Indigenous Strategies of the Fishing Community to Combat Climate Change

(A Case Study of Village Shinah Walla, District Layyah)

By

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Islamabad - Pakistan
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Thesis submitted to the Department of Anthropology, Quaid-i-Azam University Islamabad, in partial fulfillment of the degree of Master of Philosophy in Anthropology.

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Islamabad, 10 December 2020

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Final Approval of Thesis

This is to certify that we have read the thesis submitted by Mr. Muhammad Ishaq It is our judgment that this thesis is of sufficient standard to warrant its acceptance by the Quaid-i-Azam University, Islamabad for the award of the Degree of M.Phil in Anthropology.

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DEDICATION

I dedicate this work to my AMAAN JAAN and my WIFE

ABSTRACT

Climate change is happening around us not only in Pakistan but also in the world. Nowadays it has become the major issue of the global world. The situation of Asian countries has the worst because of carbon emissions. The climate change adverse effects and impacts observed in Pakistan and globally such as extreme climatic events, floods, droughts, wildfire, cyclones, heatwaves. The climate change is affecting and will have been effected the human being and its livelihood no other issue might be an effect. How is it devastating for a human being? What causes are climate change? The answer is simple that climate change is happening due to anthropogenic activities or global warming. Before the industrial revolution, climate change was not an issue. The reason is simple and obvious that in that time appropriately no use of fossil fuel (petroleum and gas) or in other words, the there was no emission of carbon dioxide. Nature makes the balance of CO2 and other gases emissions and consumption. The emissions of gases especially CO2 consumed through vegetative cover forests and plants through photosynthesis process. So that was naturally balanced between gases and climate. The natural balanced disturbed through anthropogenic activities such as industrialization, urbanization, mining, deforestation or depletion and so on. Consequently, the production of CO2, methane and other gases increased and consumption decreased and naturally balanced imbalanced. The forests exist in the three major areas of the world such as Amazon basin in Brazil, Congo basin in Africa and aqtrial forest in Indonesia and Malaysia. In short, glaciers start melting and sea level rising day by day. The temperature increases from pre-industrial level i.e. 1.5 degrees. In the world, the larger emitter of CO2 is China that emits around 30% CO2 because its energy requirement is larger due to its huge population. The second emitter is the USA that emits around fourteen percent. The important thing is that the climate change impact is worldwide not only on larger emitters but also those countries their emission is a little. For instance, Philippine its emission is 0.5% but that is affecting equally to the rest of the world. Due to extreme heatwaves and rising of sea level, there is a danger to the displacement of people in the world. The civil society organizations held meetings in the form of Kyto Protocoal in Japan, The Paris agreement in Paris and Conference of the Parties 25 in Spain in 2019. In these meetings indicators set not verifiable but advisory.

The situation of climate change in Pakistan is alarming especially on the Indus River. The Pakistani government has been taken various initiatives to combat climate change, drafted policies and approved acts and laws so that reduced emission of greenhouse gases. The present research study investigates the qualitative analysis of climate change regarding indigenous and adaptive strategies of the fishing community on the Indus River to combat climate change. The study purpose is to investigate the connection between climate change and its impact on the fishing community.

To carried out this research in an organized and systematic fashion, the various articles, books, blog posts, websites and dissertations read out as a secondary source of information. The major characteristics of this study are indigenous and adaptive strategies of the fishing community for combating climate change and its impact on their livelihood, culture and gender are important features of this research study. The research contributes its findings and results so that understand the critical aspects of a climate change, the fishing community and the Indus River. The research significantly finds out the strengths and weaknesses of the implementation of policies and laws at the grassroots level. Furthermore, the research contributes insights towards livelihood initiatives, gender quality and equity, policy formulation and so on.

The research is living document which gives guidelines and directions regarding climate change friendly initiatives so that its impact could be reduced and formulate action plans. The research emphasis on human and institutional capacity building initiatives. The research results and findings will useful for climate experts and policymakers, students while the formulation of new policies and conducting new research endeavour. The research fulfil the knowledge gap like drop in the ocean especially on the Indus River and the fishing community.

The research analysis and data give valuable information and insights to the district, provincial governments, civil society organizations and climate experts. It has been open new research avenues for further research in climate change.

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1. INTRODUCTION

Although there have been voices alerting the world about climate change for several decades, the new millennium has ushered in an increasingly potent stirring up of public, private, and international attention to and, in some cases, action on the issue. Numerous scientific reports compiled by international teams of experts confirm that climate change is not only happening but is very likely caused by human activity, a point clarified by Climate Change 2007, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change‘ (Crate S.A., & Nuttall M., p.10 as cited in IPCC 2007).

_Climate is a product of weather which always experiences variations over space and time.Natural reasons result in climate variability over different time scales but they are least responsible for a significant change in climate. Solar and volcanic activities fall under natural processes and they cause short lived changes in weather conditions as a result producing fluctuations in climatic pattern. Land, ocean and atmosphere interactions have been resulting into usual cyclic variations in weather and hence climatic conditions over the globe. Anthropogenic activities are mainly blamed for global warming and climate change. Anthropogenic reasons are controllable but they been dominating now over the natural, due to which balance of the atmospheric heat budget has been disturbed and more amount of heat has been trapped in the biosphere than usually required to regulate the life processes‘ (Rasul, 2012, p.7 as cited in Peter et al., 1997).

From an anthropological perspective, climate change is ultimately about culture, for in its wake, more and more of the intimate human-environment relations, integral to the world‘s cultural diversity, lose place. For indigenous peoples around the world, climate change brings different kinds of risks and opportunities, threatens cultural survival and undermines indigenous human rights. The consequences of ecosystem changes have implications for the use, protection, and management of wildlife, fisheries, and forests, affecting the customary uses of culturally and economically important species and resources. The effects of climate change are not just about communities‘ or populations‘ capacity to adapt and exercise their resilience in the face of unprecedented change. Climate change is also about the re-locations of human, animal, and plant populations to adjust to change and to cope with its implications. Such re-locations, both actual and projected, entail a loss of intimate

human-environment relationships that not only ground and sub-stantiate indigenous worldviews, but also work to maintain and steward local landscapes. In some cases, moves will also result in the loss of mythological symbols, meteorological orientation and even the very totem and mainstay plants and animals that ground a culture‘ (Crate S.A., et al., 2009 p.12)

The United Nations Framework Convention on Climate Change (UNFCCC) of article one, defines climate change as, ―a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods”(UNFCCC, 1992, para 2).

For indigenous people struggle to be continued at international forums and particularly at United Nations level for their rights, identity, language, economy, traditional ways of living and so on. At UN level first involvement of indigenous people start in 1923-1925. Working Group on Indigenous Population (WGIP) established in 1982. In 1993, this year declared the international year for world‘s indigenous peoples. In 1994, international decade of the world‘s indigenous peoples and 2019 international year of year of indigenous languages. In 2007, established ‗UN Declaration on the Rights of Indigenous Peoples (UNDRIP)‘.

Furthermore, the UN Declaration on the Rights of Indigenous Peoples approved and adopted in 2007 that is a living document for the rights of world indigenous peoples and stated, ‗giving prominence to collective rights to a degree unprecedented in international human rights law. The adoption of this instrument is the clearest indication yet that the international community is committing itself to the protection of the individual and collective rights of indigenous peoples‘. (UNDRIP, 2007)[1].

The UN has seventeen SDGs (Sustainable Development Goals). Its goal thirteen – Climate Action specifically about changing situation in the climate on our planet Earth and demanding urgent and long - lasting action. However, SDG goal seven, clean and affordable

[1] https://www.un.org/development/desa/indigenouspeoples/about-us.html

energy, fourteen, life under water and fifteen is about human existence on earth generally linked to climate change.

The UN Sustainable Development Summit held on 25 September, 2015 in which member states agreed on 17 Sustainable Development Goals and 169 targets. The member states showed their interest and commitment regarding climate change: ‗We are determined to address decisively the threat posed by climate change and environmental degradation. The global nature of climate change calls for the widest possible international cooperation aimed at accelerating the reduction of global greenhouse gas emissions and addressing adaptation to the adverse impacts of climate change. We note with grave concern the significant gap between the aggregate effect of Parties' mitigation pledges in terms of global annual emissions of greenhouse gases by 2020 and aggregate emission pathways consistent with having a likely chance of holding the increase in global average temperature below 2 °C or 1.5 °C above pee-industrial levels' (SDGs, 2015).

According to Oxfam, ―Climate change fueled disasters were the number one driver of internal displacement over the last decade, forcing more than 20 million people a year – one person every two seconds to leave their homes" (Oxfam, 2019). The combative subject of monetary sustenance for people. Counting the evacuated people, this must hurt damage and costs as a consequence of the climate disaster.

Furthermore, Oxfam articulate that ―the climate crisis is here and now. It is wreaking havoc across the globe and it's the poorest communities and women who are paying the heaviest price" (Oxfam, 2019).

It is said that changes in climate are humankind's own destruction despite the western oppression, wickedness and ignorance. According to H.A. Smith ‗the very characterization of climate change as ―man" made and ―global" implies universal rather than industrial culpability, conveniently ignoring inequalities' (H. A. Smith, 2007). Moreover according to W.D. Smith ‗Universal blame is also, interestingly, adopted by some indigenous communities, those who seem to best exemplify the injustice of climate change and the wisdom of an industrial-blame stance' (W. D. Smith, 2007).

Experts favor the word climate change to worldwide heating. The previous word points out that, elsewhere increasing temperatures. There have been variations in sea levels, rainfall, hurricanes, and ecology effects‘ (Kottak, 2014, p. 282). In Pakistan super flood 2010, heavy rains in 2011 in Sindh, stroke of heat wave in 2015 in Karachi, Sindh. Also, this is tough connected with any any one occasion to changes in climate, the combination among numerous cases might designate climate change is performing a function.

Scientists have a moral obligation to clearly warn humanity of any catastrophic threat and ―tell it like it is". On the base of this responsibility and the statistics, approximately11, 000 researcher participants from everywhere the biosphere state, obviously and unambiguously that globe Earth‘ is facing a climate ―emergency" (Ripple, Wolf, M, Newsome, Barnard and Moomaw, 2019, p.1). According to IPCC, ―climate change is predicted to greatly affect marine, freshwater, and terrestrial life, from plankton and corals to fishes and forests" (Ripple et al, 2019, p. 2 as cited in IPCC 2018, 2019). According to Ripple who was among the 11,000 scientists ―the climate crisis is closely linked to excessive consumption of the wealthy lifestyle" (Ripple et al, 2019, p.1).

1.1. Fisheries and Climate Change

It is causing chaos through the world and it‘s the under privileged such as the fishing community and females who are giving the heaviest amount. Numerous persons after the communal had previously gone their families, livings, and kids and parents as a consequence of extra hazardous and supplementary recurrent floods like super flood 2010, 2012 – 2015 floods in Punjab and Sindh droughts, storms all instigated by a climatic catastrophe they did not create. These people previously experienced weather excesses and absence the capitals to adjust to the effect of climate change for instance suitable climate checking locations or flood barricades.

Despite the difficulties of studying fishing skills, there is growing body of literature on the subject which demonstrates that in many fishing societies the kinds of skills necessary for success are very much the same. Obviously fishermen must know how to operate and maintain his boat and equipment‘ (Aches, 1981, p. 290). Indigenous knowledge often facilities people‘s skillful management of their resources. People carry knowledge and

transfer it between generations, using idioms alien to science, featuring symbols, myths, rites and so on‘. (Sillitoe, 1998, p. 227).

At the time of floods and land erosion there are less opportunities of catching fish. This means you have to find other ways to make money and buy food for your family. Due to the increase in workload, women have little time to engage in other income-generating activities or public life, and society‘s expectations of women‘s role in society have further exacerbated this situation. Fishers often run out of assets. Credit, access to land or property has helped us better cope with climate impacts. Disasters caused by climate are the number one cause of domestic displaced people, with millions of people having to leave their homes to find refuge in their area.

1.2. Anthropology and Climate Change

Anthropology has played a central role in this discourse. Thinking of the intellectual forebears the discipline from the classical era to modern times, as well as anthropology proper over the past two centuries. ―Theorizing regarding the relationship between nature and culture, between environment and society, has been central to the development of anthropology as a field. Consider as an example what is known as ―climate theory" referring to the idea that climate determines human character, culture, and the rise and fall of civilizations" (Dove, 2014, p, 21).

Throughout the twentieth century, anthropologists were very much concerned with climate through their studies of survival performs of hunting then gathering, fishing, herding and agriculture (Evans-Pritchard 1940; Richards 1948). Classic studies in environmental anthropology by the likes of Steward (1955), Mauss (1977) [1950], and Conklin (1957) ―dived deeply into emic or native view of climate‘. The anthropologists built on this experience when, advanced in twentieth era, more clearly climatic topics arose, like ruin and desertification‘ (Spooner and Mann; Little and Horowitz 1987).

In 1977, Margaret Mead was the first anthropologist who speaks about the climate change. For the past two decades, anthropologists have been involved in a significant way with research on climate change (Crate 2011), whether the involvement is measured by meetings and conferences, or grants and publications, including some noteworthy edited

collations (Strauss and Orlove 2003; Crate and Nutall 2009). Initially, this involvement built on traditional anthropological expertise with small, local communities, for instance, studying issues of risk and vulnerability (Ribot; Magalhas, and Panagides 1995) and the reality or prospects for adaptation (Berkes and Jolly 2001; Finan and Nelson 2001; Eakin 2006). From there anthropologists moved to related topics such as REED (Reduced Emission from Deforestation and Degradation), drawing on the field‘s expertise on indigenous, forest-dwelling people in the tropics (Schwartzaman and Mountinho 2088).

A long-established attention in the impact of climate change on ancient societies has been greatly reinvigorated by contemporary climate change debates (Bawden and Reycraft 2000), with special interest in the El Nino-Southern Oscillation (ENSO) phenomenon as a proxy for climate change. From these beginnings in familiar ground, anthropologists have moved to such non-traditional topics as the international institutions involved in climate change research and policy, for example the IPCC (O‘Reilly 2012), the meetings at which the global climate change community attempts to hammer out policy (Doolittle 2010), and thorny issues of communication and public skepticism (Diemberger et al. 2012).

These new directions notwithstanding, anthropologists insist their work on climate change which some have called ―climate anthropology‖ (Nelson and Finan 2000) or ―climate ethnography‖ (Crate 2011) – ―takes advantage of the traditional strengths of the field‘, which Roncoli, Crane, and Orlove (2009) refer to as ―being there‖ and ―the capacity to provide insight into perceptions knowledge, valuation, and response‘.

There are number of dimensions to contemporary climate change that require these sorts of insights:

i. ―Climate change has a reality at the local level;
ii. Global debates about climate change policy are affected by North-South post-colonial histories;
iii. Climate change likely been imbricated in the evolution of human society; and
iv. The knowledge, science, and understanding of climate change is itself a social phenomenon, which affects the prospects for mitigation and adaptation. No other discipline matches the capacity to illuminate such issues of anthropology, which

thus has something unique to offer to contemporary debates about climate change research and policy‘ (Magistro and Roncoli 2001).

There is a serious gap in the anthropology of climate change. Scholars with anthropological inclinations, and even the entire human society, have been thinking about climate change and society for thousands of years. This period of history is a valuable resource for handling changes in climate in 21st century. The research study on the direct effects of climate change on the entire fishing community and fish production is limited.

1.3. Problem

The research investigates the climate change adaptation strategies and local cultural perceptions of a fishing community. It further explores how climate change shapes the livelihood of both the male and female members of the fishing community in Shinah Walla village.

1.4. Statement of the problem

The Indus River delta is drying up and fish production is decreasing. This will ultimately impact the community livelihood in the area. This thesis explores the point of view of the fishing community members, general public, media and government departments around the impacts of climate change on the river based communities. The ever-increasing threat of climate change on the fishing people‘s livelihood in the context of Pakistan have not been explored in great details before. This study investigates how the overall impact of reduced fish production in winter and somehow summer season impact the lifestyle of the fishing community.

The Indus River erosion in the river delta is another contributing factor that badly impact on catching fish. This is happening from decades but differ in its impact in different areas and on different community members. The situation has rapidly worsened in the last three

decades, particularly through the impacts of the climate change. This problem affects the fishing community livelihood, health, social and cultural ecology, farmers and their crop yield, and health and wellbeing of their livestock.

Currently, the fishing community on the Indus is unable to hunt fish because the fishing spots are reducing. People have to spend too much time searching and locating the areas where enough fish is available. This problem was identified while conducting a piolet study and the researcher discussed this issue in detail with the members of the fishing community. During my data collection phase, the researcher discussed the barriers that impact fisher community‘s ability to maximize their fish production, and local strategies for climate change adaptation.

