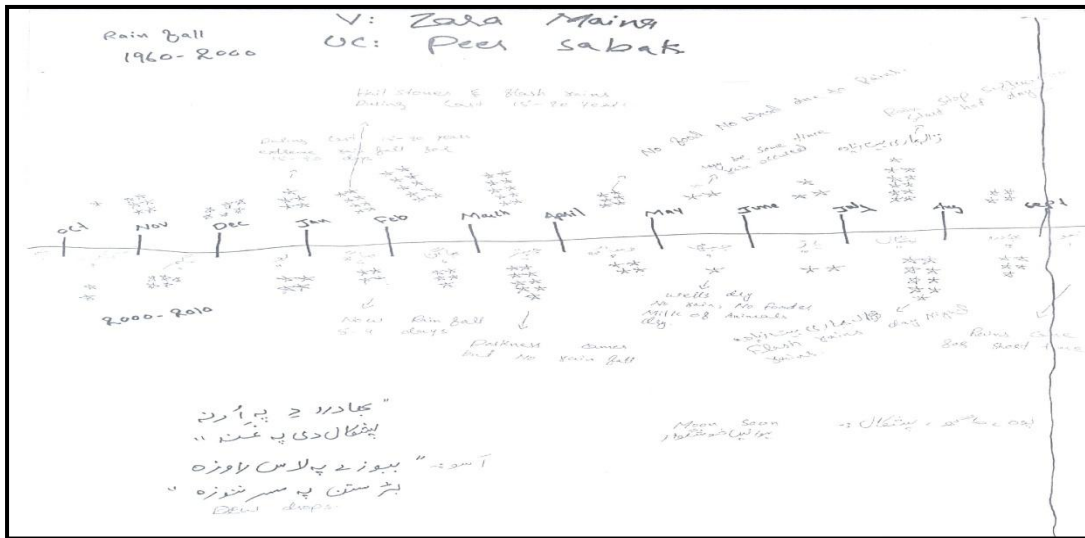


Figure 3: Rainfall Chart ZaraMyana

Table 1: Comparative Chart of Rain Fall during the Periods 1960 – 2000 versus 2001 – 2010

Time Period 1960-2000		Time Period 2001-2010	
Months	Changes Recorded	Months	Changes in recorded
October	Usually in natural process rain fall	October	Average rainfall for last decade.
November	Three-four average rainfall	November	Three rainfall average.
December	Rain fall extremely, hail stone with rain fall and intensive rain fall (cats and dog) observed	December	Rain fall number as well as intensity decreased observed, hailstones and flash rain decreased observed comparing last 10 years before 2000 but sometime dramatically intensity of rain fall increased.
January	Extreme rain fall high intensity but comparably less rain falls than December.	January	Intensity of rainfall has decreased as well as frequency during last ten years.
February	Average Three-four rainfall (rain fall on time)	February	It is called month of rains and it starts falling by mid of the month.
March	Four-five pleasant rainfall	March	Rainfall starts from March again
April	Three-four pleasant rainfall	April	Rain fall ends in April with periodic decrease in intensity.
May	In first 30 years some time heavy rainfall observed. But rain fall number reduced observed with time.	May	Rainfall has decreased to great extent
June	Three-two rainfall at end of the month	June	Three low intensity rainfall observed
July	Richest with respect to rainfall. It started to fall rain in first week and intensity used to go on increasing. Normally floods were witnessed in this month.	July	Heavy rainfall, high intensity, extreme number of rain fall, during last 10 years decreased observed, 2010 was the worst.
August	Three-four rainfall recorded.	August	Three rainfalls, observed, intensity has increased.
September	In last 30 years the rainfall was witnessed in this month but since then it has decreased, two or three rainfall average.	September	two average rainfall

Temperature change Time-line chart

Female participants were asked different questions about temperature changes, changes in summer season, winter season, and monsoon and spring seasons during last 20-30 years. Then a time-line chart of months was drawn and female's observation about temperature changes for different seasons of (1960-2000) & (2000-2011) were recorded.

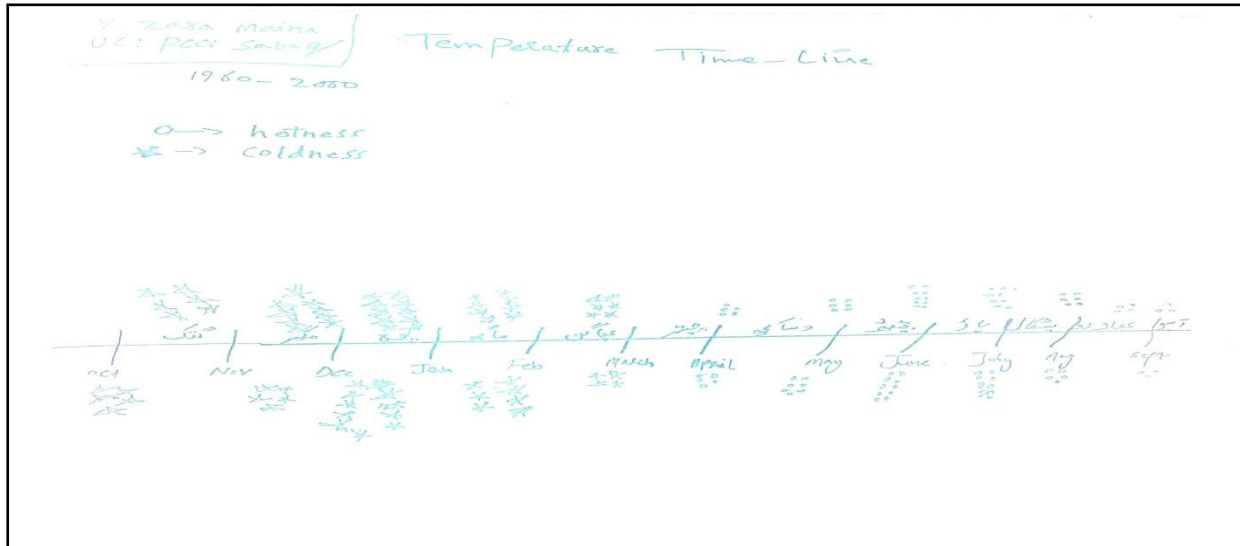


Figure 4: Temperature Chart Zaramiana

A summary of main observations has been given below:

- It was observed that hotness has increased to some extent during last 10 years;
- Humidity has increased because of rain fall decrease;
- December and January were recorded as the extremely cold months of the year but intensity of coldness has decreased as observed during last 10 years;
- According to females' observation June & July months were hot and humid, they have also revealed that during last 10 years hotness and humidity is on extreme.

Some more details about the Temperature Changes as reported by women during the discussion have been presented in the following Table.

Table3: Comparative Changes in Temperature during the Periods 1960 – 2000 versus 2001 – 2010

	Time Period 1960-2000		Time Period 2000-2010	
Time Period	Months	Temperature Status	Months	Temperature Status
1960-2000	October	Coldness of winter starts	October	Previous 20-15 years coldness reduces to normal
	November	Cold weather	November	Cold weather starts in November
	December	Extremely cold(2-3 pairs of soaks)	December	Extremely cold
	January	Extremely cold	January	Extremely cold (less as compare last 10 to 15 years)
	February	Cold weather	February	Less cold than previous month

	March	End of winter and was observed less cold than previous quarter.	March	Normal with increasing heat over time
	April	Pleasant	April	Pleasant but comparably hot as it was during last 20 years
	May	Pleasant with less hotness	May	Hot weather
	June	Extremely Hot	June	Extremely hot
	July	Extremely Hot	July	Hot and humid
	August	Hot day but nights pleasant	August	Hot weather
	September	Sun hot in the day but nights were cold	September	Hot and Humid day, pleasant nights

Cropping Pattern and Changes

Mostly resident of area depends on agriculture outputs. Sugar cane, wheat, maize, rice and mustard are main crops of the area; while, sugar cane, maize and wheat are main source of farm income. For the fodder needs mostly grasses, maize and “*shaftal*” were cultivated. Sugar cane and Yam cropping period was reported as 12 months and for wheat six months. Some of the old crops have been discarded in the village and a few new crops, such as tomatoes, have also been introduced. Summary of the key findings has been given below:

- Forage cropping during last 10-15 years has been discarded, while, a new crop of tomato has been introduced.
- Sugar cane, maize, wheat, yam and potatoes are more productive crops of the area.
- Maize crop is sown twice a year: spring crop (fodder) and kharif crop.