Presently, the fishing persons have to spend the whole day searching and finding fishing location and catching fish. It means half of their time spends finding their food and the source of their income, and little time for other tasks. As a result, the reduced fish production, and in turn climate change, is impacting their general life patterns.

This study focuses on climate change and adaptation strategies of the fishing community of village Shinah Walla on the Indus Rive. The purpose of the study is to investigate the changing situation on the Indus River because of climate change and the fishing community‘s adaptive strategies to cope with the phenomena. The research problem that this research study addresses is that climate change on the Indus River has severe impacts on the fishing community‘s socio-economic, socio-political, cultural values, women role in day to day economy, the health of vulnerable population. The research derives socio-economic and socio-political implications of climate change on the fishing community.

The study specifically evaluates and analyses fishing persons‘ perception regarding climate change and adaptive strategies, the factors influencing their perception and awareness towards climate change and the impact of this change on fishing practices. It will also document what are the negative impacts of climate change on the availability of fish in the river, and how does it affect the fiss-based livelihood? The level of adaptation regarding climate change in the fishing community depends on their level of awareness that is influence by fishing persons‘ age (including their years of experience), the number of

fishing trips they make in a day, month, and year, and the types of boat and tools, and the strategies they apply in catching fish. The study will focus on various suggestions so that to improve livelihood of fishing persons.

The coping mechanism and indigenous adaptation strategies of climate change impacts on the rural communities have not yet been well documented in the context of Pakistan. An examination of the extent to which different areas have been threatened by climate change impacts is important for developing improvement strategies for the fishing community‘s livelihood. This is due to the fact that it reveals the existing situation on how community is vulnerable to impacts of climate change. Therefore, the study will provide a deeper examination of the adaptation and mitigation strategies to climate change for rural communities.

1.5. Research Objectives

- To study the impacts and the perceptions of the fishing community regarding climate change on the Indus River.
- To document what indigenous adaptive strategies of the fishing community adapts the impacts of to combat climate change.
- To study the effects of climate change on the household economy of the fishing community.
- To understand the cultural values of the fishing community in combating climate change.
- To examine the gendered aspects of climate change, with a focus on the role of women in assisting fishermen in their adaptation of climate change

1.6. Conceptual Framework

A case study approach will be adopted to examine indigenous adaptive strategies of the fishing community to combat climate change. The research is the case study of the fishing community regarding indigenous strategies to combat climate change on the Indus River. I would like to conceptualize this topic from three perspectives. First of all, I refer to the indigenous strategies of the fishing community – the strategies that they adapt to combat

climate change at local level to protect their livelihood. In this way, I would explain local or native strategies of the indigenous communities, particularly those which are adopted by them from centuries. Indigenous strategies mean the fishing community response to combat climate change. Indigenous strategies here mean the action of the fishing community to respond climatic variations. Secondly, I understand their socio-economic practices and how they are reshaped and reconfigured in this increasingly climate change era. Exploring those socio-economic practices also mean that I explore their inter-familial relationships, their socialization, economic opportunities available to them, and their interaction with the larger society. Finally, I look for the role of the state in helping the poor and marginalized fishing community people. By doing this, I also explore fishing people's expectations form the state, the opportunities they achieve on the district level while interacting with state actors, and the issues this fishing community-state interaction can generate in future.

Every researcher forms some basic themes to which s/he stressed out during the research work. In order to complete this research, I have these three basic themes concepts which are directly related to my field of study. Further clarity of these concepts is given below.

1.6.1. Climate Change terms and their conceptual relationships

According to Inter-Governmental Panel on Climate Change (IPCC), climate change means "any change in climate over time, whether due to natural variability or as a result of human activity'. This usage differs from that in the Framework Convention on Climate Change, where climate change is referred to as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (IPCC).

"Climate change refers to a systematic change in the key dimensions of climate including average temperature, wind and rainfall patterns over a long period of time while climate variability in turn consists of a shorter term variation in the same dimensions of climate' (Paavola, 2001). **27** Carter 2001, it defines "climate change" as a change of climate which is attributed directly or indirectly by human activity that alters the composition of global atmosphere" (Carter, 2001).

There are number of adaptation actions for fisheries to confront/combat climate change. Although the efficiency of different adaptation actions is poorly known, there is consensus on the importance of improving the resilience of fisheries. Resilience is the ability of the system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change all while accounting for the interdependence of people and nature.

1.6.1.1 Coping

Coping refers to actions taken in response to an extreme event, like a storm or drought, to ensure survival and often results in a long-term decrease in well being. Coping happens in the absence of pro-active adaptation that results in the vulnerability of people and ecosystems to climate and extreme events IPCC TAR, 2001. Furthermore, coping refers to responding to the disturbances in a way that mobilizes the actor‘s ability to draw on available skills, resources, and experiences‘ (IPCC, 2001).

1.6.2. Adaptation

Refers to the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation (IPCC TAR, 2001 a). For this research study, adaptation refers to individual adjustments from daily livelihoods in response to actual climate change effects. Adaptation and transformative action in fisheries can happen at the individual (fisher people), collective (community), and institutional (governance) levels, and it is important to be aware of potential maladaptation or unsustainable adaptation strategies.

1.7. Research Methodology

In order to conduct anthropological research, researchers usually take the help of multi-methods. Theoretically the method is the mixture of tools and techniques will be used for the data collection. This includes various phases of data collection with appropriate tools. Sometimes information required is already available and needs only to

be extracted by applying some indirect methods while sometimes the information must be collected through direct application of appropriate tools according to the situation. For the completion of the research work, the researcher selected some anthropological methods.

Overall, the social sciences vary from other scientific arenas in that prime data gathering is typically likely deprived of the help, of extremely focused tools. Anthropologists defined methodology in these words, ‗methodology, then, refers to the structure of procedures and transformational rules whereby the scientist shifts information in order to produce and organize increased knowledge' (P.J. Pelto, G.H. Pelto, 1978, p.2).

A desk review of the literature on the Indus River fishing communities and climate change indigenous adaptation strategies carried out. All settlements visit with a view to understand their layout, the lived experience of people residing there, and the climatic and indigenous adaptation strategies related issues and challenges facing the fishing community. The research conducted through observation, formal and informal interviews, focus group discussions, photographs. Before, to the start of the research, the questionnaire refined and adjusted through field testing. Interviews with key informants conducted during the study.

Fishing community was designated because it had relegated community that was powerfully and exclusively reliant on on the area's natural resources base for their living was nominated. In the community, any additional deprivation of the natural resources base persuaded by climate change would must a straight bad impact on their livings, forceful them more into scarcity. The village chosen encompasses minor fishing with no other foundation of revenue who are most affected by inundating, land erosion and other climatic changes.

An inquiry study was established and carried out to broadly and accurately examine the effects about climatic changes on livings and sources of income regarding fishing community of the Indus River. An open questionnaire was planned to acquire ground information in directive to study the fishing community's perception about climate change. The effects it has had on their adjacent bodily setting, organic setting, and socio-economic condition (i.e. their livings over a long period) and their adaptive plans to fight climate change.

An initial study was conducted to examine the instrument and questionnaire onsite, following which the study was directed to get data. The investigator consumed an prolonged period of time (more than six months) in the ground, interrelated with the fishing people and collected the essential information through collection debates and detailed interviews of both men and women community members. For the purpose of the research, respondents from above 20 years old were interrogated so that accurate and rational data could be easily collected.

Afterwards gathering facts and figures from the ground through the sample, in-depth interviews, focus group discussions, accessible examined studies carried out internationally, county-wide, and locally conducted by anthropologists and other social scientists were sensibly studied and get insights from them.

1.7.1. Rapport Building

The understanding and rapport construction is the initial phase of anthropological research. It is providing a platform to build good collaboration with the native people and to finalize key informants. Understanding and rapport building was used to acquire the visualization of substances during study the phenomena. Concluded this way, the respondents were cooperative in getting essential data mandatory by the investigator.

This is the greatest dependable and reliable technique in anthropological study. However the study setting was not new however, I developed the rapport to gather and examine the in-depth information and data. Consequently, first of all, I was arrived into the fishing people through the reference of my key informer and developed understanding and rapport with other persons of the fishing community for well study results. The rapport building technique helped me to best closer with my respondents and as well as provide enough period to get adjusted in the field.

1.7.2. Observations

First of all the building of good rapport is necessary, despite of which no method can be applied. This first and crucial step helps the researcher to restrain local barriers, gets the valid data and also assists him to apply some other techniques. The participant observation is the technique which is next to impossible without the appropriate rapport building.

Participant observation is considered as the hallmark of anthropology, and is simply defined as to observe the activities of the informants as the participants that informal relation will develop, researcher, try to sit during the investigation of violence victims cases and note down carefully, not only the verbatim but the observe cautiously the behavioral changes.

This technique also enables the researcher to take interviews with females within the community. Although due to some cultural barrier, the male researcher found as much appropriate place for research with the women as a female researcher would be, but after all, with this technique researcher also become aware of the terminology which women use during the process of making fishing tools, caring livestock and preparing food.

1.7.3. Detailed (in-depth) Interviews

The interview is a face to face conversation between two persons to deliberate something keeping in view firm objects. The important and most noteworthy method of interview is in-depth interviews. In-depth interviews mostly contain the open ended and unstructured questions, and they also mandate the existence and full attention of the investigator during the interview. Probing is one of the important tool use efficiently by the researcher during the process of in-depth interviews.

During this research work, researcher had taken twenty six interviews from men and women. Distinct questionnaires established for the fishing community and general public. Keeping in mind the sensitivity of subject and cultural and traditional conditions, in-depth interviews carried out sensibly and also takes with full attentiveness so to extract precise and accurate and reliable data.

1.7.4. Interview Guide

The interview guide is the technique through which the researcher asks the respondents some basic and relevant question about the research in a systematic way. Mainly interview guide consists of some portions which divided on basis of research objectives. Every portion of the interview guide used for this research some structured and unstructured questions, which usually researcher asked respondents after their consent.

1.7.5. Informal Discussion

Informal discussion is a technique which makes the researcher able to know some of the hidden facts that one may not achieve without the help of indirect discussion with respondents. The researcher asked the respondents some hypothetical and extreme questions. This technique also helps the researcher to build a good rapport with the respondents.

1.7.6. Key Informants

In directive to carry out anthropological research, the researcher needs two or more than two key informants so he can collect appropriate, widespread and consistent data. The key informants are those persons, who could perform a significant share and role during the development of rapport building and information gathering. Therefore, in this research, after requiring a great deal of experience, the researcher selected five key informants. Two of the male from community, another female from the community and two youth member‘s one was male and the other was female.

1.7.7. Focus Group Discussion

Focus group discussion is the technique in which the research gets the relevant and diverse viewpoints about the issue he is studying. By selecting about eight to twelve people, researcher invokes the topic (i.e. the extent of climate change, religion and climate, cultural norms regarding climate change). The focus group discussion also enabled the researcher to draw an appropriate outline of the socio-psychological structure of the community in his mind.

I had conducted 08 FGDs (Focus Group Discussions) for the purpose of this study. In the focus group discussion, the contributors were engaged on the criteria of their willingness, speaking power and the sound knowledge of the fishing. At one time, through applying this technique, I found the chance of hearing and discussing to diverse groups of persons. The condition of native adaptation strategies, these people shared their insights about this.

For this research study, focus group discussion (FGDs) contained eight to twelve individuals. So that everyone got a chance to talk and participate to express his/her views

about the personal experience of climate change. The composition of focus group discussion (FGDs) was like the head of community, old persons, youngsters, women (they did not participate in a mix group discussion. However, then I arranged three separate group discussion with the help of my key informant.

1.7.8. Photography and Recording

Today's visual anthropology is of great significance and has an impact on the entire anthropological discipline. Contemporary researchers are trying to make anthropology more and more scientific. For the development of anthropology, they are creating visual ethnography. Therefore, in this study, researchers used snapshots with cameras, video and audio recorders to combine large amounts of data. For capturing important events and recording in-depth interviews, the help of technology is very beneficial.

These have provided great help to researchers in the process of explanation and analysis. These photos and recordings provide support for research collected data and are reliable evidences about the research in this field. The photographs and recordings were taken over at various locations, showing how fishers utilize their abilities and strategies incoming their daily lives in different ways. These have provided great help to researchers in the process of explanation and analysis.

1.7.9. Case Study Method

The case study method used by the researcher helped him to fully understand the interviewee‘s life and past experience.

According to the Gluckman, ―ease study always helps to gain clear situation analysis. It is an empirical inquiry that investigates contemporary phenomena with its real-life context, and the phenomena are not clearly evident and in which multiple sources of evidence are used. Clearly, a good case can illuminate the working of the social system in a way that a series of morphological statements cannot achieve” (Gluckman, 1996, p.9).

In the theme surrounding climate change and especially adaptation strategies. Asking the community about their life experiences and their current feelings about climate change is an important aspect of this research. Obviously, certain life events will change people's

entire life concept, which has been tested by this technology. For this study, cases were identified in in-depth interviews, focus group discussions, and consultation with key information providers.

1.7.10. Sampling

A simple random sampling technique is used for this research study where each individual in the village had an equal chance of being involved in the study as a sample representative. A sample of 82 households in the village Shinah Walla.

Sampling is a technique through which researcher get the smallest representation of the whole population. In any research it is necessary to take defined and selected set of respondents from the larger population. For the present research, I had taken 50 respondents by using snow ball sampling. This sampling technique helped the researcher to access over the relevant data in a more accurate way.

1.8. The Study Significance

In remote rural areas, the life and beauty of neglected social classes are important. They constitute the form of our broader national culture. Socio-economic conditions and historical memory have evolved into folk traditions endowed with local cultural characteristics. The basic elements of any research aimed at discovering our folk cultural heritage. Indeed, in any existing economy. The mode of production is the corresponding social relationship on the supernatural level. In other words, ideology, culture, political system, value system and beliefs are integrated as part of the research. In addition, it found traces of our folk heritage in the context of proper social relations in history.

The influence of the encompassing nature and natural phenomena, the life course of mankind is affected at all stages of his career; the flora and fauna that constitute the means by which he depends have greatly influenced him in almost all human societies (whether barbaric Tribes are still the way of life within the circle of civilized countries. There are ancient beliefs, ancient customs, and ancient memories. These are the relics of the unrecorded past.

The research was conducted from a case study perspective, involving climate change and fishing community adaptation strategies to respond to water scarcity, floods, thunderstorms and changing weather patterns. The life of a fisher is related to water throughout his life, involving risks and exciting moments in adventurous adventures. This is an interesting subject of cultural studies. They are full of optimistic and pessimistic attitudes towards life, as well as a hint of quiet and fatalism as a direct result of his lifestyle and way.

Superstition has formed a special value and belief. It is a characteristic. Folklore, songs, legends and another legacy of the past have more or less formed the present tangible heritage. In the final analysis of socio-economic and political issues, It can be useful when understanding and questioning. The main content of the descriptive ethnographic research conducted in the Indus is that the indigenous environment of fishermen will affect their socio-economic behaviour and their impact on modern life.

1.9. The Site/Locale

The research conducted selected the location of Shinah Walla village. There are certain reasons for choosing this village as my research site. First of all, the fishing community belongs to this village. Many people take fishing as their main occupation. These people have been in this profession for centuries. Secondly, this village is located near the river bank and has different ecological conditions compared with other fishing areas in Pakistan. Life in this area is largely influenced and influenced by its environmental forces.

The site of the field study was the village Shinah Walla, located on the banks of the Indus River, Laiya District and Punjab. The fishing community lives 12 kilometres away from Karor Lal Eason. People have lived in this village since ancient times. Fishermen related to the fishing industry have their specific cultural characteristics and value systems. They have a common history, tradition and ecological conditions.

1. REVIEW OF LITERATURE AND THEORETICAL FRAMEWORK

Social science research on climate change has focused on members of society and human behaviour. What are their views and understandings on climate change; how and why they formulate or ignore actions based on these ideas; what measures can governments, experts, scholars or other people take to follow this path, for example, by trying various ways to communicate about climate change the same data and knowledge? In the anthropomorphic dimension of climate change, we see the full range of human brands. This kind of dynamic perception and intervention is shocking work.

Without studying the research-related literature, it is very difficult for any researcher to complete his work in an effective way. This technique can help researchers master the subject in a more confident manner, collect field data, and apply research techniques with complementary efficiency. Researchers usually face the analysis process of common obstacles, and a clear understanding of the research problem (not possible without proper literature review) helps him a lot. Therefore, anthropologists usually tend to master enough literature reviews to make their research more scientific and logical.

1.1. Climate Change a Global Phenomenon: A Focused Literature Review

The classical anthropologists had carried out the work about climate change but the contemporary anthropologists have inverted their focused to climate change and assert that, anthropology has much to offer to the examination of the nexus of nature, culture, politics, and belief that constitutes climate change‘ (Baer and Singer, 2018).

According to anthropologist Mary Doughlas the societal achievement of a clean environment will require that people change their laws, and changing these will change the pattern of wealth and income distribution, and this will change the flows of goods and people on birthdays, anniversaries and weddings, retirements, funerals, sick visiting, and ordinary Sunday family gatherings‘ (Baer et al, 2018, p.28).

According to Chiras there are factors influencing the earth and he stated, _the Earth‘s surface temperature is influenced by two key factors: those that affect the amount of sunlight striking the Earth and those that alter the amount of heat lost or retained. In other words, the Earth‘s temperature is affected by the influx of solar energy and loss of heat. Both natural and anthropogenic factors influence these processes‘ (Chiras, 2013, p. 451-452). He emphasized that natural factors like sun and anthropogenic factors like CO2 emissions are major contributing factors regarding climate change.

On that point, both earthy cause that causing worldwide temperature, as a outcome, the global changes in climate by nature time period . In reality, the World cycles‘ between glacial spells and put down frozen warm periods. Currently, there is a warming period that we are facing and day by day it is increasing. Modification in mountain human activity besides show a function in climate change. Enhanced in volcanoes, consequence in of residue that cut down solar increase, temperature reduction in the planet Earth. Accordant to scientific discipline, unstable activity looks to show an essential duty in annually climatic variance, and location is not too much information to propose that extended period of volcanic eruption cause long-run.

The planet Earth is affecting by GHSs (greenhouse gases) - carbon dioxide and methane naturally. The Scientist, Chris, says, _

_The Earth‘s temperature and the concentration of two naturally occurring greenhouse gases, methane and carbon dioxide, also change cyclically – approximately every 100,000 years or so. What causes these changes? Scientists believe that natural causes – for example, changes in the Earth‘s tilt or solar activity – stimulate increases in temperature. It, in turn, increases forest and grassland fires and the decay of organic material, which increase carbon dioxide and methane levels. These greenhouse gases, in turn, increase global average temperature up to a point‘ (Chiras, 2013, p. 452).

It is a common understanding that only anthropogenic activities affect the planet Earth temperature. On the other hand, emissions of carbon dioxide and methane naturally affected the Earth. Human activities (anthropogenic) element that addition worldwide temperature likewise impacts international normal temperature. The most important activities emissions of (GHGs) greenhouse gases (GHGs) and deforestation. The (GHGs)

greenhouse gases like methane and carbon dioxide occur physical and human activities (anthropogenic). The freeing of GHGs (greenhouse gases) from earthy origin stay permanent over one hundred years and with that release from anthropogenic sources have inflated dramatically.

Not all GHGs (greenhouse gases) have an earthy source. CFC (Chlorofluorocarbons) and their substitutes, the HCFCs (Hydro Chlorofluorocarbons), for instance, have no physical beginning. Their manufacture and action have increasing speedily for the last seven decades. Though chlorofluorocarbons (CFC) action has decreased suddenly. Not each CO2 (carbon dioxide) occurs from the burning of remains. Environmental condition and cutting of forests, for instance, also bring forth an important sum of CO2 (carbon dioxide). How does environmental condition outcome in addition in atmospheric CO2 (carbon dioxide)? Environmentally, all flora, including trees, takings CO2, trees change into plant life substance.

What are the reasons to find out weather conditions and climate change? Taking into account the temperature and precipitation, the weather conditions are related to the surrounding daily conditions. The weather always changes weekly, daily or even hourly. On the other hand, the climate is long-term (approximately 27 years) average weather.

There were so many causes and factors that regulate the planet Earth‘s weather and its climate such as heat and light onset various parts of the planet. The planet Earth has three climatic zones such as the temperature, the polar and tropics. In detail the scientist Chrias explained the three zones:

_The tropics lie on either side of the equator between 30 degrees and 30 degree south latitudes. They receive the most light and heat energy from the sun and are the warmest. The temperate zones lie between 30 degrees and 60 degrees, both north and south latitudes. They receive less heat and sunlight and are therefore cooler. The poles receive the least amount of solar energy and are the coolest. The Earth unequally heated, which three major climatic zones: tropical, temperate, and polar. The air tends to flow from the equator to the poles‘ (Chiras, 2013, p. 74-75).

The anthropology of climate change, starts with Margaret Mead‘s, that endeavour dilated into a perceptive of anthropogenic climate change as so far some other blazing contraction of the capitalistic global system, and the condition to surpass it with an alternative world system based upon social equity and justice and environmental sustainability (Baer and Singer, 2009). According to St. Peter Mead is frequently quoted for her apparent and straightforward argument: We won‘t have a society if we destroy the environment (St. Peter, 2010, p.213).

Moran views our global economy in its present form as unsustainable and destructive of the planet‘s future productive capacity” because it is exhausting Earth‘s fisheries, its water, its soils, and a host of other resources” (Moran, 2006, p. 166). Furthermore, Moran argued this in 2010 the exploitation of the huge amounts of fossil fuel materials stowed away for geological periods of time in sub-terrestrial sinks and the launching of the by-products from their use into the biosphere kicked off bio geo-chemical changes in the atmosphere that took a couple centuries to be felt and which now threaten our planet” (Moran, 2010, p. 64).

In his essay, Hans Baer explained that global warming in many ways constitutes yet another contradiction of the capitalist world system with its treadmill of production and consumption and heavy reliance on fossil fuels‘. Monica Minnegal and Peter Dwyer (2008) discuss the reaction of fishermen in Gippsland (Victoria) to the uncertainties in their environment‘, and Deborah Bird Rose (2008) and Sandy Toussaint (2008) talk about the contemporary experiences of Aboriginal communities whose futures might ultimately be shaped by it‘ (Baer, 2008).

Since 2009 then, the anthropology of climate change has undergone rapid development, because people have become increasingly aware that climate change has had a huge impact on many people, including foragers, horticulturists, herders and Farmers, as well as coastal, riparian and anthropologists have studied urban dwellers for more than a century. For example, small-scale indigenous communities are facing rising sea levels, loss of freshwater supply or food supply threats due to increased drought, and the loss of familiar native species due to climate change. Indeed, for various societies, especially for survival and water supply, settlement methods and human health.

The AAA (The American Anthropological Association approved a; ‗Statement on Humanity and Climate Change, that starts with the leading paragraph: Climate change creates global threats that affect all aspects of human life, including our health, homes, livelihoods, and cultures, as well as our physical environment. Threats of his magnitude affect our stability – our sense of cultural identity, our well-being, and our security. As the discipline most clearly devoted to the human condition over time and space,anthropology offers important insights that can help create workable solutions to mitigate the impacts of climate change' (American Association Anthropology, 2015).

Anthropologist Suzan Crate points out: ‗The risk of potential relocation and migration at local, regional and international level. She thinks it is because of the breakdown of locally situated environmental knowledge. As her emphasis; climate change is forcing not just community adaptation and resilience, but also relocation of human, animal, and plant populations. Lost with those re-locations are the intimate human-environment relationships that not only ground and substantiate indigenous worldviews but also work to maintain and steward local landscapes. In some cases, moves also result in the loss of mythological symbols, meteorological orientation, and even the very totem and mainstay plants and animals that ground a culture' (Crate, 2009, p. 147).

Due to changes in climate the fishing communities are in the world are severely affected because they have dependence on natural resources such as river waters, forests and Wilde animals. Wolf and other co-authors stated about this; ‗The fishing community is one of the most vulnerable in the area. Fishing is becoming difficult as resources are dwindling. Current measures being adopted to enhance their income security have fallen short of addressing the roots of vulnerability. In the existing 276 international river basins, the increase in water variability projected by most climate change scenarios may present serious challenges to riparian' (Stefano, Duncan, Dinar, Stahl Kerstin, Ztrzepek and Wolf, 2012, p.2).

The intensity of climate change are results in the form of extremes availability of water and floods; ‗Climate change affects precipitation patterns and river runoff, thus increasing the vulnerability of certain regions and communities to changes in water availability and hydro-logical extremes' (Bates, 2008). According to Intergovernmental Panel on Climate Change (IPCC) the climatic changes will affect the rivers; ―The predicted effects of climate

change may render future river flow variability outside the bounds of previously observed runoff events" (1PCC, 2007, p.31; Milly, 2008). Further to explain the climatic impacts on different sectors IPCC stated that: ‗Drought-affected areas are projected to increase, adverse impacts on multiple sectors (such as agriculture, water supply, energy production, fisheries and health) will likewise rise. Increased flood risk will also pose challenges to society about physical infrastructure and water quality' (IPCC, 2007, p.49).

One of the most inhabited parts in the global, South Asia is also the place to a few of the global's miserable people, those probable to be hard smashed through changes in weather and climate. In South Aisa, there are many causes of the under-discussed problem not only climate change. The most significant factor is: Is climate change the significant problem impacting and affecting rain and river water sources systems present and in the upcoming? Is economical improvement, moderate land, the state with the low population growing and comparatively firm land use, the climate looks to have so become the principal origin of the strain.

Nevertheless, in Pakistan, the fast development of municipality population united with the increase of agribusiness, the development of the commercial enterprise, and the addition in financial gain have accumulated the economic process for freshwater in many ways. These method acting are more than straight, and at least for the time being. Influence the impact of climate change.

Pakistan faces major climate-related risks, including the melting of glaciers, monsoon changes, flooding, seawater intrusion, rising average temperatures, rising sea levels, and frequent droughts.

In 2017, USAID issued a report encompassed the losses of 2010 Super Flood in Pakistan, rainfall in 2011, sea level and increasing temperature; ‗In 2010, floods affected more than 18 million people in Pakistan and caused an estimated US$10 billion in damage. Abnormally heavy rainfall in the 2011 monsoon affected 9.7 million people in Sindh and Balochistan. Sea level rise and saline intrusion are threatening infrastructure and agricultural land in the Indus Delta. Temperature rises in Pakistan from climate change are projected to exceed global averages, with water scarcity to become more severe' (USAID

2017). These circumstances endanger both contemporary economical sphere and conventional sources of income , including fishing and agriculture.

In Pakistan, there are three types of fisheries, marine, inland and farm base fisheries. The marine fisheries commonly do in the coastal areas of Sindh and Balochistan. The inland and farm base fisheries are done in four provinces including Kashmir. In 2016, Food and Agriculture Organization (FAO) Pakistan estimated the fisheries contribution in Pakistan Economy; ‗Marine fisheries are a significant economic activity off the coasts of Sindh and Balochistan, while aquaculture and inland capture fisheries are found in all provinces of Pakistan. Fisheries production totals about 620,000 tons annually has an estimated market value of US$650 million, but a considerable proportion, particularly from inland subsectors, is not commercially traded. Approximately 17 percent of total production is sold to foreign markets, generating US$350 million annually in export earnings. Fisheries currently contribute only 0.4 percent of gross domestic product (GDP), and the sector‘s approximately US$350 million of exports appears to have plateaued‘ (World Bank, 2018, p.20).

The river ecosystem resides in the river and is restricted. They include sediments, rivers, forests, and living things, which together represent the nutritional unit of fish. The Indus River is the sixth largest galaxy in the world and has one of the large canal irrigation systems based on gravity. ‗Of its total length of 2,800 km, 2,682 km lies in Pakistan. The river is critical for Pakistan‘s 193 million people, irrigating 80 percent of their 21.5 million hectares of agricultural land. The river watershed is an area of rich biodiversity, with the Indus River Delta being particularly productive for fish. Inland capture fisheries produced about 130,000 tons in 2015, 21 percent of Pakistan‘s total‘ (World Bank, 2018, p.22).

According to WWF (World Widelife Fund) inland fisheries in mostly areas of Pakistan carried out in streams, canals, rivers and so on. ‗Inland capture fisheries produced about 130,000 tons in 2015, 21 percent of Pakistan‘s total. Inland fishing, which in many regions is a traditional practice, is undertaken in rivers, irrigation canals, and reservoirs, and generally serves subsistence needs. An estimated 186,000 people take part in inland fishing in Pakistan, many of them very poor. For example, more than 60 percent of fishing households in communities in the Indus Eco-region are living below the poverty line‘ (WWF 2015), equivalent to about US$60 per month. For many fishers, loans (at high

interest rates) are essential to smoothing out household consumption across the season‘ (World Bank, 2018, p.25).

Detailed socio-economic surveys conducted along the River Indus for Chashma and Taunsa - Punjab and Sukkur - Sindh (2012) by WWF – Pakistan reveal that monthly incomes of fisher households (with an average household size of 7) is around PKR 2,000 which in US $ is estimated to be around US$20. Around 75% (WWF – Pakistan surveys) of the population in target communities lies below Pakistan‘s poverty line of US$60 (PKR 6000) per month per person (2012-13). Fisher communities face a multitude of challenges such as social exclusion in some areas due to their ethnicity and caste; Insufficient infrastructure (such as landing sites, chilling units, and roads) and; lack of access to capital and poor investment in the sector which has forced many fisherfolk to seek underpaid manual labor as a source of income or to migrate to other water-bodies, which often leads to further entrapment in debt. The multi-purpose usage of freshwater (for power, irrigation, leisure, etc.) also means that fisheries services have been neglected or not valued highly and as a result, very little effort and resource has been allocated to management of inland fisheries.Fishing, which is their main livelihood source, is also known to be particularly susceptible to climate change, as erratic rainfall significantly affects fish breeding patterns and their success rates and there are currently no interventions in place to assist fisher communities in managing such changes or the over-exploitation of fish resources‘ (WWF, 2015, p. 20).

Inland fishing administered in various ways by several departments of the government such as in Punjab - Punjab Forestry Wildlife and Fisheries Department to control rivers, lakes and some reservoirs in Punjab. It is relying on kind of water sources, area of the region.

Currently, most inland capture fisheries operate under a contract system, which auctions fishing rights in public water bodies. These leasing and licensing mechanisms are designed to promote fisheries management and generate income. Motivated by strict revenue targets, the Punjab government auctioned the rights of more than 400 water bodies. The mobile water system is leased once a year, and the static system is leased once every three years. In Sindh, the leasing system for large water bodies has been replaced by a permit system for individual fishermen. However, the system does not provide incentives for long-term

management, including the stocking of juvenile fish into water bodies. The sub-contracting of inland fisheries is not allowed, but subcontracting has been reported. Bidding requires a lot of money, which limits the participation of wealthy people. Then, individual fishermen can go to work for the winning contractor or obtain a fishing permit in exchange for a portion of the catch or income. In order to maintain inland fisheries, water bodies are replenished by fisheries departments or fishing contractors‘ (World Bank, 2018, p.25).

Pakistan‘s fisheries face the particular effect of climate change. Accumulated seawater invasion in the Indus Delta has dilapidated fish fruitful beds. High temperatures decreased river flowing, farther harmful the choice of the delta‘s environment. Concerted result regarding changes in climate specifically major changes about day to day about weather and climate. The pressing on fishery beginning has accumulated the exposure of agrarian people that rely on that resource.

_The consequences of climate change on fisheries and fishing communities, the relationship goes both ways - on a global level fisheries can have implications for the climate. Under good conditions, aquaculture and capture fisheries can produce protein that has a smaller carbon footprint and a much lower terrestrial impact than other food systems‘ (Nijdam , 2012). Cumulative dependence on fisheries (for example, as opposed to farms that produce red meat), especially plant-fed aquaculture, provides a way to obtain low-carbon nutritional products. However, the impact on the general situation must be handled carefully.

_Women are important actors in fisheries and aquaculture, particularly in small-scale operations. In the pre-harvest stages, women repair fishing gear and prepare aquaculture ponds, and to a lesser extent, take part in the fishing itself. Women‘s role in fisheries and aquaculture is often greatest in the post-harvest stages, such as in cleaning, processing, and distributing the catch. Women can suffer under many of the broader challenges that the fisheries sector faces‘ (Ghaus, 2015).

1.2. Anthropology and Climate Change

_Increasingly, anthropologists are encountering the local effects and broader social, cultural, economic, and political issues of climate change with their field partners.

Wherever we go and work, we encounter people telling similar accounts of the changes they notice in the weather and climate‘ (Crate and Nuttal, 2009, p. 9) .