Livestock Management trends

Livestock was reported as the main source of income in village. Some of the main findings are as bellow:

- During last 20 years home remedies were used at home, since veterinarian services were not available.
- Mostly females used at home different types of self made drinks for animal’s treatment and herbs were also used.
- They hire private veterinary physician for animals treatment now a day’s most of the times.
- Treatment of common diseases during last 10-15 years were home remedies mostly (by mustard oil, herbs, turmeric, ‘*gurr ka sharbat*’, “*ajwayen*”, “*kabab*”)
- But now since 2000, both methods: doctor and self treatment were in use.

Some more details of the information collected with respect to diseases in livestock and their remedial measures are given in the following Table.

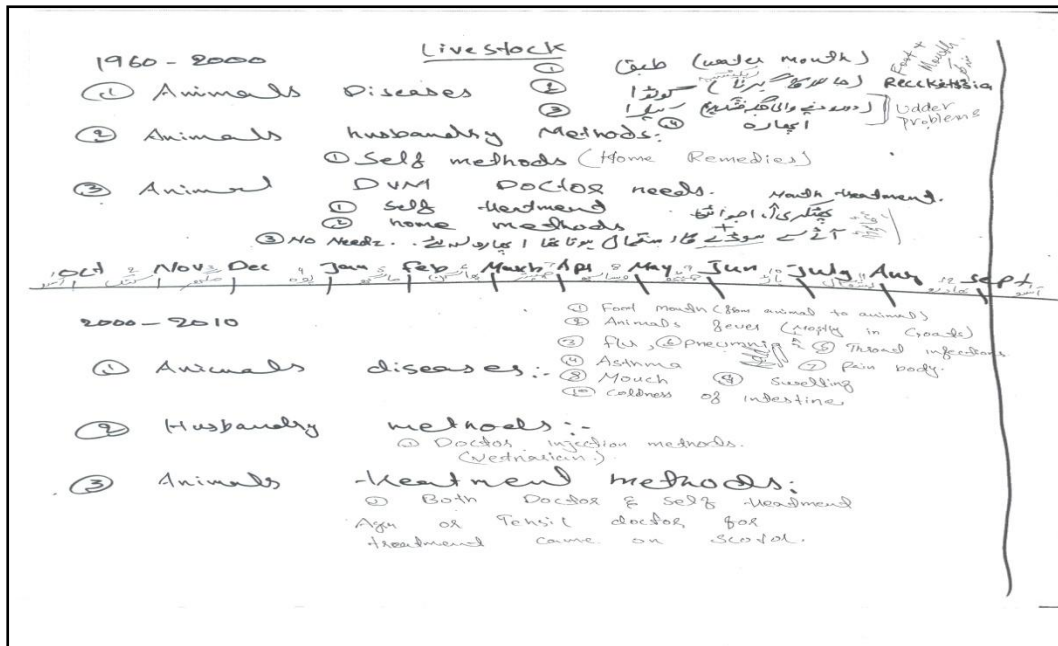


Figure 5: Livestock Management and Diseases Village Zaramiana

Table4: Showing Comparative State of Livestock Diseases and Treatments Used

Time period	Disease	Remedial measures
(1960 – 2000)	Foot mouth (Mou Khur)	Indigenous methods were used by the women. Veterinary services were not available at large and were considered injurious for the livestock. Medicinal herbs and plants were used to cure the disease.
	Rickettsia (Gotwa)	
	Swelling	
Husbandry methods		Home remedies were in practice
(2000-2010)	Foot mouth (from animal to animal)	Referred to private or Government veterinary services as well as home remedies.
	Animals fever, flu, throat infection (mostly in goats)	
	Intestine problems and disturbance in metabolism	
Husbandry methods		Veterinarian

History of floods

To draw a Time-line chart of Floods from 1910-2000, females were asked about the occurrence of floods. They reported that major floods were observed after 1950 and one that of 2010, while minor floods were recorded as: first after 1970, second in 1990s and third one in 2007. The findings of the discussion revealed that normally floods occurred in the month of “Pashka” (June- July).

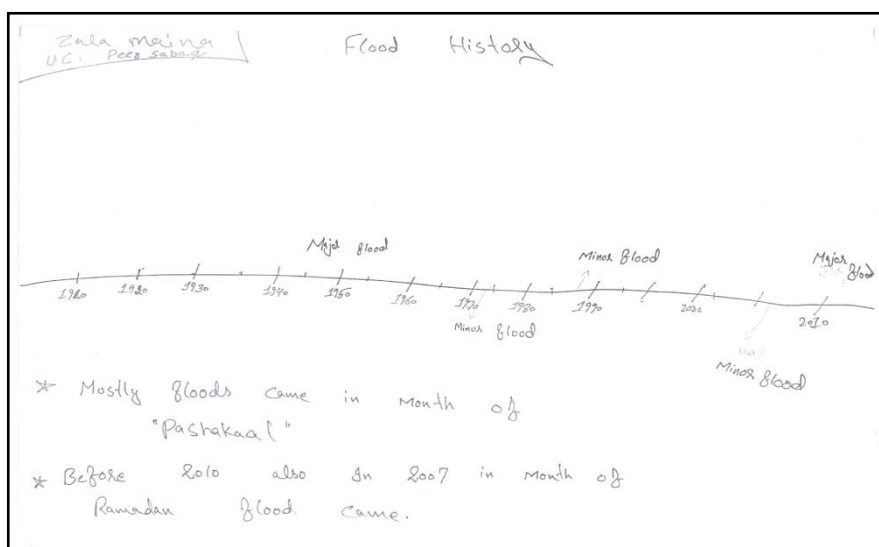


Figure 6: History of Floods

Experience of women in camps – Post floods 2010

Women were probed about the suffering during the flood and in the post-flood periods, using the Recall Technique, to record the problems and hurdles that they faced in the aftermath of 2010 floods, while they were displaced to the camps. The synthesis of the discussions is presented in the following Table.

Table5: Sufferings caused during the Post-Flood Period in 2010

Problems Faced	Diseases
<ul style="list-style-type: none"> • We were mentally disturbed. • Families were living nearby graveyard in tents. • They had limited access to latrines. • For bathing and washing mostly they were going to relative homes for shower. • Children were disturbed and unhappy. 	<ul style="list-style-type: none"> • Skin infections • Scabies observed in camps • Bacterial infections • Roughness of skin • Diarrhea and cholera • Stomach problems • Depressions • Flu and fever.

Community strategies or adaptation to respond these disasters in future

It was observed that the women have now knowledge about the disaster preparedness because of their experiences in 2010 floods. But except that they were using the pessimist approach and said that “God will save us in the future”. Though they were sensitized about the floods and its consequences but they do not know how to cope with it in the future.

2.4. Village Manzoori

2.4.1. Profile of Village Manzoori

Village Manzoori is situated in north–west of Charsadda city at a distance of 8 kilometer. It is a riverside village located on the right bank of River Swat locally known as “*Khiali Sindh*”. The total area of the village is 3 square kilometers. In 2010 floods the complete village was badly hit by the flooded and was silted up to five feet high level. Local population of 993 individuals, 138 household was displaced and underwent severe damages to their livelihoods.

2.4.2. Women Farmers’ PRAs in Manzoori

Social Mapping

Following the participatory approach of the PRA, after having the introduction with the female participants, they were encouraged to draw a map of their village, using the available materials on the ground. The same was later replicated on the chart for record.

The social map reflects the divide in the village in terms of hamlets, available services, mosques, infrastructure, agricultural land and facilities. The information reflected on the map reflected that the village is divided into four small hamlets named *Manzoory Korona*, *Thanday Kornoa*, *Koper Korona* and *Khiali Korona*. There are two mosques in the village.

The only irrigation channel was damaged is being restored by Islamic Relief. Village has no health facility and community has to visit Gul Abad BHU and district headquarters hospital. Locally constructed five facilities are available to crush the sugarcane and produce the “*Gurr*”. Village has two primary schools one for boys and other for girls.

Rainfall time line chart

The respondent females had an average age of 55 years with rich memories of the past. In order to record the rainfall patterns since 1960, the historical diagramming technique was used. The participants have had productive discussions around the subject and shared their memories with references.

Summary of the reported information and discussion based on the trends analysis reflects that during last 20-30 years, the rainfall pattern has changed; stormy rain fall and rain fall with hailstones

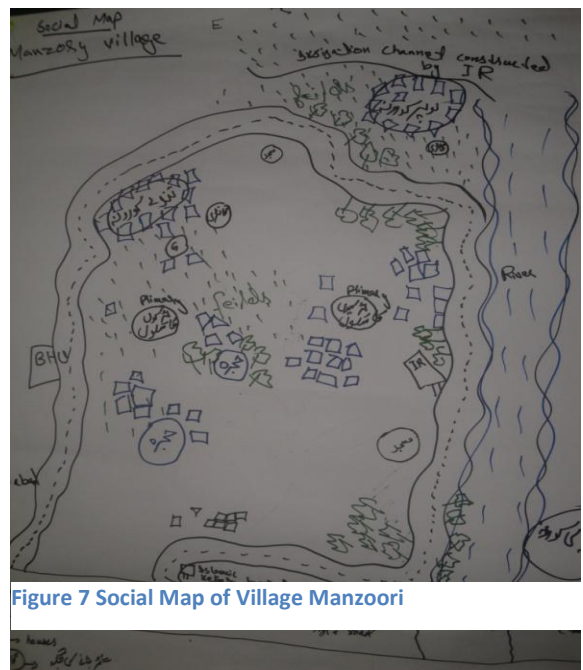


Figure 7 Social Map of Village Manzoori

has decreased. As compared to the past, hailstones and intensive flash rain fall have reduced in the months of December and January. Female group had a consensus that since 2000, the rainfall has really decreased with drastic changes in the pattern. In was disclosed that the rain fall intensity and frequency decreased a lot during last 10-15 years.

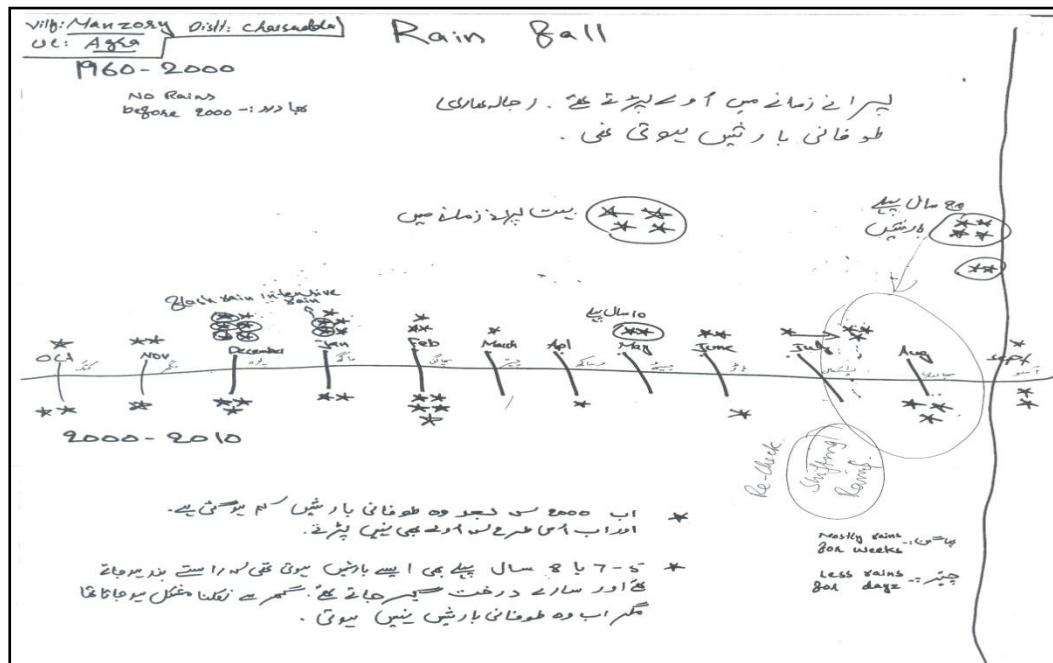


Figure 8: Rainfall Chart Village Manzoori

Some more details about the Rain Fall changes have been presented in the following Table.

Table 7: Comparative Chart of Rain Fall during the Period 1960 – 2000 versus 2001 – 2010

Time Period 1960-2000		Time Period 2001-2010	
Months	Changes Recorded	Months	Changes in recorded
October	Rain falls in the month (Average two)	October	Average rainfall for last decade.
November	(two or three) Rainfall	November	Two rainfall
December	Extreme rainfall (Intensity high, mostly hailstone with rain fall. Flash raining observed mostly)	December	Rain fall number as well as intensity decreased observed, hailstones and flash rain decreased observed comparing last 10 years before 2000 but sometime dramatically intensity of rain fall increased.
January	Extreme rain fall (high intensity but comparably less than December)	January	Intensity of rains has decreased as well as frequency during last ten years.
February	Rain fall(average two-three, rain fall on time)	February	It is called month of rains and it starts falling by mid of the month.
March	Pleasant rainfalls (two-three average)	March	Rainfall starts from March again
April	Two-three pleasant rainfall	April	Rain fall in April with periodic decrease

			in intensity.
May	In first 30 years some time heavy rainfall observed. But rain fall number reduced observed with time.	May	Rainfall has decreased to great extent
June	two-three rainfalls at end of the month	June	Two or three low intensity rain falls observed
July	Richest with respect to rainfall. It started to fall rain in first week and intensity used to go on increasing. Normally floods were witnessed in this month.	July	Heavy rainfall observed with high intensity. 2010 was the worst.
August	Two-four rainfalls recorded.	August	Two-three rain falls observed but intensity has increased.
September	In last 30 years the rainfall was witnessed in this month but since then it has decreased to two-three rainfalls.	September	One or two rainfalls

Temperature change Time-line chart

The purpose of this exercise was to record the trends in the temperature as observed by the local community. It was reported that over last 15-20 years, December was the season with extreme cold weather condition. The received information revealed that the intensity of climate has comparatively decreased. Similarly November and February were experienced to be cold for last 20 years but the trend shows that the intensity of the cold has decreased. In these two months extreme fog has been recorded with very low visibility during the day time.

The trends over last decade reflect that the weather conditions in September have become harsh and temperature has considerably increased in the month which happened to be colder in the past.



Figure 1 Females are busy in drawing Temperature Chart

In the following table some more information collected during the course of exercise has been presented.

Table 8: Comparative Temperature Changes reported for the Periods 1960 – 2000 versus 2001 – 2010

Time Period 1960-2000		Time Period 2001 – 2010	
Months	Temperature Status	Months	Temperature Status
October	Hotness end cold weather start	October	Previous 20-15 years coldness reduces to normal
November	Cold weather	November	Cold weather starts in November
December	Extremely cold	December	Extremely cold
January	Extremely cold	January	Extremely cold (less as compare last 10 to 15 years)
February	Extremely cold	February	Less cold than previous month
March	End of winter and was observed less cold than previous quarter.	March	Normal with increasing heat over time
April	Pleasant	April	Hot weather starts
May	Pleasant with less hotness	May	Hot
June	Extremely Hot	June	Extremely hot
July	Extremely Hot	July	Hot and humid
August	Hot in the day but nights were cold	August	Hot weather
September	Hot in the day but nights were cold	September	Hot and Humid day with pleasant nights