Everywhere, from high-latitude taiga and tundra regions, to high-altitude mountain ecosystems, from tropical rain forests to near sea-level coastlines, there are compelling similarities in the narratives, accounts, and experiences of indigenous and local peoples who are already seeing and experiencing the effects of climate change. For them, climate change is not something that may happen in the near or far future but is an immediate, lived reality that they struggle to apprehend, negotiate, and respond to. The weather is increasingly unpredictable and people express concern that local landscapes, seascapes, and icescapes are irreversibly changing. We, with our field partners, are also encountering the local manifestations of this global phenomenon. And, like them, we are confronted with the challenge of comprehending and responding to it‘. (Crate & Nuttal, 2009, p. 9)

Here Barth (1969) is also a major reference on culture and ecological boundary maintenance. Many of these earlier theoretical approaches were modeled on the natural science paradigms of rationality and objectivity. Some examples include the ―culturology‖ of neo-evolutionist Leslie A. White (1959), who elaborated lineal stages of cultural development on the basis of quantifiable energy consumption; Roy Rappaport‘s application of the biologically derived ecosystem, delineating human beings as competing against many nonhuman populations and performing religious rituals to maintain ecological balance (1968); Marvin Harris‘s cultural materialism that posits culture to be result of constantly optimizing human efforts of ecological adaptation (1979); and Julian Steward‘s theory of cultural ecology, focused on the interdependence and interaction between nature and culture as an incitement for technical innovation and culture change‘ (1955). (Crate, 2011, p. 177-178) (176-194)

Global climate change—its causes, effects, and amelioration—is intimately and ultimately about culture. It is caused by the multiple drivers of Western consumer culture, it transforms symbolic and subsistence cultures , and it will only be forestalled via a cultural transformation from degenerative to regenerative consumer behavior. Accordingly, anthropologists are strategically well-placed to interpret, facilitate, translate, communicate, advocate, and act both in the field and at home in response to the cultural implications of unprecedented climate change‘. (Crate, (2008), p. 569-595)

One challenge for anthropology is to address the security dimensions of climate change. The most obvious issues include humanitarian aspects, political and security risks, conflicts over resources, border disputes, tensions over energy supply, migration, political radicalization, structural violence, and tensions between different ethnic and religious groups. However, the anthropological gaze needs to also settle on the governance of national and international security issues, and the tools, instruments, and institutions utilized by states within a broader context of policy and practice‘ (Crate & Nuttall, 2009, p.12).

Indigenous peoples themselves may argue that, despite having contributed the least to greenhouse gas emissions, they are the ones most at risk from its consequences due to their dependence upon and close relationship with the environment and its resources. Their livelihood systems are often vulnerable to environmental degradation and climate change, especially as many inhabit economically and politically marginal areas in fragile ecosystems in the countries likely to be worst affected by climate change. Massive changes in ecosystems are occurring and have in many cases been accompanied by opportunistic and often environmentally devastating resource exploitation. To indigenous peoples this means that climate change is not something that comes in isolation; it magnifies already existing problems of poverty, deterritoriality, marginalization, and non inclusion in national and international policy-making processes and discourses‘ (Crate & Nuttal, 2009, p.12).

In Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change, Moser and Dilling (2007) forefront stories of success in communication and social action on climate change. They predicate the volume on the (to date) ineffectiveness of communication that has prevented the general public from understanding and taking action against climate change to bring to light effective modes of communication to quicken those processes. They argue that effective communication that mobilizes action must engage relevant social and cognitive characteristics. The volume distills the scholarship of both practitioners and an interdisciplinary research group to offer improvement on current communication strategies that empower individuals and communities to act in response to climate change‘ (Crate & Nuttal, 2009, p.19).

_The cultivation of particular beliefs, attitudes, and actions with respect to a category termed _the environment‘, often for purposes of the state – a process that Arun Agrwal (2005), building on Foucault‘s concept of governmentality, has termed _environmentality‘ is a critical, though difficult to study, element of the sociocultural dimensions of climate change‘ (see, e.g., Backstrand and Lovbrand 2006; Herbert-Cheshire 2000). (McCarthy, Chen, Carr, Louise & Walker, 2014,p.671).

_A focus on individuals – always in specific social and cultural contexts – think, feel, and make decisions means that ethnographic and other qualitative methods are particularly important in this research domain. Yet it remains difficult to articulate the findings of such methods with quantitative, modeling approaches that have dominated work in the field this far. Other researchers view changes in subjectivities as questions amenable to relatively about changes in rainfall or other weather, for example, are objectively relatively accurate or inaccurate, and it is possible to tease our from quantitative and survey data the effects on such beliefs and perceptions of factors such as exposure to mass media, political beliefs, and general discussions about climate change‘ (Frank et al. 2011). (McCarthy Chen, Carr, Louise & Walker, 2014,p.671).

_The environment‘ has taken on all the prominence and pervasiveness of social class, gender, and race, both as an issue in public life, and a concept at the center of a considerable amount of anthropological analysis (Baer and Reuter 2011; Baer and Singer 2008; Kopnina and Shoreman Ouimet 2011; Milton 1996, as cited in Peace, Connor & Trigger, 2012, p.218).

_A sub-disciplinary field of environmental anthropology has taken over the past couple of decades. From the mid-twentieth century, the relationship between culture and ecology came to the forefront in the field of ecological anthropology. Culture, both material and symbolic, was analyzed as an adaptation to the wider environment of geographically located population groups, and various deterministic and functionalist models became a prominent concern as exemplified in the work of Julian Stward (1955), Roy Rappaport (1967) and Marvin Harris‘ (1968). (Peace et al., 2012, p.218).

_Steward develop the influential approach, termed *cultural ecology*, which posited multilinear evolution as the mechanism by which specific societies developed in complex

ways shaped not only by the physical environment but also by technology, economy, religion, and interactions with other social groups. This earlier body of work in ecological anthropology laid a foundation for anthropology‘s more recent engagement with environmental issues associated with globalization and development, especially in the postcolonial societies of the global south‘ (Kottak 1999 as cited in Peace et al., 2012, p.218).

‗Ethnographic studies of sustainable livelihoods and indigenous environmental knowledge among hunter gatherers, small-scale agriculturalists, pastoralists and fishers have become a valuable if somewhat romanticized source of inspiration for contemporary environmentalists‘ (Brosius 1997; Hames 2007, as cited in Peace et al., 2012, p.217)

‗Often included in the broad category of ‗new social movements‘, environmentalism gathered pace in the late twentieth century‘ (Rootes 2007). ‗Anthropologists continued to undertake in-depth ethnographic studies of environmental issues, as well as becoming more engaged in interdisciplinary and environmental policy research. Post-structural though has also moved through environmentalism as a cultural phenomenon itself‘ (Kopnina and Shoreman Ouimet 2011). ‗Perhaps the most important distinguishing feature of anthropological approaches is the inductive way in which scholars are able to think about the environment in its broadest sense of ‗that which surrounds‘ (Milton 1996: 115). The anthropological importance on the common fundamental law of social group and nature through human-environment relation wants to question ethnocentric adopt about such multiple class as quality/society, human/non-human and native/alien, serve a procedure of social inquiry and cross social comparison. (Peace et al., 2012, p.218)

‗Much work by anthropologists focusing on particular environmental themes such as weather and climate change lends itself to interdisciplinary collaborations. Stephen Rayner and Elizabeth Malone led the way in policy-oriented interdisciplinary climate change research with the compendious edited volume, *Human Choice and Climate Change,* published in 1998. Most anthropologists contributing to policy research, in domains such as natural resource management and climate, work in interdisciplinary teams and take an ‗adaptation‘ approach which focuses on ‗accommodation to the unavoidable consequences‘ of global warming and other environmental changes‘ (Pokrant and Stocker 2011, p. 180 as cited in Peace et al., 2012, p.218)

‗A different form of engagement can be found in the recent collection assembled by Susan A. Crate and Mark Nuttall (2009), titled *Anthropology and Climate Change: From Encounters to Actions,* where the editors and many of the contributors espouse participatory action research in collaborations with their ‗research partners'. This work conceptualizes climate change as a ‗threat multiplier' which magnifies and exacerbates existing social, economic, political, and environmental trend, problems, issues, tensions, and challenges' (Crate and Nuttall 2009, p. 11, as cited in (Peace et al., 2012, p.219)

‗If environmentalism is identified, for the purpose of studying it, as a social movement of political ideology, we are precluded from considering what else it might be, how else a concern to protect the environment might be expressed. Our analysis is constrained by what we know about social movements and ideologies. If environmentalism is identified as a cultural perspective, we can ask ----under what conditions it might be expressed as a social movement or an ideology. These phenomena are seen as types of environmentalism, or form it might take" (Milton, 1996, p. 104 as cited in (Peace et al., 2012, p.220)

1.3. Pakistan's Policies for Climate Change

The Pakistan Climate Change Act, 2017 section ‗2' its clause ‗D' define climate change as, ―climate change" means a change in the climate system which is caused by, significant changes in the concentration of greenhouse gases as a direct or indirect consequence of human activities and which is in addition to natural climate change that has been observed during a considerable period' (Pakistan Climate Change Act, 2017).

―Pakistan's vulnerability to climate change impacts is well documented and acknowledged" (GOP, 2012). ―In the past decade, recurrent spells of extreme weather events such as floods, droughts, glacial lake outbursts, cyclones, and heat waves have taken a heavy toll on both life and property and adversely affected the country's economic growth. The super flood of 2010 alone, for instance, killed 1,600 people, inundated an area of 38,600 square kilometers" (km2) (A, 2013). ―Similarly, the Karachi heat wave (June 2015) led to the death of more than 1,200 people" (Q.Z, 2015). ―Studies and assessments undertaken by the National Disaster Management Authority (NDMA) show that extreme climate events between 1994 and 2013 have resulted in an average annual economic loss of almost US dollars 4 billion. The last five floods (2010-2014) have resulted in monetary

losses of over US$ 18 billion with 38.12 million people affected, 3.45 million houses damaged and 10.63 million acres of crops destroyed" (UNFCCC, Pak-INDC). These unfavorable effects of climate change are not in the far future but are at hand. So, these are not yet happen as Pakistan has started troubled with ever-increasing frequency and fear of climate-induced calamity.

The 2012 National Climate Change Policy (NCCP) is a written document of the country's directional policy on climate change. It recognizes the increasing danger of the biggest natural hazard due to climate change and elaborates on the risks faced by various fields. There are nine major climate hazards most famous in the policy documents. The 2012 National Climate Change Policy (NCCP) is a written document of the country's directional policy on climate change. It recognizes the increasing danger of the biggest natural hazard due to climate change and elaborates on the risks faced by various fields. Danger. Region and socioeconomic class. There are nine major climate hazards most famous in the policy documents. Among them one of, ~~in~~creased intrusion of saline water in the Indus Delta, adversely affecting coastal agriculture, mangroves, and the breeding grounds of fish (GOP, 2012).

1.4. The Indus River and Climate Change

Pakistan is one of the fewest dry and water-stressed state in Asia, and afterwards, it's founding in 1947, the government has built tremendous provision web, considering two big dams, many barrages (sub-dams), and thousands of canals to fitting its food product need. In the state of Sindh, the only root of agribusiness is Indus river (or River Sindh, as it is locally known), which water thousands of acres of farmland. However, climate change is causation wave to this free-flowing river.

'The western and southern segments of the country represent the Indus River basin plain and Balochistan Plateau. The trans-boundary Indus basin covers 520,000 km2 or 65% of the country's total area, including the whole provinces of Punjab, Khyber Pakhtunkhwa, most of the Sindh territory, and the eastern part of Balochistan . The Indus Basin Irrigation System is the global largest immediate provision system, accountancy for 95% of the country's total irrigation system' (FAO Aquastat Data Portal).

_On Indus River effect of the climate change is not a new phenomenon, and first instance of this was noted in Holocene period. The social history of the Indus River is, in fact, starts with the history of India. The Indus Valley Civilization, which existed from 5500 BCE to 1800 BCE, was complex in nature, and its inhabitants developed urban dwellings that included wells, bathrooms, and well-established drainage system. In this Holocene period, people of Indus Valley Civilization developed complex-structured cities like Mohenjo-Daro and Harappa, traces of which can still be found in present-day Pakistan. As the rise of the Indus Valley Civilization is linked with the river, so it's declined. Earlier archaeological records suggested that its decline of was linked with many floods that gradually impacted the agricultural and economic activities, and the civilization disappeared'.[2] _However, more recent scientific studies link the decline of the Indus Valley Civilization with climate change: drought, changes in rainfall pattern over the Indus river watershed, and gradual changes in monsoon pattern'.[3] This all restricted farming and destabilized the urban population. Now, about 4000 years after the disappearance of Indus Valley Civilization, the river faces the threat of climate change, and its most severity'.

_The present epoch is arguably Anthropocene—a time when the environment is at grave risk because of human-made changes in the industrial era. The idea of climate change—a part of Anthropogenic thesis—is based on the assumption that global warming is generated due to excessive accumulation in the atmosphere of greenhouse gases produced mainly through the burning of fossil fuel and the industrialized use of animal stock by human beings' (Chakrabarty 2009: 198). _Such global warming commenced as early as the mid-19th century, and causing not only increase in the sea level but affecting the hydrology cycle of fresh waters (Abram et al. 2016). The river Indus, which is based on the melting of ice and glaciers of Himalaya, are now becoming seasonal rivers. The melting of winter snow occurs earlier in spring, leading the peak river runoff to winter and early spring, rather than from summer and autumn when the water is needed most for irrigation and

[2] https://anthrosource.onlinelibrary.wiley.com/doi/pdf/10.1525/aa.1964.66.2.02a00040 (This is an article, giver proper reference)

[3] https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2002GL016822
http://www.pnas.org/content/109/26/E1688.short

other purposes‘.[4] This all result the Indus River, and both human and non-human communities that are dependent on it to become vulnerable of severe climate change.[5] The government is ill-prepared for this grave threat, and the species are unaware of any climate change adaptation strategies‘.[6]

Where climate change seriously affects human lifestyles, the behavior of rivers is dynamic. Like another river in Pakistan, the Indus River is also considered a living entity with its emotions, preferences and behaviors. In local myths and traditional knowledge, the Indus requires human beings to continue on their way forward, and when India‘s needs are not met, it will retaliate in the form of droughts and floods. Even today, people still speak of the Indus as a spirit, conscious, and communicating with people in their own way.

Communities that are heavily dependent on the Indus River from many generations have developed a close knowledge of the pattern, flow, and rise and fall of the river. The Sindhu (or the Indus River) is considered in an agreement with people for its flow, and now, with all these man made changes from construction of dams to unnecessarily polluting the water, is believed to be breaking its agreement. Considering the free-flowing river as a living entity is not something new, many other rivers are considered same in different regions of the world, and some have even been legally recognized for this (see the case of Whanganui river, New Zealand, and Ganges and Yumana rivers, India).[7]

Due to the impact of climate change, fishermen who depend on the rich resources of the Indus River are now facing a strained river. As the root of the river is affected by climate change, fishermen must adapt to the local structure to deal with this problem. This is the purpose of my research, which aims to study the impact of climate change on the

[4] http://meteora.ucsd.edu/cap/pdffiles/barnett_warmsnow.pdf

[5] http://acikerisim.bahcesehir.edu.tr:8080/xmlui/bitstream/handle/123456789/1056/AE0089.pdf?sequence=1

[6] https://www.sciencedirect.com/science/article/pii/S0022169404002872

[7] https://www.theguardian.com/world/2017/mar/16/new-zealand-river-granted-same-legal-rights-as-human-being

https://www.theguardian.com/world/2017/mar/21/ganges-and-yamuna-rivers-granted-same-legal-rights-as-human-beings

fishermen in the Indus River and analyze their adaptation plan in the Layyah area. However, I clarified my research question earlier, so it is important to conduct a detailed literature review on this issue.

1.5. Theoretical Framework

The earth has progressed from one geological epoch to another—recently from the last Ice Age (the Pleistocene period) to the more current and warmer Holocene. Due to anthropogenic climate change, the Holocene period is considered to have ended. The burning of fossil fuel and other related activities have become a geological agent on the planet earth. According to scientists, human now act as the main determinant of the environment of the planet, particularly after the industrial revolution of the 18th and 19th centuries. This all has now pushed us to enter in to a new geological era is called Anthropocene.

In the Anthropocene, climate change is an urgent and pressing issue. Around the world, social scientists are trying to understand this phenomenon and describe the causes and effects of climate change. Based on their research results, they have developed specific solutions for indigenous communities to deal with climate change. They studied the drivers and human influences of climate change, and discussed strategies for dealing with climate change? In most cases, they have responded through a governance system that mitigates the effects of climate change.

Climate change has threatened global livelihoods while causing hunger, water shortage, floods, droughts, famines, health, housing, internal migration, occupational changes and culture. These threat are affecting stability, occupation, and cultural identity, as well as caused gender discrimination, and increased violence and insecurity. As a field, anthropology has always provided important insights that can help create viable solutions to mitigate the effects of social problems. This is now an urgent task of anthropologists to develop strategies for countering the effects of climate change.

For the theoretical descriptions and explanations, the concept _anthropogenic‘ (human-caused issues), and the era _Anthropocene‘ was famously presented by a Nobel laureate chemist, Paul J. Crutzen and his collaborator, Eugene F. Stoermer. Crutzen

conception of anthropogenic is a broader term, which encompasses that all types of climatic activities are happening on the planet earth are human caused. Such concepts leads us to discssus issue of climate-change adaptation at the local level. How the indigenous communities are affected by the anthropogenic activities of developed nations? How and what strategies are being adopted by the indigenous communities that can addressing climate change? It is crucial for us to return to basics of climate change and mitigate it through native communities by developing on their thousands of years of experience.

The concept of anthropogenic further discussed and explained by prominent Indian historian, Dipesh Chakrabarty. In his two famous essays, _The Climate of History‘ and _Climate and Capital‘, he talks about the anthropogenic effects on the planet earth. He argues:

> _To deny that global warming is real is precisely to deny that humans have become geological agents, changing the most basic physical processes of the earth‘. (Chakrabarty, 2009, p. 206)

Developing on the works of Oreskes, Chakrabarty (2009) further states:

> For centuries, scientists thought that earth processes were so large and powerful that nothing we could do could change them. This was a basic tenet of geological science: that human chronologies were insignificant compared with the vastness of geological time; that human activities were insignificant compared with the force of geological processes. And once they were. But no more. There are now so many of us cutting down so many trees and burning so many billions of tons of fossil fuels that we have indeed become geological agents. We have changed the chemistry of our atmosphere, causing sea level to rise, ice to melt, and climate to change. There is no reason to think otherwise. (Chakrabarty, 2009, p. 206)

Chakrabarty continues to argue:

> _Furthermore, mankind releases many toxic substances in the environment. The effects documented include modification of the geochemical cycle in large

freshwater systems and occur in systems remote from primary sources. (Chakrabarty, 2009, p. 219)

The Anthropogenic global warming brings in place difference of opinion or contradictions regarding three histories that form the point of view of human history. These are usually considered separate from another for all practical purposes. First, the history of the earth system. Secondly, the history of life including that of human evolution on the planet. Lastly, the more recent history of industrial civilization. According to Chakrabarty (2014),

_Humans now unintentionally straddle these three histories that operate on different scales and at different speeds. The very language through which we speak of the climate crisis is shot through with this problem of human and in- or nonhuman scales of time‘ (Chakrabarty, 2014, p.1)

The problems that produce climate change reflect on very different and incompatible scales of time. The policymakers and specialists make a plan in terms of years, decades and centuries. On the other hand, politicians just think in terms of their electoral cycles or elections. Talking about local and global politics, Chakrabarty says,

_This is another reason that makes it difficult to develop a comprehensive political committment for climate change‘ (Chakrabarty, 2014, p.1).

On the climate change problem in the existing literature, significant gaps open up such as between cognition and action. According to Chakrabarty ,

_These gaps or openings in the landscape of our thoughts rifts because they are like fault lines on a seemingly continuous surface; we have to keep crossing or straddling them as we think or speak of climate change‘ (Chakrabarty, 2014, p. 3)

There are three rifts; firstly, various governments of probability that regulate everyday lives in contemporary economies and have to be supplemented by knowledge of the radical uncertainty of the climate. Secondly, divided human lives having to be supplemented by the collective life as a species, a dominant species, on the planet. Last but not the least, the

inevitably anthropocentric thinking for forms of disposition towards the planet that do not put humans first. According to Chakrabarty,

> ‗Human beings have not yet overcome these dilemmas to settle decidedly on any one side of them. They remain rifts' (Chakrabarty, 2014, p. 4) .

The climate change gives birth to large and diverse issues of justice like justice between generations, between small indigenous or island-nations, between developed, industrialized nations and the newly industrializing. According to Peter Newell and Matthew Paterson express, ―it is clear that some people and countries contribute to it disproportionately, while others bear the brunt of its effects". They further say,

> ‗Is that it is the people that will suffer most that currently contribute least to the problem i.e. the poor in the developing world. Despite often being talked about as a scientific question, climate change is *first and foremost* a deeply political and moral issue' (Chakrabarty, 2014, p. 9)

2. AREA PROFILE

2.1. Physical Setting

Even the very initial and simple description of any human society would be incomplete without the discussion of location and natural environment. This alone being reasons enough for social anthologists to start their work with the knowledge of geographic setting of the research area.

Another important factor in this context is that social relations are influenced by environment. This general rule is more precisely applicable to people with little technological control over nature who must adapt themselves immediately to its demands, for instance, a year of bad rains ruining the harvest and bringing famine may demand of a community to live scattered among more fortunate neighbors or start living amidst foreigners. Such changes affect many social relationships. Moreover the study of natural environment is necessary because it influences patterns of diet, occupation, settlement and like. Therefore most of today‘s modern anthropological studies start with an observation of these geographical and environmental features and their consequent effects on the general life pattern of the community.

2.2. District Name “Layyah”

―Layyah derives its reputation and name from a chaotic brief esteem bush of fuel-wood usually notable as ―Layyan” (Tamarisk die). The region was first covered by the Layyan (shrubs), this name was given by the native people of the area. The area name is spelt as ―Leiah” in the British era. Layyah was given the status of the district on July 01, 1982, previously the district was a part of District Muzaffargarh as a Tehsil” (District Census Report, 1998).

2.2.1. District Layyah: A Brief History

In the previous centuries, the area of this district stayed under the Hindu Kingdom of Sindh. For a few time, it remained under the regulation of Arab victors that held Multan as well as Sindh. During 14th century conflict between Sumros and other tribes did not permit native people to set up. Subsequently, this period of time of lawlessness, the sphere of

Layyah district became taxable to the Governors of Mankera who was locally known as Nawabs of the Thal ((District Census Report, 1998)

2.2.2. Background of the Karor City and Hazrat Lal Esan (RA):

Karor Lal Esan or Kot Karor is a city of District Layyah in the province of Punjab, Pakistan. Its old name is Depal Pur. Administratively, it is subdivision of District Layyah and has 14 union councils. It is located on favourable location, on its west side the gigantic River Indus is flowing and on east side the Thal desert is located. It is surrounded by Dera Ghazi Khan on tis west, Dera Ismail Khan on its north west; district Bhakkar on its north. On its south district Layyah and Tehsil Chaubara lies on its south east.

The city is named after a saint, Hazrat Lal Esan,8 who, it is believed, recited karor (corer, or 10 million) times the Sura Yaseen, (a chapter from the Muslim Holy book, the Quran), while standing on foot in the Indus River to avert the flood that was threat to the town. The city, eventually, became famous as –Karor" - –Lal Esan". The exact date of the saint could not be pinpointed, however possibly he was died in 1430AD, while the shrine was constructed by Nawab Ghazi Khan Mirani.

2.2.3. Mela Chodhwein:

Festival –*Mela Chodhwein*" (or the festival of the 14th of the Moon), is held in Karor Lal Esan every year in September. This festival is celebrated in the memory of Hazrat Lal Esan. The festival showcases a number of events such as horse racing, tent pegging, camel fighting, bull fighting and racing, wrestling, kabaddi, *dodda*, cricket, football and many others.

[8] Hazrat Lal Esan was the grandfather of Hazrat Bahudin Zakarya Multani. Bahudin Zakarya was born around 1170 CE in Kot Karor (now known as Karor Lal Esan).

2.3. The Demography, Location, boundaries and topography of District Layyah

According to Pakistan Bureau of Statistics, the district total population as per In 2017 census is 1,824,230 (1.8 Million) while in 1998 its was 1,120,951 (1.1 Million). The Karor Lal Esan tehsil total population according to 2017 census is 594,639 (0.5 Million) and in 1998 it was 368,899 (0.3 Million). (Pakistan Bureau of Statistics, 2017).

Layyah district belongs to the Civil Affairs Department of Dera Ghazi Khan. It is located between 30-45 degrees north latitude and 31-24, and between 70-40 degrees and 71-50 east longitude. It consists of a semi-rectangular sandy land between the Indus and Chenab rivers in Sindh Sagar Doaba. In the north, the formed Bhakkar district is officially a branch of the Mianwali district. The Indus River is located in the west, and the Dera Ghazi Khan (Dera Ghazi Khan) spans the river. Jahng district is in the east and Muzaffargarh district is in the south. The area has a total area of 6,291 square kilometers and is divided into three subdivisions, Layyah, Karor Lal Eason and Chubara, with 722 income classes. It is 88 kilometers wide from east to west and 71.5 kilometers long from north to south.

Most of the area lies between the Indus and Chanab rivers. The Indus River flows on the western border of Layyah District. On the northern line of the area, the Thar Desert rises above the Indus River in a steep structure about 6 meters high. The river part of the area can be divided into three regions.

The first is the narrow area along the Indus River, flooded in summer, kharif crops cannot be grown, and rabbis can be matured through good irrigation. The second area is a low water logging area, where low-quality kharif crops can be planted on high ground. The third area is the irrigation water brought by river floods through the submerged canal. The head of the submerged canal is located on some small rivers. The entire area was a desert until Chashma and Taunsa Barrage on the Indus River built the Thal canal. The Thal Development Authority (TDA) has developed areas previously covered by sand dunes.

2.4. Fauna

Wolves and wild boars can be found nearly everywhere in the area, particularly in the delta and also western and eastern sides of the Indus River and forests. The only deer in the area is *parah* (deer). Ravine deer named *hiran* or *chinkara* have been found in the deserted land of Chaubara subdivision. Hare is usually found in flooded areas, higher than the surrounding environment. Also, wolves are abundant in plantations and crops by the canal. People often find hedges called Jhah locally.

2.5. Flora

The flora of this area is important. Water supply to the local area through rainwater and irrigation systems plays a vital role in the growth of the Sheesham tree (Dalbergia sissoo) that is all over the area. It has an essential function in the commercialization of local economic systems. Kikar (Gum Arabic) is also located in this area. Its wood is used as fuel and furniture. Farm tools are also made of Kikar wood. Sarin (Albizzia lebbek) is rarely found. Jand or Kana (Prosopis spicigera) is the most common tree in the area. Bailey (Zizyphus Jajaba) is a common large tree. People eat their fruit (beer). The beer is dried and used as a fruit.

2.6. The Village Shinah Walla in Historical Perspective

_During the interview, the village chief‘s oral history and opinions reached a consensus that the villagers graze bison in the grass. One day, their livestock and bison were attacked by a lion (Shina), and then the villagers rushed towards the lion. Killed them lion. From that day on, the village was first called "Shinah Mar" and then "Shinah Walla" or "ShenhanWalla". On the other hand, the village has no written history. The village has been born since ancient times. It is said that this village was built more than 900 years ago. Villagers suffer from floods every year and have been affected by river erosion for the past 50 years. The current location of the village ranks fifth among residents. The river water eroded the village and the villagers began to settle, for example, eroded the right bank of the river. They settled on the left bank of the river, but the villagers never moved

permanently or left the village. The first residents of the village were people Isra and Khokhar. The word "Shainh" Figuratively means the lion in Saraki and Punjabi. It is said that this village now has a lion sitting in the forest, so this place is called "Shinah Walla"‘(Village Elders Interviews).

2.7. The Demography, Location and Access to the Village

–According to Pakistan Bureau of Statistics (PBS) the village (block or mauza) Shinah Walla total population is 10,778 and households are 1641”. (Pakistan Bureau of Statistics, 2017). Shinah Walla (Shinah Walla) is placed adjacent the east side of the Indus River. It is approximately 10 kilometers from Karor Lal Esan in the west and 41 kilometers from Layyah district in the northwest. From the city of Karor Lal Eason, a Paka Road leads to the village. The village is located in the downward zone. Almost every year, especially in the summer, the river flows into several houses, crops and roads affected by floods every year.

Figure 1. village layout

The village is separated into different parts. The primary placement of the village is on the right side of *pakka* road, called main Shinah Walla. Almost landholders live there. Several

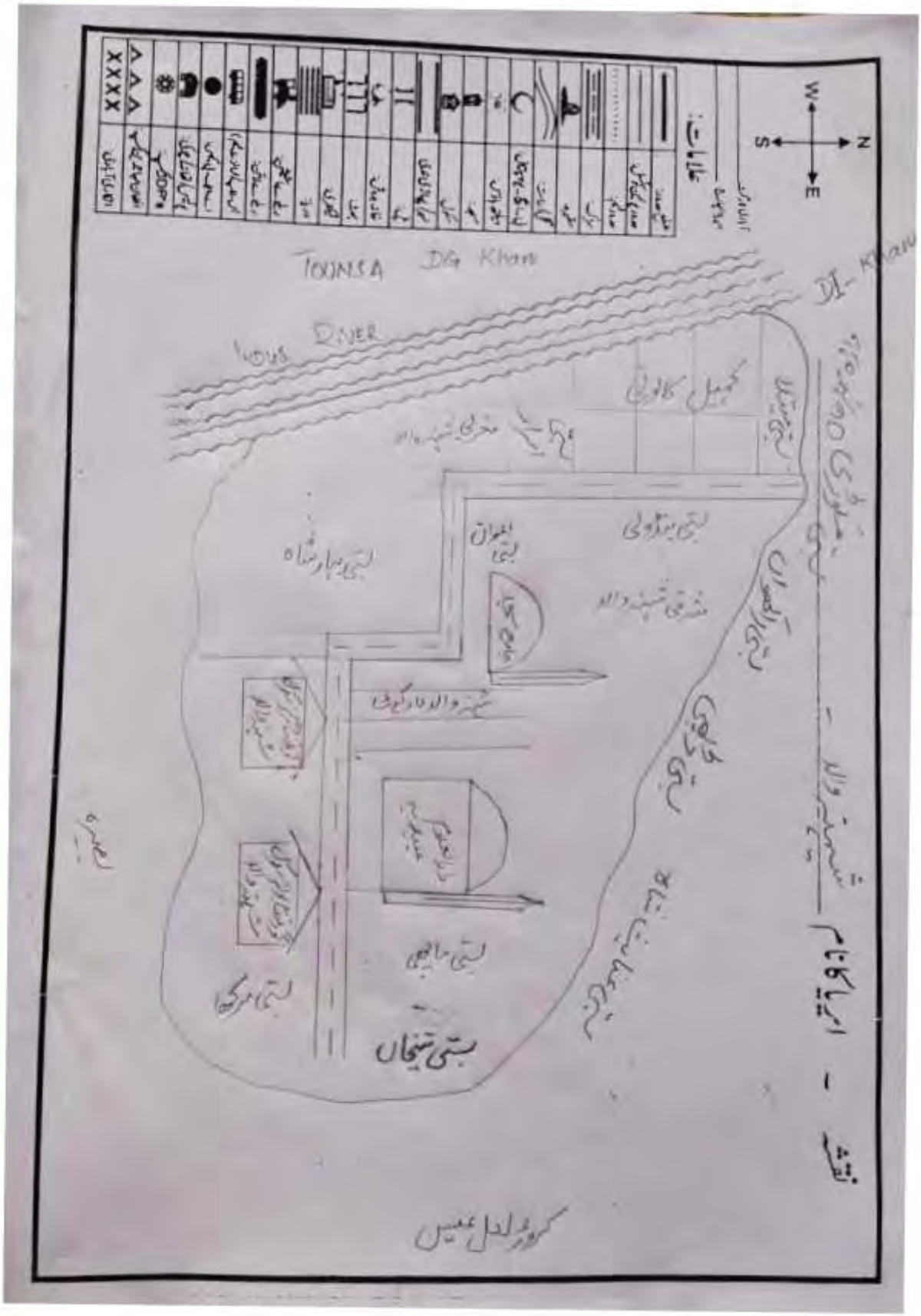
workers and working-class people also live there. This is the sphere placed on the low-lying level, which is why it can be flooded even if it was struck by many of the 2010 harmful floods. On the left and south of the village, most of its cultivated land. Basti Bahar Shah, Sohal and the village Laskani Walla are also there.

In the north of the village of Dahpi, Rakhwan, Makori and Wara Seharan. In the east, Basti Sheikhan and Inayat Shah and in the west there are houses of the fishing community under study. In 2010, the fishing community houses washed away and a local NGO with the support of donor build houses for them named Kehal Colony is located in the northern and western side of the village. The mighty and gigantic, the Indus River flows with its serene on the west side of the village.

From the city of Karor Lal Eason, which is ten kilometers away, to the Shinah Walla village in the urban area is a parka highway. This road is almost 35-40 years old and was severely affected by the 2010 catastrophic flood. After the 2010 flood, the road was not repaired. However, 3 kilometres of roads were rebuilt in 2017, and the other 3 kilometers were rebuilt in 2020.

In an earlier period, horses and camels were used for transportation, and they have now been replaced by modern vehicles. Before the truck in 2010, the rickshaw in the village passed through other villages to reach the city. After the floods in 2010, the government provided cash subsidies (Watan cards) to the people, and most residents bought motorcycles. As a result, personal motorbikes replaced van or rickshaws. Now, most people use a motorcycle and some uses rickshaw as a mean of transportation.