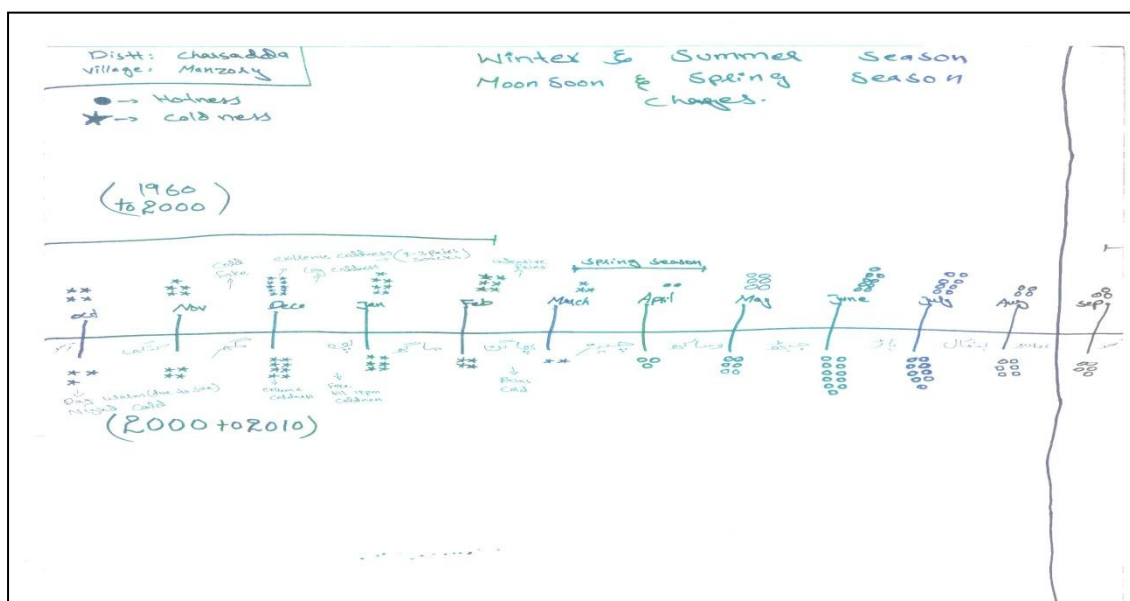


Figure 2: Seasonal and Temperature Changes in Village Manzoori

Cropping Pattern and Changes

Agriculture is the mainstay of livelihood for the local communities. Wheat, maize, sugarcane and rice are the mostly grown crops. There are two cropping seasons Rabi (winter) and Kharif (summer). In Rabi wheat is grown and in Kharif Maize, Rice and Sugarcane are sown. Some farmers also grow seasonal vegetables for commercial use. Seasonal gross, wheat and maize straws are used as fodder for the animals.

It was told by the female community members that over the years the difference in sowing and harvesting times of the crop has been disturbed with the variance of two weeks. Production of main crops has reduced whereas the production of some vegetables like yam and potatoes has increased. Tobacco and sunflower were planted 10-15 years ago but now have been totally avoided by the farmers due to low productivity. Similarly rice is being grown at a limited scale. During the last years, before 2000, the production was more comparably but now varieties have increased but production has decreased.

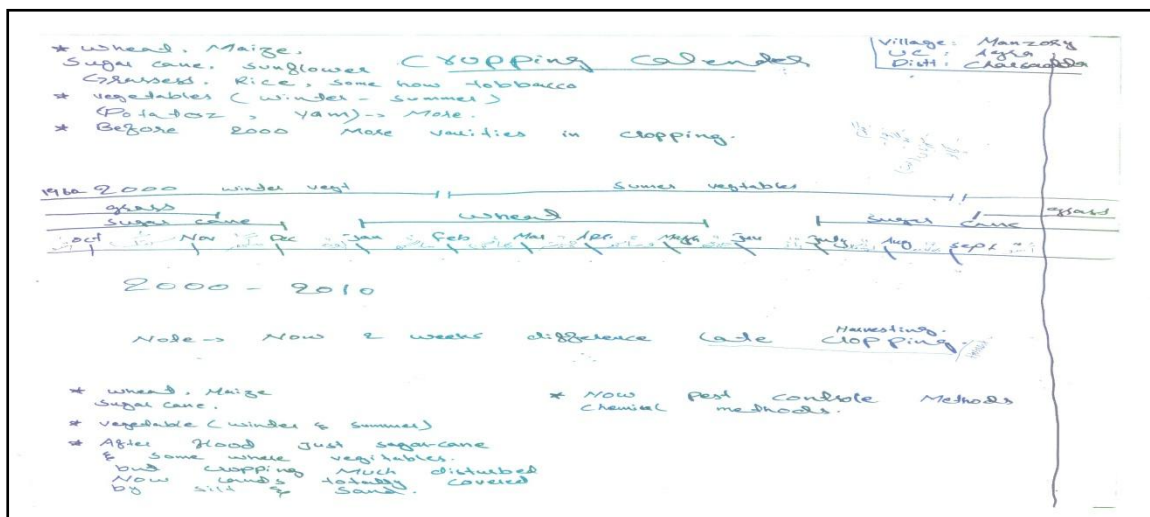


Figure 3: Cropping Chart Village Manzoori

Livestock Management trends

Mainly, women keep the livestock and are responsible for managing them at the household level. Over the years they have carried the indigenous knowledge about diseases and local remedial measures adopted. It was also observed that with the changing trends and times the indigenous knowledge and practices have been reduced, whereas, the new diseases have been introduced. The main findings include:

- It was found that over the years the trend has changed where people refer to the veterinary services when the animal is suffering with a disease. The indigenous practices have almost reduced. The medicinal herbs and home remedies use for livestock diseases has decreased.
- For the animal husbandry the veterinarian is consulted.
- New fodder species like sorghum, feed supplements and minerals were introduced over a decade or so.
- The locally available fodder, wheat straws, forage, grass, maize silage and maize straws are still used.

The synthesis of the information collected with respect to diseases in livestock and their remedial measures is given in the following Table.

Table 9: Comparative Livestock Managing Trends during Periods 1960 – 2000 versus 2001 – 2010

Time period	Disease	Remedial measures
1960 – 2000	Foot mouth (<i>Mou Khur</i>)	Indigenous methods were used by the women. Veterinary services were not available at large and were considered injurious for the livestock. Medicinal herbs and plants were used to cure the disease.
	Rickettsia (<i>Gotwa</i>)	
	Udder problems (<i>Kaila</i>)	
	Swelling	
Animal Husbandry methods		Home remedies
(2000-2010)	Foot mouth (from animal to animal)	Referred to private or Government veterinary services as well as home treatment.
	Animals fever, flu, throat infection (mostly in goats)	
	Pneumonia	
	Asthma	
	Intestine problems and disturbance in metabolism	
Animal husbandry methods		Veterinarian

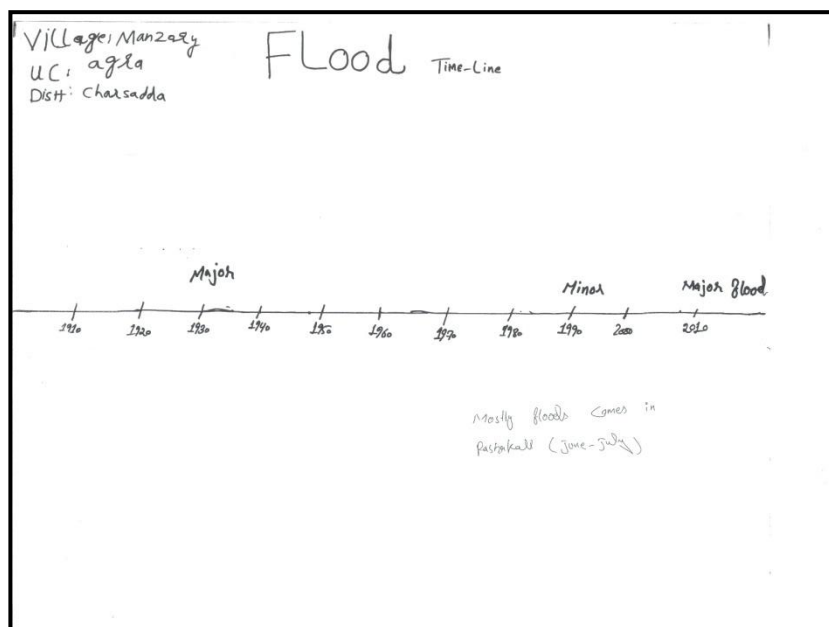


Figure 4 Figure 5: Flood Time Line Chart Village Manzoori

History of floods

While using the probing and recall technique the group of females was asked about the occurrence of floods. The findings of the discussion revealed that normally flood occurred in the month of “Pashkaal”, (June –July) but it was low in intensity. There was not a major flood for last 60 years in this part of the province.

Experience of women in camps – Post floods 2010

Women were probed about the suffering using the recall technique to record the hurdles they faced in the aftermath of 2010 floods while they were displaced to the camps. Women can recall the suffering that they faced in the aftermath of 2010 floods and consider it horrible time of their life.

The synthesis of the discussions is presented in the following Table.

Table 10: Problems faced by the Women in Post Flood Period

Problems Faced	Diseases	Protection Issues
<ul style="list-style-type: none">• Mentally disturbed• Families were scattered• Limited access to latrines, bathing and washing places.• Children were traumatized and were vulnerable to abuse and abduction.• During the rescue through helicopters many women nails were plucked out.	<ul style="list-style-type: none">• Skin diseases• Scabies were observed in camps• Children had diarrhea and cholera• Malaria and typhoid was observed• Diseases increased after the floods even when they have come back the village.	<ul style="list-style-type: none">• Men were not accompanying the families and women felt unsafe.• They had not privacy.• Had to interact with the men who were not known to them.• They could not visit the doctor.• They could not take bath and go to latrines in the camps.• They were unable to wash clothes.

Community strategies or adaptation to respond these disasters in future

Detailed discussion was held with the women using the probing method and appreciative approach. When asked about the damages of the floods and adaptation strategies to mitigate their impact, the responses gathered were as following:

- Floods demolished the standing crops of maize and sugarcane in 2010.
- After the floods the land was covered with the silt and wheat crop could not be planted at large scale during Rabi season 2010.
- Since the water was not available so the production of sugarcane and vegetable has gone down.

It was observed that the women have now knowledge about the disaster preparedness. They were using the pessimist approach and said that “God will save us in the future”. Though they were sensitized about the floods and its consequences but did not know how to cope with it in the future.

2.5. Women farmers' PRAs in the Village Banda Sheikh Ismail

2.5.1. Village profile

Village Banda Sheikh Ismail, is located in Union Council Pabbi is situated in district Nowshehra. It consists of 5 hamlets or muhallas(muhalla bala, muhalla payan, white mosque muhalla, mian gaan muhalla, irshad qilla and hazrat jaan korona). The village has 950 House Holds having total population of 7000. There are primary, middle and high school facility available for boys and girls. There are 5 mosques (white mosque, Bala mosque, Payan mosque, Bilal mosque, MianGaan mosque). This village is known as a 'vegetable area', where, vegetables are cultivated on large scale for commercial purposes and produce is marketed in Peshawar, Nowshehra and Pabbi markets. The village has lot of potential for the cultivation of the off-season vegetables and for Plastic Tunnel agriculture. Marketing – gardening linkages establishing needs are seriously felt by the farmers.

Beekeeping was being done on a large scale before 2010 floods but during floods the bee farms were totally destroyed and needs revival. It was a value chain business. Beekeepers Association also exists in the village.

2.5.2. Banda Sheikh Ismail

Social Mapping

The social map prepared by the females reflects the divide in the village in terms of hamlets, available services, mosques, infrastructure, agricultural land and facilities.

- There are primary, middle and high school facility available for boys and girls.
- Six muhalla in village (muhalla bala, muhalla payan, white mosque muhalla, mian gaan muhalla, irshad qilla and hazrat jaan korona).
- Health services BHU is available in a nearby village of Banda Mulla Khan and in the District Headquarters Hospital, Nowshehra.

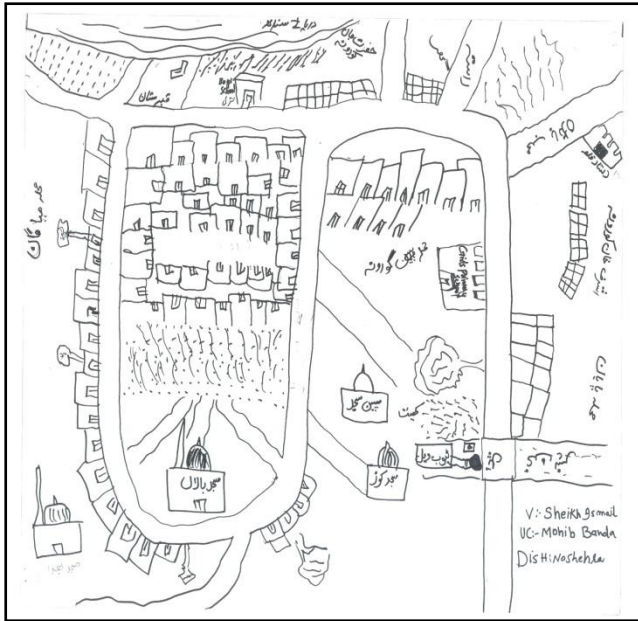


Figure 6: Social Map of Village Banda Sheikh Ismail

Rainfall time line chart



Rain fall time-line chart drawn by females' indicates the following main changes that have occurred in the area during last few decades.

Over all comparing rain fall changes during last 20-30 years it was recorded that recently rainfall has decreased in numbers.

We also observed that intensity of December

Figure 7: Women in PRAs

and January rain fall decreased since last 10 years.

There were intensive and frequent rainfall observed once in last 20 years in the month of June that was wheat harvesting days. Wheat harvest was badly affected and wheat grains grew up in the fields.

June July rich rain fall "pashakal" month but decrease observed in rain fall intensity and number during last 10-15 years in this month.

Some more details as reported by the female group have been presented in the following Table.

Table 12: Comparative Chart of Rain Fall during the Periods 1960 – 2000 versus 2001 - 2010

Time Period 1960-2000	Time Period 2001-2010
-----------------------	-----------------------

Months	Changes Recorded	Months	Changes in recorded
October	Rain fall (three-four average)	October	Same rain fall for last decades
November	Rainfall average three-four	November	More rain fall then October, three rainfall average.
December	Extreme rainfall. Rain fall intensity high and mostly hailstone with rain fall. Flash raining observed mostly, high rain fall number and high intensity then February and January rain fall.	December	Rain fall in number and intensity more all over the year, but decrease observed both number and intensity as comparing with last 15-20 years
January	Extreme rain fall high intensity but comparably less rain falls than December.	January	Extreme rain fall but intensity of rains has decreased as well as frequency during last ten years. Darkness and clouds more but rainfall less
February	Rain fall mostly three-four at end of month rain fall mostly increases (rain fall on time)	February	It is called month of rains and it starts falling by mid of the month (average three)
March	Four pleasant rainfalls mostly at end of month	March	Rainfall starts from March again, month of rain fall
April	Pleasant rainfall observed (five-six)	April	Rain fall ends in April with periodic decrease in intensity.
May	Rain fall (average five-four)	May	Rainfall has decreased to great extent
June	One or two rainfalls at end of the month In first 30 years some time heavy rainfall observed that wheat seeds re cropped in field. But rain fall number reduced observed with time.	June	Three low intensity rain falls observed
July	Rain fall month It started to fall rain in first week and intensity used to go on increasing. Extreme rainfall, Normally floods were witnessed in this month.	July	Heavy rainfall number observed with high intensity. 2010 was the worst.
August	Start of month rainfall recorded, average 3-4 rain fall	August	Two-three rainfall observed but intensity has increased.
September	In last 30 years the rainfall number witnessed in this month more but since then it has decreased to two or three rainfalls.	September	One or two rainfall