2.8. The Village Map



2.9. Rainfall and Climate

The sum of rainfall fall in the village is small. However, from the last two years, the number of rainfall increases and summer period of time extended that‘s why weather and cultivation and harvest practice dynamic quickly. The organization and frequency of precipitation are quite a day-after-day i.e. it goes on the seasons. Mean yearly precipitation does not overstep 18.7 centimeters of which primary cloudburst are practised in a summer calendar month. Aeriform arrangement of downfall is no so broad.

It always follows the thunder. In April, hailstorms are prevalent and quite intense. July and August are the rainy months, while October and November are the driest months. The collapsed structure has become a planet. The community realized that they could not predict rainfall as before. Extensive rainfall results occur outside the monsoon period: these results are the result of severe separation and can harm upright crops.

The climate of the village is cold and active in winter, with the coldest calendar months being December and January. In summer, many grainy storms give people a sultry and intense feeling, but they are less than the sandy tracks in the area. Burning weather is often referred to as "Lu" plus comfort, and it is often said to have a bad effect on the yield of arable land in sandy areas. One positive thing about Lu is that it burns mosquitoes and flies. On the eve, the area where the river flows becomes easier, and people especially the anglers on the sand and the sand becomes cooler. In winter, from here to the coldest "Kerala", there will be snow everywhere. Because of this kind of Kerala, no one dares to walk barefoot, and if they want to destroy the wheat and grass crops. Fog and smog prevail here and there.

It has been determined that in the past 40 to 50 years, the temperature in this area has risen to the extent that there is a significant temperature increase throughout the year. The masses observed that in this season, they no longer need to wear sweat, but in summer, the accumulation of heat begins. The reality proves this, people need a small amount of wood to realize the heating function in winter. During the summer rainy season, the community observed a slight cooling in the season. The increase in temperature shortens the growth time of crops by more than 20 days through the later sowing and the time before harvest.

2.10. The Population of the Village

The figure for households inhabiting in the community are 82 and their overall persons are 590 individuals. The women population was 287 and men population was 303. The ratio of the male population is more than 51.35% and the ratio of the female is 48.64 % in the village.

Table 1. **Village Population by Occupation**

Sr.No	Caste	Occupation	No. HHs	Male	Female	Total
1	Kehal	Fishing	63	235	223	458
2	Syed	Agriculture	08	28	26	54
3	Issrra	Agriculture	05	16	15	31
4	Mochi	Shoe-making	06	24	23	47
Total			82	303	287	590

Source: Village Field Survey, 2019

The village people of –Shinah Walla" are bifurcated into various recognizable occupation and castes which may be tagged on the ground of occupations and somehow ethnicity. All groups were opposite owing to its line of work or characteristics. Each social group may be classified into groups and castes on the ground of occupation. They are enclosed:

2.10.1. The Fishing Community - Kehal

Fishing provides an industry for a very large number of people. The fishing tribes - Jhabels, Kihals and Mors - live almost entirely by it, and other people take to fishing for support as well as amusement. (Gazetteer of the Muzaffargarh District, 1884, p.40). Kihals and Mors live by fishing, but some have taken to agriculture. They, as well as the Jhabels, are fond of cultivating *samuka,* a grain that is sown in the mud left by the retreating rivers. Theses tribes live separately in villages near the rivers, called *mianf* from me, a fisherman. (Gazetteer of the Muzaffargarh District , 1884, p. 79)

2.10.2. Syed

Syed is a spiritual and very respective social group of the village of Shinah Walla. They vestige their lineage from Hazarat Fatim (R.A), daughter of Prophet Muhammad Peace Be

Upon Him (PBUH). By convention, in this village, they rely on nazro-niaz (as a gift in the form of money) to obtain wealth. Masses from inside and outside the village; meet them to get *dam darud* and amulets or *taviz* to fulfil their wishes.

They are provided to Syed in the form of currency or grains and animals. Sometimes they pay at the same time, but others promise to pay in the future and their wishes are fulfilled. In Shinah Walla village, there is no holy land in the village, so these Said families mainly rely on "taweez" and income from today's agriculture to make a living. Over time, they acquired their own land, which is a symbol of prestige in rural communities, but they still enjoy a high status due to their religious ancestors. It is believed that they were found from a holy family. They are respected by the villagers.

2.10.3. Issraa

This was the primary socio-economic class or group in the village which have fundamentally own land. Issrra is a controlling caste and group and has less of the population. They pretended that they were from a single root or ancestor who had been established in the village from the time old. Their basic business is of cultivation. The elders' men of this caste told me that –when Hazarat Ali Rajan Shah came from Uch Sharif in Basti Rajan Shah, by sermon and preaching of that saint Irsrra entered in Islam. At local level politics, they play a vital role in the village.

2.10.4. Mochee

Their regular business is shoe making and shoe repair. They also have relationships with families that own land and Sepi who serve the landless. Traditionally, they make new shoes and can also be repaired like the *ulaag* system, but now, they make new shoes, and only *mochee* has repaired them on *sepi*. The leather he received was free, including the cost of dead animals or animals slaughtered in life cycle rituals. At that time, he gave away one or two pairs of shoes to his family for free, freeing his skin.

There are six families in the village. Two of these families live on the *sepi* system, while the other four are in new jobs and produce new shoes based on cost. This is also an ethnic group. Compared with other Kambi people, they have a lower status and sometimes they feel embarrassed by calling *chammers*.

2.11. Cultural Setting of the Village

2.11.1. Dress Pattern

Various dresses were used according to gender, age and location. Traditionally, men and women wear *kameez* and *dhoti*, while women's *kameez* and *dupatta* do not include design and colour. Women, especially young girls, have a dupatta on their heads, while men and young boys have *chaddar* on their heads. But with the passage of time, the style of the dress is changing. Now young ladies wear *shalwar* or gene and *kameez*, while older women wear the same regular dress style. The same goes for men.

Young boys who have been educated since childhood wear *shalwar* and *kameez* clothes and are adopted by young boys in the village. Most of them are outside the village for education or work purposes. Especially all of them have a *chaddar* cheese on their shoulders, which has many uses. According to an interviewee, it was used to cover the head and face to prevent heat and cold and rain, and it was also used as a floor for sitting and sleeping on the ground. In conflicts, transportation of feed and fuel, and many other functions, wrapping the head and important parts of the body is particularly useful.

In addition to clothes, women also use bracelets, murkiyan, nose needles, teeka, finger rings, hair clips, necklaces, etc. for decoration. The important item in women's clothing is gutt or paranda, which is known as a symbol of female dignity. Gutt is made of threads of multiple colours. The end of the knot is decorated with jewellery. Generally, the guts of older women are black, while the guts of young women are multi-coloured.

2.11.2. Food Pattern

The nutrient at the community can be separated into two kind. The first is day-to-day food, and the another is food for social occasions. The details of the two categories are as follows. As usual, breakfast includes lassi and yogurt, as well as rotten meat or fresh paratha from last night. But now tea is added to the breakfast, replacing lassi in some way. Lunchtime is from 10 am to 12 noon. Lunch includes *rotties*, *lassi* and sometimes curry.

Beans are used in curry in daily cooking. From a nutritional point of view, all these foods are very poor, but they are just to fill the stomach. Fruits are rarely used, but whenever a

city dweller comes to the village, he will bring some seasonal fruits. Children see most fruits as special things. Dinner began shortly after the sun rose. It includes curry and rot. Curry usually uses vegetables, potatoes and spinach. The meat is rarely cooked. Although people have chickens, they also cook vegetables occasionally, especially when someone is sick to replenish energy or when the chicken is sick, because don't let the chicken go to waste.

The second type of food is cooked for special occasions such as marriage, death, festivals, circumcision and other special functions. In these cases, meat and beets (short sugar) will be cooked. Specially prepared foods are consumed more than ordinary foods. Usually, people eat many plates of beets, rice, and meat in ways that many people cannot eat. For him, this is a good opportunity to seize as many opportunities as possible. There is usually diet competition between people under special circumstances.

2.11.3. Belief System

The entire population of Shinah Walla village belongs to the Islamic religion. The entire population follows Suni faction, they perform different rituals and act according to faction. But the main thing observed in the village is their belief and practice. We can think of it as the primary tradition plus the secondary tradition. The main tradition is the entire Islam or Muslim religion, and the secondary tradition is to change religious habits according to the local environment and customs. In order to adapt to the Islamic system, some local customs have been synchronized.

People believe in God, but they believe that different death or life pies around God can help us through a chaotic or difficult time. Show them their attachment, they visit them and the shrine. Believe them, they are all superstitious. In order to solve the supernatural phenomenon, rural community members used two methods. One is the direct method or prayer method, in which one person prays five times and calls the supernatural person to complete the prayer. Morvi of the mosque is the leader of this kind of prayer.

2.11.4. The basic facilities in the Village

People, according to Weber‘s New World Dictionary is defined as; ~~a~~ll the people who living together as a small social unit within a large one having interest and work closely

associated because of common tradition or political economic advantage". Therefore, a community consists of many family units living in a special area with communal interests and value systems.

2.12. Education

Pedagogy plays a vital role in improving local people. The level of education also indicates the structure and level of life in the community. The ever-increasing level of education means that social groups are on the way of improvement. In the village, two middle schools , one for boys and the second for girls. The boys' school has a history of more than 100 years, while the girls' school has a history of 50 years. Both boys' and girls' schools first established elementary schools, which were then upgraded to intermediate levels in 1992.

After receiving high school education, the boys had to go to Karor Lal Esan City, 12 kilometers away from the village. However, there are no girls' high schools near the village, so girls who have passed through eighth grade have to sit at home and get married. The education of boys is considered to be good and fruitful, but not for girls. Unfortunately, in both schools the children of the fishing community are not enrolled due to distance and poverty. There are not enough teachers in the school. These teachers want to work locally. The details of the enrolled students and teachers of both school in the village are as under;

Table 2. Government Schools

Sr. No	Name of School	No. of male Students	No. of female Students	No. of male teachers	No. of female teachers
1	Government Middle School for Boys	310	-	12	-
2	Government Middle School for Girls	-	244	-	07

Source: Government Boys and Girls Middle School's attendance registers, 2019.

Figure 2. village school

Government Girls and Boys Middle Schools Shinah Walla Karor Lal Esan District Layyah, 2019.

2.13. The Health Facilities in the Village

The people in the village don't care much about health because the people in the village work hard and use *desi* food. A person is taken care of when he is sick. It is believed that health measures to control the disease are not essential, and there is no need to munition children. Three treatments were performed on the patient. One is herbal medicine, in which *Hakeems* uses homeopathy to prepare medicines. The second is homeopathy using modern medicine. MBBS doctors were in the city, but disappeared in the village, they used homeopathy. He gave medicine and injected the people according to his knowledge. There are such distributors in the community. The flood caused an increase in the incidence of diseases. In the case of a long flood discharge time, most cases have reported diarrhea and gastrointestinal diseases, eye and ear diseases caused by water pollution and poor sanitation.

Only one midwife handles all childbirth cases, and if the situation is serious, the patient is referred to the district hospital Layyah or Nishtar Hospital Multan. The people are generally healthy. This is mainly due to the hard life in the village.

2.14. Mosques

In Shinah Walla village, most of the population is Sunni. In the past ten years, the village has a Jamia mosque and three small mosques, but as the population increases, the number of mosques has gradually increased. The number of mosques now is seven. These mosques regularly conduct religious education. Qari sahibs regularly teach the Quran to boys and girls and charges a certain price.

2.15. The Graveyard

In the village there is no graveyard from the time immemorial because almost every year the village is flooded. However, people bury their loved ones at the Darbar of Hazarat Lal Eason and Hazarat Ali Rajan Shah at Rajan Shah town. In most of riverine areas there are no graveyards because of flooding.

2.16. The Market

In the village, there is no main market or shopping center where everything available in one roof. There are few markets in the village where one can buy food items, stationary, shoes, tailor shop, sweet shop, motorbike workshops, LPG gas, medical store, milk shop, easy load shop, flour mills (atta chakki), hotel, agriculture related items i.e. fertilizers, pesticide, seeds etc. Human and animals medicines are also available in the market.

Figure 3. Village shops

2.17. The Role of Conventional and Social Media

Whether in educational institutions or at home, there are newspapers in the village. Televisions that provide highly entertaining resorts are essential resource. The cable system has changed the way, masses are watching dramas and other programs everyplace. This century is a century of advanced technology. Therefore, nearly 75% of young people use social media applications commonly known as Facebook, TikTok and Whats-App. The villagers formed a Whats-App group called "Shinah Walla Awami Group", and everyone has the right to raise his/her voice. Common issues that are often discussed are the erosion

of the fishing community houses, agricultural land, roads, hospital, upgradation of schools, library and community center at the village.

2.18. The Local Games of the Village

In the world, the communities spare some time for games whatsoever how busy they are for the purpose of mentally and body relaxation and refreshment. The indigenous people of the village played different games among them including cricket, volleyball, marbles or *chidday*, catch partridges in the nearby jungle in the month of *Chter* - *Vesakh* (March - April), hinting wild boars by horses, *chhla* - *poch* (hides and seeks of the coin in palm) and *pithu* - *garm* (usually girls play this game). The children used to fly kites because flying is the best pursuit of the villagers.

Figure 4. The village Children

2.19. The Local Justice and Politics

Pay attention to the local judicial and political system. The main judicial methods based on the "*sathh*" and "*panchayt*" should solve property and all other basic human rights-related issues or routine minor issues. The host‘s names are malik and sardar, and he is advised to make judgments on the quarrel and set small and big disputes.

The head of the "*sathh*" is usually appointed with the help of *beradri* and the economic situation of the village. Shinah Walla village is part of a large political system in the area. Therefore, people's need is to improve public safety. Most people in this village are illiterate and know nothing about the rest of the world. Some people are needed to deal with government agencies on their behalf. The local leaders of these villages provided help in this regard.

2.20. The Societal System and Organization

The societal organization and system are ever mention the means of fundamental interaction between the community,and culture.

2.20.1. The Social Unit

In the fishing community of Shinah Walla village, there is a group of close people. When a relationship is established through blood or marriage, it will cause emotional investment. In this community, most families are nuclear families rather than ordinary families. They like to form a nuclear society group, because in this community, the family is a unity of production, and every family member is human capital. Due to the poverty line, the entire family works together, and each family member must earn income for him and his family. They mainly live in the nuclear family system.

2.20.2. The Residential Pattern

The streets in the village are mainly *kachas*, except for one main street, which was made decades ago through the local political party and the rural development department. There is no specific arrangement for the outflow of water. During the rainy season, all *kachas* streets become muddy and difficult to cross. In the absence of necessary rainwater or daily

water outlets, one can see the muddy streets grow into mosquito nurseries. Like other villages in the area, there are many small functional departments here, and the village community members are more aware of their benefits. According to the informant, rainwater is stored in it every day for irrigation at odd times. In summer, the *chapper* of the village will help livestock, especially water buffaloes, because their black skin absorbs sunlight and is forced to escape from muddy water sources, especially in rivers. In summer, men and women sit in the *chapper*. Like streets, *chapper* is also a breeding grounds for mosquitoes and flies, which can bring many diseases to humans and animals.

Most of the houses of the village are *katchas* but rich families have *pakka* houses with concreted boundary walls. *Katcha* houses are made of wooden beams and *katcha* bricks or mud. A house usually has one big room, which is fined decorated by putting utensils on the cornice of the walls. All the family members, parents and children, sleep in this big room. There is a small room attached with the big rooms knowns as *kothi*, which is used as the store room in ordinary days. Usually deliveries are made in this small room. A small room is used as a kitchen in winter while cooking is made in the courtyard in summer. There is a room which is a meant for grain storage but in many houses no such room exists for this purpose and *pallas* are made for the storage of the grain.

Some houses have verandas which is a place for sleeping in the rainy season and resting place in the days of summer season. Houses have flat roofs which are used for night sleeping during summer season. Courtyard is a very important in the living pattern in the village. Most of the activities take place in the court yard. During the day, females gather in the court yard for knitting and sewing and doing their house hold work under the shady trees in the courtyard. The same compound is used for similar activities in the winter when leaves of the trees have fallen. Other activities making butter and Lasi, children bathing, washing of clothes, fodder cutting etc. take place in the court yard.

Conventionally, ventilation system is maintained in the construction of the house. Now a days mostly people are making windows, such innovations are restricted to guest rooms which are also a recent innovation. Construction of a *baithak* is a recent development introduce by the urbanized culture before this all villagers used a *dera* commonly at any time. Almost all the houses are surrounded by the *purdah* walls or constructed in a manner that back side of the rooms becomes the *purdah* walls. Usually common main gate is use

for people and the cattle. The process of constructive of *kacha* houses into *pakka* houses has been accelerated due to increasing the income of the villagers and modernity. People spend most of their money on the construction of *pakka* houses.