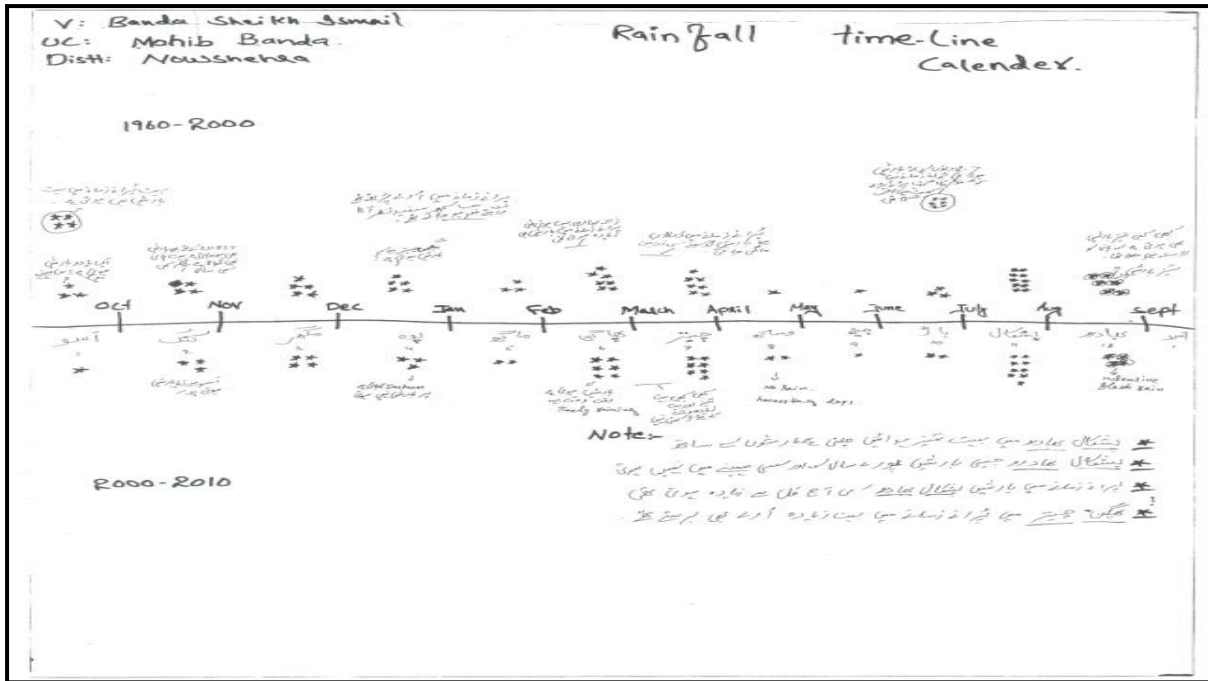


Figure 14: Rainfall Calendar Banda Sheikh Ismail

Temperature change Time-line chart

The main findings on the Temperature Changes indicate that:

- It was observed that hotness has increased to some extent during last 10 years.



Figure 8 Females preparing Temperature Change Time Line Chart

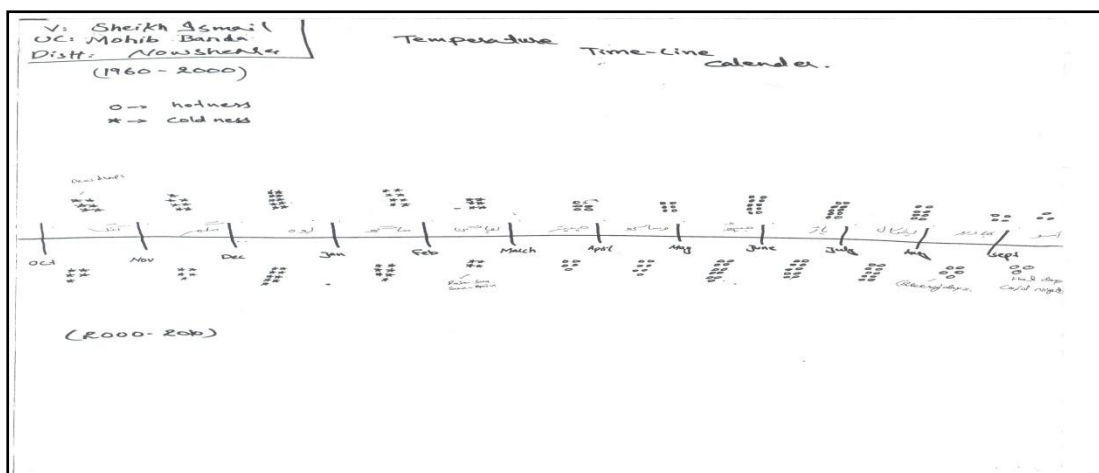


Figure 9: Temperature Chart drawn by women

- Humidity has increased because of rain fall decrease.
- December and January were recorded as extremely cold months of the year but intensity of coldness has decreased during last 10 years.
- According to females’ observation June and July months were hot and humid, they revealed during last 10 years hotness and humidity was on extreme.

Some more findings are presented in the following Table.

Table13: Comparative Weather Conditions of two Time Periods: 1960 – 2000 versus 2001 – 2010

Time Period 1960-2000		Time Period 2001-2010	
Months	Temperature Status	Months	Temperature Status
October	Coldness of winter starts	October	Previous 20-15 years coldness reduces to normal
November	Cold weather	November	Cold weather starts in November
December	Extremely cold(2-3 pairs of soaks)	December	Extremely cold
January	Extremely cold	January	Extremely cold (less as compare last 10 to 15 years)
February	Cold weather	February	Less cold than previous month
March	End of winter and was observed less Cold than previous quarter.	March	Normal with increasing heat over time
April	Pleasant	April	Pleasant but comparably hot as it was during last 20 years
May	Pleasant with less hotness	May	Hot weather
June	Extremely Hot	June	Extremely hot and humid
July	Extremely Hot	July	Hot and humid
August	Hot day but nights pleasant	August	Hot weather
September	Hot in the day but nights were cold	September	Hot and Humid day, pleasant nights

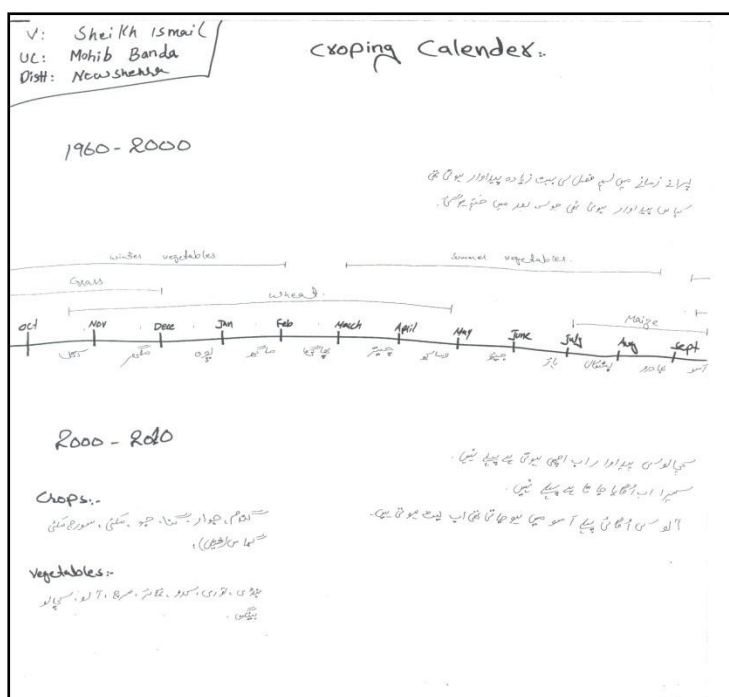


Figure 10: Cropping Calendar

Cropping Pattern and Changes

Resident community of village was mostly agriculture- dependent and most of them were farmers from their fore fathers. Sugarcane, wheat, maize, forage and sunflower are main crops of area. Nowadays sugar cane, maize and wheat are main source of income in crops. For the fodder need mostly grasses, maize and "shaftal" were in cropping practices. San (local cotton) has been discarded now, whereas, some vegetable crops have been introduced during last 10 years, such as, cucumber and bottle gourd. Some of the key findings on the cropping pattern are:

- San (local cotton) was the only listed discarded crop during last 10-15 years from the area.
- Some new vegetable crops have been introduced in the area such as cucumber.
- It was recorded from female's views that varieties of crops have increased during last 10-15 years.
- Now different types of crop- seeds were available in the markets.
- In past years potatoes and yams were cultivated on small scale but its production was more but nowadays these are cultivated on large scale but as compared to past their production is less.
- If crop sowing is not done on proper time than that affects the production.

Livestock Management trends

The synthesis of the information collected with respect time periods of 1960-2000 & 2001-2010, diseases in livestock and their remedial measures, animal husbandry methods have been given in the following Table:

Table 14: Comparative Livestock Managing Trends during Period 1960 – 2000 versus 2001 - 2010

Time period	Disease	Remedial measures
(1960 – 2000)	Foot mouth (<i>Mou Khur</i>)	Indigenous methods were used by the women. Veterinary services were not available at large and were considered injurious for the livestock. Medicinal herbs and plants were used to cure the disease.
	Rickettsia (“ <i>Gotwa</i> ” neck swelling) mostly summer season	
	Swelling, fever	
Husbandry methods		Home remedies were in practice
(2000-2010)	Foot mouth (from animal to animal)mostly cold season	Referred to private or Government veterinary services as well as home remedies.
	Rickettsia (“ <i>Gotwa</i> ” neck swelling) mostly summer season	
	Animals fever, flu, throat infection (mostly in goats)	
	Intestine problems and disturbance in metabolism	
Husbandry methods		Veterinarian and home remedies

Some of the key findings regarding the livestock management include:

- Common livestock diseases were foot mouth, Rickettsia, swelling etc before last 30 years and still diagnosed mostly but change has been observed during last 10 years and introduction of new disease for example different type of infections, fever, flu etc, has been observed.
- Treatment during last 20 years were totally home remedies mostly herbs, homemade medicines and drinks used for different treatments.
- Mostly for husbandry treatment home remedies were in process and during last 10-15 years husbandry methods by consulting veterinarian as well as home remedies were used.
- From the first it was observed that animals fodder needs were mostly fulfilled from different crops remaining as well as fodders were cropped for livestock during those months when it was in need and the process is same till date.

History of floods

It was observed that floods were witnessed mostly in month of “*pashaka*” (June-July). Minor and major floods were recorded during last 80 years in these months. Females told about their memory about flood history. According to them before 25 years one major flood was witnessed and other major flood was witnessed before 80 years. Both were the worst floods recorded and except them one minor flood was recorded 5-6 years ago.

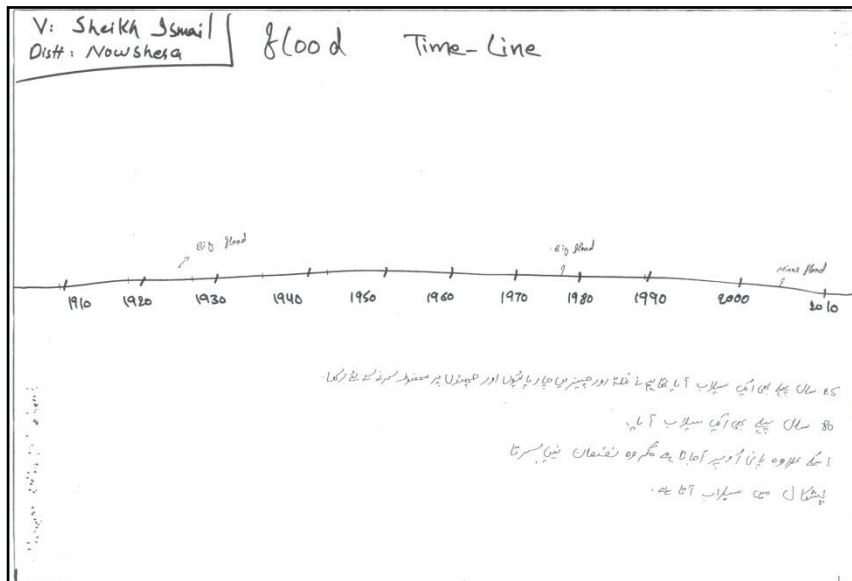


Figure 18: Flood Line Chart

Experience of women in camps – Post floods 2010

Females told about their camp experiences, which were much tenable. They rescued their lives by walking out, by swimming out and large number of females was rescued through boats. Some residents of village stayed on roofs of their homes for long time. Village people during flood saved their lives in camps of *taro*, *balo*, *tarkha*, *khush maqam* and *ali shah khan*. In camps they got relief - they were living, they were eating, but it was hectic. Females told that they were in trouble, uneasy and disturbed a lot. They recorded that people back to village after months; it was observed families returned back after 8 months as well.

Table: Problems faced by the Female in Camps during Post-Flood period

Problems Faced	Diseases
<ul style="list-style-type: none"> Females were disturbed, were in trouble. They had limited access to latrines, bathing and washing places. Horrible time they were facing. 	<ul style="list-style-type: none"> Skin diseases Scabies were observed in camps. Eyes infections Fungus and bacterial infections Children had diarrhea, motions, vomiting, fever and cholera Malaria and typhoid was observed mostly.

Women can recall the suffering that they faced in the aftermath of 2010 floods and consider it horrible time of their life.

Community strategies or adaptation to respond these disasters in future

Females answered during probing that disasters are from GOD side and May GOD help us. It was observed that the women have no knowledge about the disaster preparedness. They were using the pessimist approach and said that “God will save us in the future”. Though they were sensitized about the floods, its consequences but did not know how to cope with it in the future.

3. RECOMMENDATIONS

Women farmers' analysis leads us towards the following conclusions and recommendations. It was found that women farmers were aware of their local climate and the changes in the recent past. These climate changes have also led in changes in livelihoods options without having any knowledge support and systematic analysis of different livelihoods options available. There were hardly any institutions, women farmers believe, that they can rely on for getting climate related information. Thus, there is very little information available to them that can help them adapt their livelihoods decisions to the changing climate.

1. Climate Change Education and Awareness.

- In the entire flood affected, villages especially such as Manzoori, which are located on the riverside, the women and children were seriously hit by the flood damages. Special measures are needed to educate and aware the children and women to safeguard them from the future floods.
- People of the area have very little awareness about climatic change and its impacts and risks. There is a need to provide them knowledge about climatic changes and their impacts.

2. Disaster Risk Reduction and Management

- Community-based self help measures and mechanisms are needed to safeguard lives and properties before the disasters. Risk management and reduction measures should be introduced among the affected communities, with particular emphasis on women and children needs.
- Communities need education and support to design and construct flood resistant houses on the higher and safer locations.
- Community-based local early warning systems could help reduce the losses. Local Imams and school teacher should be involved in education and for early warnings and announcements through mosques and schools for alerting people about flood threats.

3. Adaptation of Food Production Systems

- It was found that temperature and rainfall changes result in serious adaptation in food production systems as it alters production environment. New crops are added in and some crops have been dropped from the system. As the climate change requires adaptation in production technologies, public and private institutions need to adapt their research and extension agenda to the changing climate.
- Local and provincial governments need to make strenuous efforts to take the climate related information to the farming communities, particularly women farmers.
- Public sector departments and NGOs should introduce new initiatives to help farmers reclaim water logged soils.
- Women farmers, with little training and support, can adapt their vegetable production systems that can sustain minor floods. Development NGOs can help women farmers in this regard.

4. Food Security During Emergencies

- Women farmers' felt the need to construct safer and better grain storage bins in the houses and other safer community places. Construction of small shelters on the roof tops of schools and mosques can help store adequate food during the emergencies.
- It was found that women farmers' faced a great deal of difficulties to feed the livestock that they could save from the floods. Provision of dry feed/ration for the livestock could have saved the precious livestock that survived the floods.
- Communities should be provided with services for control of crop and livestock diseases.

5. Role of Government organizations

- Relevant Government Departments should be involved to help the communities before, during and after floods.
- Local police stations may be involved in early warning process and announcements.

6. Role of NGOs

- Since NGOs has already played a role in educating people and training them to face the flood challenges. So NGOs should be involved in the awareness raising and education of communities on the regular basis.

7. Collaboration between GOs and NGOs

- A collaboration mechanism between GOs and NGOs may be established for relief and rehabilitation works.

8. Role of Media

- Early warning and information system should be established. In this regard, local media, especially, newspapers and local radio can provide very useful support for provision of flood information to the communities.

9. Need for Research Studies

- It has been realized that more studies on the Climate Change and Adaptation are needed in the vulnerable areas to address the problems and hazards resulting from the climate changes.
- In order to understand the women farmers' needs of knowledge and technologies in the changing climate, more detailed and focused studies are needed.
- Public research institutions should also revisit their research agenda to accommodate women farmers' demand for new knowledge and technology.

ANNEXES

Annex 1:

Check List for PRAs

PRA Activities for the Study on Community-based Climate Change Adaptation

Activity 1: Ask the respondents in the group to Prepare their list and record the following Personal & Background Information (Method - Stakeholders Analysis)

1. Name of respondent
2. Gender
3. Age
4. Education
5. Profession
6. Village; UC; Tehsil and District
7. Approximate Overall family income (Farm income + Off-farm income from other sources)

Activity 2: General and Essential Facilities/Services and Access Issues to be probed and discussed (Methods - Venn diagram and Mapping and Institutions/Systems Diagram)

Ask the group members to identify the facilities/services listed below in their village/Union Council or in the surrounding areas, and also to discuss and record their opinions about their accesses to these services

1. Agricultural extension services
2. Livestock extension services
3. Water management extension services
4. Banks/Credit services

5. Climate information office
6. NGOs extension services
7. Health facilities, like BHUs and Dispensaries
8. Veterinary hospitals
9. Education facilities for boys and girls
10. Sources of clean drinking water

Activity 3: Perceptions of Communities regarding climate change (Methods - Time Line Charts and Historical Maps and Time Trends)

Ask the participants to prepare the Maps and Venn Diagrams to indicate the following changes:

Changes in temperature during last 10 to 20 years

- Temperature has increased or decreased or No changes observed

Seasonal changes in rain fall during last 10 to 20 years

- *Summer Season Rains increased or decreased or no change*
- *Winter Season Rains increased or decreased or no change*
- *Monsoon Season Rains increased or decreased or no change*
- *Spring Season Rains increased or decreased or no change*

Changes in the starting time of seasons during last 10 to 20 years

Change in Summer/Winter/Monsoon/Spring Seasons starting time:

If yes, what type of change?