Some houses of made flush system, apart from making new houses, modern appliances and decoration pieces have been set in the house.

Figure 5. Village houses: A newly view of Kehal Colony built in 2010 super flood with the support of local and international organizations.

Table 3. Types and Numbers of the Houses

Sr. No.	Types of House	Total Number
1	Pakka	11
2	Semi Pakka	17
3	Kacha	54
	Total Houses	**82**

2.20.3. Land Use Pattern

The total area of the village is 1960 acres that is cultivated. It is divided into two main categories *mazora* and ghair *mazora*; *Mazora* is the land which is used for cultivation. Furthermore the *mazora* is divided into tow forms one is *khoi* is irrigated by wells and tube wells and second one is *baitti* is irrigated by river water or dampness or sometimes irrigated by rain falls. The *mazora* land is 1056 acres in which is khoi is 500 acres while baiti is 556 acres.

The *ghair mazora* is divided into two kinds, one is *sunj* (barren) and other is *abadi deh*. *Sunj* (barren) that type of land which is not use for cultivation. This type of land can be sandy or may have water logging or salinity or in the Indus River. This type of land seldom cultivated. The total barren land is 904 acres. *Abadi deh*, it is the land which cannot be used for cultivation in any way. This is the land which is covered by houses, shops, schools, mosques etc. the total area of this type of land is forty two acres.

2.21. The Livestock and agriculture

The livestock and agriculture is the main economical activity of the native of the village out of 82 households are landowners, while leftover is landless. All the land is cultivated but due to problems of water - logging and salinity, production has reduced and land possessor have several other business concern as an alternative.

Table 4. **Annual Cycle of Sowing and Harvesting**

Season	**Crops**	**Sowing**	**Harvesting**
Kharif	Rice	*Sawan - Badra*	*Katak - Manghar*
	Mungi	*Jeth - Harh*	***S**awan - Badra*
	Jawar	*Jeth - Harh*	***S**awan - Badra*
	Bajra	*Jeth - Harh*	***S**awan - Badra*
	Till	*Harh - Sawan*	*Katak - Manghar*
Rabi	Wheat	*Manghar - Poh*	*Vesakh - Jeth*
	Sarson	*Assu - Katak*	*Chtar - Vesakh*
	Sugar-cane	*Manghar-Poh*	*Manghar-Poh*

There is no canal in the village, so water is not available for irrigation. Wooden tools are used for farming with the help of cattle and camels, and some conventional methods are

used for agriculture. But recently, the landlord has brought the tractor over. The owner of the tractor farms on his own land, while others pay.

For better production, *desi* and fertilizer are used. The entire village has fertile land, but due to the riverbed soil, the land near the Indus River is more fertile, and the yield per acre is also higher than another land. Two crops were sown. One is called *Kharif*, which is a summer crop, and the other is called *Rabi*, which is sown in winter. In *Rabi's* wheat, *sarson*, *moths* and until or sown *Kharif* crops, such as rice, *masur*, sugar-cane and cotton, etc.

When the crop is ready for harvesting it is used reaped through the collective effort of the number of persons of the village. Sometimes a *wangar* is called for this purpose. After harvesting, it is gather to the place for threshing. Both type of threshing, modern as well as traditional is available in the village. After the threshing the grain stored in Pallas but now in stored and use throughout the years. If there is need of grains at the end of the year then people borrow it from each other rather than buying. To trade, they use homemade metrics and modern metrics, such as *topa* (equal to two kilograms of wheat), which is a conventional metric. The top quarter is called *propi*. Fifty tops are equal to one kilogram equals one hundred kilograms of Pori. But now people completely use modern measurement methods. For example, *kandas*, and electronic scales.

The dairy farming is not only a belonging but their usage is many folds. They are utilized in cultivation labour, loading and giving the milk. Cow, oxen, buffaloes, goats, sheep, and horses are kept as a farm animal. Being the riverine area there are more buffaloes then cows. The green feed is really essential in the livestock who give milk.

Figure 6. Showing different crops

2.22. The Conventional to Modern Irrigation System

The supplying of water system plays an essential function in farming. The canal scheme of Pakistan is reasoned fit in the global but unluckily in this village, there is no channel of water. The farmers have to face many troubles to water their crops, particularly in the summer season. Since 2018 a transformation occurred in an irrigation system that is people installed solar panels for irrigation purpose and as well domestic use. Initially, its cost is high but after installation, its cost is zero even no maintenance cost. Farmers called it the solar revolution in the agriculture sector. This is environment friendly and zero-emission. A revolution that takes centuries from well to solar panels.

Figure 7. Solar powered tube wells

3. THE FISHING COMMUNITY'S PERCEPTION AND PRACTICES OF CLIMATIC CHANGES

Specific purpose for the chapter about the consequences in changes in climate through community actions, observations, in-depth interviews, focus group discussions and case studies. In this chapter, I conducted a detailed study of the data collected on-site and get feedback and triangulation through FGDs, key informant interviews, case studies and detailed informal conversation and formal interviews with native people. This section is organized by the important title of the questioner to collect data and information from indigenous communities.

This looks that the fishers explain the word climate change, in accordance with the special environmental conditions and circumstances they usually look a domain wherever their livelihoods concerned. For instance, mostly responses in disaster especially flooded area understand climate change as meaning floods of dense floods During the in-depth interviews about the key persons explained and explicitly expressed that changes in climate mean year-round changes. About some other aforesaid that climate change means increasing in temperature.

3.1. The Riverine Area of the Indus River

The Leiah or Layyah district is comprises of three tehsil namely, Layyah, Karor Lal Eason and Choubara. Tehsil Chobara is deserted tehsil where only gram crop is grow because this crop is drought-tolerant. Geographically Layyah district is located in disaster prone area e.g. flood, river erosion and drought. Its western or riverine areas affected by flood and river erosion and its eastern side affected by drought. Climatic point of view the district has its own importance. The village for this research study was selected Shinah Walla. The village lies in union council Basera.

The union council Basera is the lowest area in the region, located along the Indus River. The fishermen's community in Shinah Walla village, which the locals call Kehal, the fishermen have historically engaged in some subsistence fishing activities, but they no longer do it. The Indus River Delta and fishing areas have become highly unpredictable,

sometimes flooded, and sometimes the water volume decreases. The main source of livelihood is fishing, followed by raising livestock as an adaptive strategy.

The main sources of drinking water are river water and groundwater and get drinking water acquired through water pumps, though the taste and quality of water are gradually declining. A regional government does not provide sanitation facilities in the region. The fishing community must travel to Kaoror City to enter the Tehsil Headquarters Hospital. The infrastructure in the area is poor-some areas have been electrified, but the villages where the research is conducted do not have sufficient electricity, roads and schools.

3.2. Intensity of the Change in Climate, Endangered the Fishing Community

About all the answering said that they had determined climate change in the past five to ten and twenty to thirty years. About intensiveness and severity, the people of fishing community members consider that the effect was great bargaining. This understanding and perception were powerful in flood-prone fields. The people from flooded areas reasoned the effect of climate change as a single medium or small in the areas where they live.

Compared with the respondents who are not sensitive to bread and butter, the conceptualization and perception of the impact of climate change among the interviewees they employ in the fragile life of weather and climate. For example, the income sources of respondents in fishing communities are immediately affected by climate change, which suggests that the consequences may be high in their location. They have also participated in the same confirmation of life incapable of climate change. Report and notice and observe various perceptual deviations. The female participants who signed contracts with the male participants believed that the impact and consequences of climate change have changed dramatically in the local area

The community experience a big transition of change in the weather e.g. improper, inadequate, unpredictable, delayed and heavy downfall and temperature increases over the last fifteen to thirty years. A clear fluctuation was obvious in various regions. For example, casual, inadequate and massive precipitation was mentioned the fishing people in flood spheres. Entire the public of the fishing community noticed and observed enhanced

frequency and property of flood. Fishing communities have experienced several harmful consequences in climate change. It is often proved that the impact is taking into account the fate of fishing fish, crop failure, and other welfare hazards that increase nutritious food and risks and dangers.

3. 3. The Activities undertaken in the area of livelihood

The activities undertaken in the study area related to bread and butter got to be climate highly sensitive; fishing and farming, animal and child-rearing. The findings found that of the fishing people are doing fishing, keeping animals, poultry and daily wage labourer in agriculture field. The practices one or more than one sustenance activity such as fishing, farming, animal and poultry rearing and daily laborers.

This applies to the following situations: In a country, due to appropriate action plans and indigenous strategies to overcome the future consequences of indigenous level changes in climate, the effect of climatic change is insufficient, and the lives of the community are likely to be harmed. And in the world. The diversity of livelihoods can enhance the level of community response, which can reduce the extreme insecurity caused by climate change.

3.4. The Livelihood Activities and Climate

The results and findings of the study demonstrate that the people of the community are displayed to various effects of changes in climate on fishing people day to day earning and livelihoods. The fishers retell that, the noticeable and feel changes in weather and in climate in the research area are floods, riverbank erosion, thunderstorm and salinity. One of the respondents said; –Currently, the downfall is no longer certain and foreseeable; increasing period of time have varied and this state affects our fishing commodity to the full degree and hence, it leads to food danger to most of the households in the area. I anticipate the status of food security to be intense upcoming if the observed variations in climate will continue existing".

The investigation results as well as findings apply that sustenance activities of the local community will go on experiencing the effects of climatic changes and hence, also attempt of reduction of economic condition in the fishing community will be a peril to a large level.

This calls for group action climate change issues into the policy talks for developing proper execution that could benefit to cut down the degree of being exposed shocks, trends and risks attributed to climate change effects.

3.5. Indigenous coping mechanisms and adaptive strategies to climate impacts

There is short and long term carrying out that an individual, a fisher or the fishing community acquires so as to hold in the observed impacts of climate change in direction to secure a living. This is owing to the fact that, besides the observed impacts of climate change, still human endurance is desperate.

The fishing community people has formulated some mechanisms - coping strategies enhanced resilience regarding combating the impacts of climatic changes in research village. I got the response and they argued that in the situation of food inadequacy because of climate change impacts, they usually control themselves to decreasing the amount of food per day, consume wild fruits and wild animals respectively. The situation shows that, climate change is a actuality for the the fishing people even so some of the coping and indigenous strategies developed. The fishers are still climate sensitive that can go on experiencing climate change impacts. The fishers could be left to the higher level of existence open to the hazards attributed to climate change.

3.6. The Indigenous Mitigation Strategies

Controlling impacts of climatic changes in the upcoming of necessity to have appropriate indigenous extenuation strategies so to control the effects and impacts. Nevertheless, the indigenous reduction strategies vary from one area to the other location. Depending on the social-economic characteristics of the native communities trying to articulated and address the anticipated coming effects and consequences changes in weather and climate.

The fishing people also executing indigenous actions to minimize the effects of change in weather and climate. Fishers argued that, they have started afforestation rather than deforestation at a small scale around their huts and the field that is barren and where water is accessible and also avoid burning the plants and trees in autumn season. They consider

aforementioned native strategies as a coping and mitigation strategy because of the the fact that woody plants react just like carbon sink.

3.7. The Climatic Effects and Impacts on Family Unit

Nearly 90% of the research results indicate that fishermen‘s families are affected by the climate. Water erosion, floods in the area have hardly changed. The fishermen who were hit mainly pointed out the failure of fishing production. The failure of houses, gardens, trees, the loss of livestock, the loss of livelihoods and the danger of happiness. In 2010, we suffered severe floods. The flood damaged the animals and the harvest. The 46-year-old fisherman said: "Our fish is declining every day."

We have to move from one place to another for instance, currently, we are here but hereafter we do not know where we will be and other fishers. Abida mai, age 27, lives in the village Shinah Walla, on the left bank of the Indus River. She respondents that she has no land and no fishing boat except a few fishing tools. Her husband is a day laborer and catch fish with others fishers. They lost their fishing boats and equipment in the catastrophic flood of 2010 and lost their houses due to river erosion in 2019. They have moved many times and now they are likely to be homeless. Now they live on loans from contractors.

She also said: "We only eat food when my husband can make money from fishing. During the flood, my family faced challenges and faced great difficulties because there was no fishing job and daily salary. , That is the building at that time. The husband must be restricted at home. Due to the scarcity of bread and butter, we live." She added that we don‘t know if we can stay here for a long time. The erosion of the Indus River may make us go further at any time. We live here today, but we don‘t know where we will be tomorrow.

In the focus group discussion (FGDs), most of the participants mentioned the decrease of fisheries and farming products because of climatic changes. Mostly are directly or indirectly hit by changes in climate. Usually, due to current conditions, it is difficult for fishers to overcome asset losses. Fishing communities accept, changes in climate shall be a long-term effects on their lives as well as roadblocks in their efforts to escape poverty. I

asked about the possibility of their social units being affected by climate change, and the interviewees admitted that their families are indeed vulnerable.

3.8. Climatic Changes and Peoples' Perception

The understanding of the causes of climate change. The research of the entire fishing community is familiar with the term –climate change". But the fishermen basically do not know the cause. Interviewees believe that all these changes come from Allah and are the result of our bad behavior. In in-depth interviews, people mentioned man-made (human activities) as the cause and cause of climate change. Some people believe that carbon dioxide emissions come from different sources such as automobiles, industries, brick kilns, diesel engines and motorcycles.

Human factors (human activities) are also mentioned, which exacerbate the impact of climate change. Many FGD (focus group discussion) participants identified and observed that the area has been affected by more floods and river erosion in the past few decades. Participants in the focus group discussion were questioned if they believed that someone was responsible for climate change at that location. The interviewee expressed affirmation.

The participants who asked for an answer "Is anyone responding to climate change" was asked about their views regarding responsibilities for responding to changes in the weather and climate at the research village. Almost 85% of these participants said they were "naturally" responsible. Women insist on this view more than men. Some respondents said that the government and the rich should be responsible for climate change.

3.9. Validation of community perception and experience

Obviously, because climate change supports the views and observations of fishermen, the conditions of weather and climate-related changes have improved. It has been known that temperature rise leads to climate change. Therefore, it has been proved that soil disasters such as floods and riverbank erosion have occurred frequently in the study area in the past ten years.

On the other hand, some people think it is not. However, some fishermen do not know, nor do they know whether the difficulties can be solved. Women tend to be more confident in the prospects for solving problems. Male respondents mentioned that they did not know whether the problem could be solved.

3.10. Floods

Over the years, floods have submerged the plains along the Indus River in the region. Community members say that the continuous overflow has made the soil in the village arable and productive. Due to the expansion of the Indus River, the cause is the result of flooding. However, in the low-lying area at the foot of the summit of Koha-i-Sulaman, western mountain floods caused flooding, silting up silt, which was mainly sand. The sand hardens when it scorches, so farmers are required to cultivate more extensively, and farming tools are not always available. Allah Ditta, 57, said that we wanted to plant another crop in the summer, but it was impossible to plant it due to the annual floods.

The fishing community did not notice a significant change in the flooding rate: the study area and Layyah area have been flooded for more than 25 years. The government has built flood dikes to prevent floodwater from flowing into crop areas. In addition, the community has developed its own response mechanism to deal with these disruptive events. Every year, every farmer builds a small embankment around the fields.

Over the years, they have modified them after negotiating with each other, thereby increasing their height. These barriers can protect crops from flood damage. To protect their rations and other valuables from harm, the community built a high soil platform and moved the rations there during the flood. Fishing communities and farmers temporarily moved more of their families and livestock to higher locations where flood water cannot reach. Once the water receded, they returned to their homes. 60-year-old Ghulam Rasool said that when the flood came, we moved to a higher place and stored grain on the upper part of the farm or landlord‘s farm. After the water receded, we returned home.

3.11. The Increasing Summer and Decreasing Winter Temperature

The community has felt and noticed this in the past one to two decades. The temperature in these areas has been rising, so it can be felt that the overall temperature is rising throughout the year. The community has noticed that in winter, indigenous people do not wear shawls or jackets. In summer, the heat increases. Facts have proved that in winter communities, a small amount of fuelwood is needed for heating purposes (although it has not been significantly reduced, because it was previously unknown that the winter in Layyah is an extreme summer.

During the summer monsoon season, the community noticed a slight drop in the weather. Due to late sowing and early harvest, rising temperatures shortened the growing season of crops by more than fourteen days. Fifty five-year-old Mithal Kehal said: ~~–~~Seven or eight years ago, we had six months of winter and six months of summer. Now, summer lasts 9 months, winter lasts 3 months or even just forty days. Haji Kihal said that summer is much warmer than before, and winter is colder than before.