- Starts early or Starts late or No changes observed

Changes in the duration of Wet and Dry months during last 10 to 20 years

If yes, what type of change?

Duration has prolonged or Duration has Shortened or No changes

Changes in the sowing and harvesting timings during last 10 to 20 years

If yes, what type of change?

Sowing / harvesting starts early or Sowing / harvesting starts late or No changes

Changes in the intensity level of summer and winter seasons during last 10 to 20 years

Intensity has increased / Intensity has decreased / No changes observed

Changes in the rate of the pest-attacks on the crops during last 10 to 20 years

Pest-attacks has increased / Pest-attacks has decreased / No changes observed

Changes in the prevalence of the Livestock Diseases during last 10 to 20 years

Diseases has increased / Diseases has decreased / No changes observed

Changes in the rate of the Crop Diseases during last 10 to 20 years

Diseases has increased / Diseases has decreased / No changes observed

Activity 4: Community-based Adaptation Response to Climate Changes (Water Use Mapping and Time Line Chart)

Ask the group members to prepare a chart of major crops and indicate the ratio of the increasing need of the irrigation water for different crops, resulting from the increase in the temperature during last 20 years

No.	Crops	1991-95	1995-2000	2001-2005	2006-2010
1.	Sugarcane				
2.	Tobacco				
3.	Maize				
4.	Wheat				
5.	Rice				
6.	Winter vegetables				
7.	Summer vegetables				
8.					
9.					
10.					

Ask the group members to prepare a chart of major crops and indicate the ratio of the increasing need of the irrigation water for different crops, due to adopting new varieties of seeds/crops last 20 years – 1995 - 2010

No.	Crops	1991-95	1995-2000	2001-2005	2006-2010
1.	Sugarcane				
2.	Tobacco				
3.	Maize				
4.	Wheat				
5.	Rice				
6.	Winter vegetables				
7.	Summer vegetables				
8.					
9.					
10.					

Ask the group to prepare a chart to indicate that if the farmers have adopted use of new technologies in response to climate changes and their impact on the weather during last 20 years

No.	Processes	1991-95	1995-2000	2001-2005	2006-2010
1.	Irrigation				
2.	Sowing				
3.	Crop Harvesting				
4.	Crop Threshing				
5.	Ploughing &Tilling				

6.	Pest Control				
7.	Water Harvesting				
8.	Water Management				
9.	Soil Conservation				
10.	Livestock				
11.					
12.					

Ask the group to prepare a chart and indicate if any changes have occurred in the cropping patterns in response to climate changes and their impact on the weather during last 20 years

No.	Nature of changes	1991-95	1995-2000	2001-2005	2006-2010
1.	New crops introduced				
2.	Old crops discarded				
3.	Covered area increased				
4.	Covered area decreased				
5.	Irrigation needs increased				
6.	Irrigation needs decreased				
7.	Cost of Water increased				
8.	Cost of Water decreased				
9.	Use of local pest control methods continued				
10.	Use of new pest control methods introduced				
11.	Number of crop-varieties increased				
12.	Number of crop-varieties decreased				
13.	Use of local disease control methods continued				
14.	Use of new disease control methods introduced				
15.	Use of local methods for animal husbandry continued				
16.	Use of new methods for animal husbandry introduced				

17.	Use of local disease control methods for livestock continued				
18.	Use of new disease control methods for livestock introduced				
19.					
20.					

Activity 5: Major constraints faced by the Communities with regard to the Adaptation Response to Climate Change (Method - Mapping)

Ask the group to prepare a chart to indentify/indicate the constraints which the community has been facing with regard to the adaptation response to climate changes and their impact on the weather, also showing their intensity on the scale of 1 to 5.

No.	Nature of processes	Level of intensity				
		1	2	3	4	5
1.	Access to information					
2.	Access to agricultural extension department					
3.	Access to market for sale of produce					
4.	Access to market for purchase of inputs credit sources					
5.	Access to credit sources					
6.	Access to water resources					
7.	Freedom and social mobility (males)					
8.	Freedom and social mobility (females)					
9.	Access to property rights					
10.	Access to veterinary hospital					
11.	Access to health facilities (BHUs)					
12.						
13.						
14.						

Activity 6: Major sources of information and consultation for the Communities with regard to the Adaptation Response to Climate Change (Method – Preference Ranking)

Ask the group to prepare a Preference Ranking Chart to prioritize the sources of information and consultation, from which they get guidance with regard to the adaptation response to climate changes and their impact on the weather. Use 1 to 5 scales for prioritizing.

No.	Sources of information/ Consultation	Preference Ranking				
		1	2	3	4	5
1.	Any Community members					
2.	Any other farmer					
3.	Agriculture department					
4.	Imam Masjid					

5.	School teacher					
6.	Patwari					
7.	Member Union Council					
8.	Hujra / Jirga					
9.	Government officials					
10.	NGOs					
11.	Any other sources					
12.						
13.						
14.						

Activity 7: Major factors of Vulnerability for the Communities members with regard to the Adaptation Response to Climate Change (Method – Preference Ranking Chart)

Ask the group to prepare a Preference Ranking Chart to prioritize the major factors of vulnerability for the community members with regard to the adaptation response to climate changes and their impact on the weather. Use 1 to 5 scales for prioritizing.

No.	Vulnerability Factors	Preference Ranking				
		1	2	3	4	5
1.	Age –based vulnerability					
2.	Gender-based vulnerability					
3.	Economic Status-based vulnerability					
4.	Land-holding –based vulnerability					
5.	Location-based vulnerability					
6.	Social status-based vulnerability					
7.	Cultural vulnerability					
8.	Educational status-based					
9.	Any other factors					
10.						
11.						
12.						
13.						
14.						

Activity 8: Community – based Local Adaptation Strategies with regard to the Adaptation Response to Climate Change (Stakeholder Analysis and Preference Ranking Chart)

Ask the group to prepare a Preference Ranking Chart to prioritize the role of the following stakeholders in the community-based local adaptation strategy formulation with regard to the adaptation response to climate changes and their impact on the weather on the on the basis of their contribution and effectiveness in strategy formulation. Use 1 to 5 scales for prioritizing.

No.	Role and Effectiveness of the stakeholders	Preference Ranking				
		1	2	3	4	5
1.	Role of individual members					
2.	Role of Union Council members					
3.	Role of MNA					
4.	Role of MPAs					

5.	Role of School teacher					
6.	Role of Patwari					
7.	Role of Imam Masjid					
8.	Role of Hujra / Jirga					
9.	Role of Government officials					
10.	Role of NGOs					
11.	Role female community members					
12.	Role of youth/children					
13.	Any other stakeholder					
14.						

Activity 9: Assessment of the Decision Making Processes (Pie Chart)

Ask the group to list the decision making processes as adopted for strategy formulation for community-based response to climate change and then ask them to prepare a Preference Ranking Pie Chart to prioritize the ratio (%) of the used methods.

- a. Democratic Process
- b. Authoritarian
- c. Any other

Activity 10: Assessment of the female representation is in the decision making process (Method – Pie Chart)

Ask the group to prepare a Pie Chart to reflect the roles of the male and female community members in the decision making process regarding the response to the climate change issues. Show the ratio in %.

Activity 11: Assessment of the Climate Changes resulting from disasters and adopted strategies to respond to the situation (Method – Mapping Chart and Time Line Chart)

Ask the group to prepare a Mapping Chart, to list out the climate changes which they have been experiencing during last 20 years 1991 – 2010 periods, due to Disasters, like Floods, Earth quacks, Droughts, etc. in the area and indicate the community-strategies adopted to respond to the effects of these disasters.