3.12. The Unpredictable and Delaying Rainfall Patterns

The rainfall pattern becomes very unstable. People feel that they cannot predict rainfall as before. Heavy rainfall events outside of the monsoon season: This is a strong isolated event that may damage crop growth.

3.13. Climatic Impacts on Fish, Wildlife, Animals and Trees

Fishermen reported that until 25 years ago, migrant birds such as herons, pigeons and *murghbee* were often looked in the delta. But now, their number is significantly reduced. Quail, part and wild pigeon species found locally are rare. The community believes that this change is due to warming weather and flooding. It was found that the population of this area has increased and the hunting pressure is increasing. Common wild animals in the area include wild boars, snakes and jack wolves. The number of these animals has

decreased significantly. According to Ghulam Akbar, we used to have birds like herons and Siberian pigeons in winter.

The abundant use of pesticides is the major cause of reduction in birds. Butterflies still appear from February to March. There may be obvious changes, such as wheat sowing, but since the emergence of butterflies is not directly related to economic benefits or lower benefits, the community cannot respond very clearly to changes in time. The only change they pointed out was the large number.

The fishing communities studied are the main source of income for many generations. Although the main pillar of the earning is catching fish,about two and half decade before, the fishing people made a limited number of baskets to supplement their fishing income-especially during the spawning season-and the district authorities ordered a ban on catching fish. Nevertheless, already mentioned, due to the degradation of agricultural land, the community can no longer continue to use the basket.

Fish production has dropped from eighty kg per person per day fifteen years ago 4 to 5 kg per person per day. Fishing income fell sharply, and communities were unexpected to for time being move to fish places in the west of Shinah Walla to engage in agricultural work.

Due to reduced income and substance for households, people are unwillingly to catch fish in banned season. They do not sell this catch due to lack of its production. In the past, native people practised replenishing baskets, providing grains, also compensating for low income during the off-season.

The *dumbera* prices are now high 20 years before. The *dumbera* fish had been decreasing day by day. In the past, the locale where the Indus river water was mixed was easy to reach, and there were a lot of them, and they were used as fishing grounds. Since the 2010 flood, followed by river erosion and flooding, these areas have been separated by large areas of river water, forcing the river water to enter the delta and sink into inland depressions.

In the past, the fishing industry could reach these areas by land. Now they need powerful motorboats that can sail into deeper waters and enter the breeding grounds of dumbera fish.

However, this type of ship is very expensive and most people cannot afford it. River erosion and flooding have increased poverty, fishing communities have been restricted, but fishing has eroded out of the river.

Ghafoor Kehal is 44 years old, native of Shinah Walla. A professional fisherman, passed down from generation to generation. People call him "*manchra*" to refer to those fishermen who catch shallow-water fish with nets on their shoulders. These fishermen are the most marginalized.

Looking back twenty years ago, we caught more fish. In that era, fresh water was abundant. There is greening of crops everywhere, and the rest of the family members engage in activities other than fishing, such as for family consumption. Agriculture, raising livestock, migrating birds, using weeds to make mats and other household items. Except for 1999 and 2003, there was no heavy rain. Dunmbara returned to deep water and bushes, where the water level was low and very thin. The farm is very rich. Now I am not sure how to survive and feed my child. There are no important small businesses in the villages studied. The whole community is engaged in fishing activities.

3.14. The Climatic Evidences

Although fishermen and farmers in flood-prone areas have formulated local response strategies/mechanisms and adapted to the daily changes brought about by floods every year, they are still marginalized. Flooding occurs every summer during the monsoon season, which prevents them from growing any cash crops during the *rabi* (winter) season. As a result, they grow wheat in the *kharif* (summer) season and have no choice but to grow fodder and vegetables in the *rab*i season.

Major harvest cultivated on the floodplain is grain, that grows during the winter months. Part of the western region, community tried to grow cotton during the rabies season, but due to flash floods that destroyed the crops, it was unable to cultivate their land to prepare for rabies cotton. The community reported that wheat production has increased in the past 30 years: before, they had only fifteen to twenty mounds per acre (1 mount equals 40 kg), but now most fields have doubled their yields. Fans are more. The range is between 34 and 44 *maunds* from eight canals.

Nonetheless, the effect is not due to good or bad weather conditions, but to a large extent due to developed seed choice and quality, more accessible and low-cost fertilizers, motorized farming, and low-budget chemical substance. Although these causes together can increase wheat production, the cost of farming land and growing harvest has accumulated. In terms of income generation, 34-44 *maunds* per acre is still low.

In same agro-ecological zone, the typical yield of irrigated wheat is about to 55 maunds/acre. However, the flourishing period of time has shortened. The sowing time of the crops is fifteen to twenty days later than before, and the harvest is earlier-this is the effect of rising temperature. According to Fatima Bibi, 45, our cotton crop is only 1.25 feet high this year and is often affected by diseases.

3.15. The Climatic Evidences

To supplement fishing communities with low fishing capacity, a large number of supplementary livestock management will usually be implemented. This is no longer the case. Twenty-five years past, there was a pasture where you could graze livestock and go home by yourself. No management is required. In the next thirteen years, these reductions in grazing area were mainly due to population pressure and increased arable land.

Thirty years ago, farm animals were using small pastures but needed to graze. At present, almost all the land is cultivated, and there is no open space behind for grazing. Livestock needs to be fed with fodder, and the rabies season after wheat is planted needs to be fed with fodder. Due to the annual flooding, too much forage cannot be planted because it takes at least one month to re-use the pasture. The reduction in feed consumption has an adverse impact on the health of livestock, the quality of dairy farm outcomes, and the prices of products and animals in the market.

Our livestock get sick often. Even if they are fed the same amount of feed, we will spend money to cure them like before same. It is said that 48-year-old Muhammad Ashraf. In two and three decades before I have five to seven animals. We just let them eat grass in the open air. Now I have two and three animals. The animals have no grass because they don't have enough feed. Nasim Bibi, 61 years old.

There are no permanent immigrants in the area. The fishing community moved out temporarily when the flood occurred, left the grain and all items at home on the elevated platform, and returned when the flood subsided. Due to climate change, community members have to somehow migrate to other areas to do work, sometimes with their families, sometimes their families stay in the village. When the fishing season began, they returned to their village.

Figure 8. The Indus River is eroding houses and fertile land. A person is demolishing his house. An elderly man with his family take shelter in tent. The affected community is praying for end of river bank erosion.

3.16. Women

Women in these river regions must now work harder to achieve their balance of payments. With the drastic decline in drinking water quality, women now have to fetch water from farther places. Women usually have to walk six to twelve kilometres, which makes them spend an average of four hours to fetch water, so they have little free time to engage in other income-generating activities such as needles, embroidery and kitchen gardening.

Nowadays, the amount of fish caught has been greatly reduced, and communities continue to adopt complementary wire basket production methods. Women have to wash and dry some of the fish caught in order to store them to meet family needs. This also took up a lot of their time.

Another reason women are cited for their reduced activity in this area is that there is no commodity market for them to engage in manual work. The prices for their work are not commensurate with the women‘s efforts in preparing these items.

3. 17. Unsustainable indigenous coping strategies

- The entire community agrees that fifteen to twenty five years ago, after managing the catch, finding drinking water, cooking food, caring for the home, and caring for children, women still had time for needlework and baskets.
- This is no longer the case, and they are deprived of other sources of income that they can use when needed.

- On the other hand, the government has not launched a special social safety net program because the fishing community is completely dependent on natural resources.

- Due to lack of fish, fishermen increase their fishing time: this increases the cost, which is an unsustainable practice.

3.18. Conventional coping mechanisms

The study area is an area prone to flooding for many years, sometimes causing floods in this area. As a result, communities, especially those engaged in basket farming, have designed anticipation performance like this cases. Few conventional methods utilized to foretell the upcoming heavy rains and heavy rainfall in the river are when small bubbles appear in the river water, and the river water becomes cold. The appearance of a small snake called a lazy man heralds flooding. The community will rely on these indicators and will not always show it, making the community ineffective to foretell and ready for alteration in atmospheric condition.

3.19. Cultures (indigenous adaptation strategies) and fishing practices

Most of the households were poor and ultra-poor. About all the capable male including boys above 10 years were engaged in fish catching occupation in rivers. The female members were engaged in different domestic tasks with preparing nets and decorating varied materials while the male went for fish catching.

The children essentially assist their parents or sisters and brothers in the boat for catching fish when the children become aged between seven and nine years old. Consequently, most of the children were not acquiring the chance to have a formal education. The early union was seen among the girls, so they also become deprived of formal education. The man-made and natural disasters and fishing livelihoods choice was also the hindrance of taking education for them. It was hard for them to be participating in other professions because of their lack of education.

People have seen them observe several cultural customs in the mosques of the village, such as regular prayer, marriage, sehra bandi. People in the community usually receive treatment from a local doctor or Hakeen. In a few cases, they tried to go to Karor Lal Eason Tehsil Headquarters Hospital for better treatment. They have also received treatment from other places, and the fish they went to was far away from their respective residential areas.

Fishing personnel usually need some necessary requirements, such as food, medicine, life jackets, support personnel, enough mosquito nets, vaccines, information about disasters, enough oil, fishing tools, manual or in some special cases by the engine operation Large boats and water purification tablets. These requirements are essential for the smooth and easy fishing of fish. But in many cases, most fishers cannot afford all these necessary equipment. It is determined that most fishermen cannot afford life jackets, vaccines and medicines. They face many problems, such as lack of education, a crisis of safe drinking water and improved sanitation facilities, insufficient embankments and flooding, and lack of funds for fish fishing.

Excessive presence of middleman, very few livelihoods options without fish catching and lack of enough skills for achieving alternative livelihoods. The socio-economic and financial causes and climate change were responsible for these problems. It was found that they used to catch from two for livelihoods purpose. Firstly; they used to catch fish in dhands or small water and close and open water bodies, and secondly; they used to catch fish in river water sometimes they go in the deep water.

When they catch fish in the small river, they can go home within the scheduled date. However, when they used to go too deep water areas frequently, they need to be prepared

and must bring other necessary equipment to stay and spend five to ten days of fishing trips. All fishing personnel are not able to fish in deep water, because they need strong boats, more manpower, enough oil and other equipment to go to these fishing grounds. Others usually fish in *vaheera*, manned and small waters and adjacent fishing grounds.

3.20. The Fishing community vulnerability and climate change

The vulnerability of the fishing community was assessed, and four hazards were identified. These hazards had already impacted and been frequently affecting their livelihoods. Sometimes, these hazards turned into disasters and make lot of losses of their livelihoods.

Table 5. **Frequent Hazards Ranking and affect the fishing community**

Sr.	Name of the hazard	Ranking	Affecting period
1	River erosion	First	June to September
2	Excessive hot weather	Second	April to September
3	Flood	Third	July to September
4	Salinity	Fourth	December to May

3.21. Hazards impacts' on the fishing community

- Destroy properties and livelihoods options.
- Make economic loss and create problems for getting safe water and having access to hygienic sanitation.
- Destroy housing infrastructure and roads.
- Increase displacement and force the fishing people to shift their properties.
- Spread several types of diseases.
- The river bank erosion badly affect the fishing community. It destroy their livelihood, infrastructure, boats and other fishing tools.

Figure 9. The community people are demolishing (*Shaheed*) mosque because of river bank erosion.

Climate change trapped in disasters. In recent years, due to climate change, people in fishing communities have had many observations and experiences. They shared that most of their families were hit by the 2010 –super flood". They were also affected by riverbank erosion after the 2010 flood and during the study period. They lost their homes, fishing boats, and tools, and their families fell into a helpless situation. In addition, they said that in recent years, disasters caused by climate change have occurred frequently in the study area. High wind speeds will bring severe thunderstorms, which will lead to greater losses. During the flood, the residents of the community suffered from a shortage of drinking water. They found that fresh drinks are not easily contaminated by floods.

Each flood inundated the low-lying areas of the study area. Their fishing boats and tool areas were damaged by the 2010 "super flood". Many people have lost their homes, and temporary fish workers have suffered more losses than others. On the other hand, household income sources/occupations in the study area are affected by climate-induced events/disasters. It can be clearly seen that flooding and riverbank erosion have severely affected the source of family income/occupation.

Though the community area is treated as the lush green area due to its riverine nature in past years the impacts of natural and human-induced climate change had been visible. Though in the previous time, the climate of the community was mainly moderate. But in the last 30 years, the climatic variation has been acute as massive changes have occurred in

the seasons around the year. Heavy rainfall in the short span of time has been visible in the last few years and the river erosion has increased. It was found that climate change had many impacts on the livelihoods of the fishing community:

- Climate change had impacts on the natural, financial, physical, social and human capital of the fishing community.
- Fishing had been a vulnerable profession for them.
- A climate change has impacts on habitat quality and migration routes of fishes and destroys the breeding sites.
- It was found that 20 kinds of fishes were less available. This occurred because of the destruction of fishing grounds and rise of temperature derived from climate change.
- The expenditures of living and fishing mechanisms have been found at an increasing ratio where their savings identified at a low.
- Boys between ages eight to ten years must assist their fathers/brothers for fish catching. So, they were losing their childhood and opportunity for education.

3.22. Adaptation to climate change

It was found that three kinds of adaptation measurements were helping the fishing people adapt to with effects and impacts of changes in climate.

- Institutional adaptation approaches undertaken by government.
- Adaptation initiatives undertaken non-government and community-based organizations.

3.23. Indigenous/conventional adaptation practices

The fishing community of the area has developed their own adaptation strategy in the last few decades by using their indigenous knowledge. Though they don‘t know the meaning of adaptation, they can distinguish the way to fight with the natural disasters and calamities. Adaption meaning for this fishing community means the way of surviving. These adaptation practices include:

- Designing disaster-resilient houses to reduce disaster impacts.

- The erosion problem cab be handle with tree plantation.
- The valuable things can preserve by dumping.
- The production of vegetables and animal rearing as indigenous and alternative source of livelihood.
- Borrowing money from neighbors or middleman.

3.24. Adaptation initiatives undertaken by Government

- One tent, non-food items, one bag of flour, cots and water purifiers tablets.
- A local activist and fisher man Ghaffor Bhutto played role on risks reduction activities like helping in shifting the vulnerable people to at safer and secure places especially for women and young girls. Provided those blankets, medicine and safe water during disaster period.
- District government and local non-government organizations provides advices the fishing community regarding different issues.

3.25. Indigenous adaptation initiatives undertaken non-government and community-based organizations

- Some non-government organizations worked to reduce disasters risks and promoted fisheries.
- Some community-based organizations helped to equip the fishing community boats with lifesaving kits, a radio (for listening flood warning, thunder, storm) and re-excavated ponds which remained also as reservoir of sweet water and the fishing community‘s people used the water for drinking.

3.26. Changing livelihoods

Now the fishing community has to think about alternative livelihoods as the fish catching has become vulnerable in recent years. It was found that they had apathy to alter their traditional fish catching practices, but they were bound to migrate to near city or town for better livelihoods options. The production of vegetables and animal rearing as indigenous and alternative source of livelihood. The women are working as day laborers in the nearest

community. Some has changed their profession as a mason, a laborer in agriculture and brick fields also. Some young are going to Karor Lal Eason city for getting better occupation such as working at shops, riding rickshaws and vans. Some of them have the plan to go to Multan and Rawalpindi for new searching. According to key informants, about 10% of the people have migrated to towns or cities for seeking alternative livelihoods in the last 9 years after 2010 flood started the migration to cities.

3.27. Case Study: No.01

Name **Nasro Mai**

Age **60 year**

Caste **Kihal**

Economy **Fishing**

Marital Status **Married**

Type of Family **Joint**

Children **4 sons and one daughter**

Religion **Islam**

Education **illiterate**

3.27.1. Introduction

Nasro Mai is a 60 years old fisher lady, belonging to Kihal clan of the area. Nasro Mai has four sons and a daughter, she is an illiterate lady living in a joint family. She started fishing activities and field work right after her marriage when she was quite young. Nasro is a hardworking experienced fishing lady and has a good deal of influence on her family regarding important decision making. She is concerned about the changing weather conditions though she does not have knowledge about climate change concept and its possible impacts on human lives.

3.27.2. Personal and Financial

I live in a joint family with my husband, daughter, sons and their families. I have four sons with her along with their families and one son has separate family setup. I am elder female member of family and I support the daughters-in-law for looking after the livestock. I cut the fodder for livestock, milk the cows and clean the cattle place twice a day. Me and my husband hold the family. I take the decision and mostly my decisions are accepted. My husband involves me in important family decisions, my husband is not a rigid person and he accepts my decisions, my sons also obey my decisions. I am important to my family as I handle the family setup and support my family in daily routine chores.

I am involved in production of different fishing process and crops like wheat, paddy fields, *mungi* and till. My husband is a simple person and my support is very important for him so right after my marriage I got involved in fishing activities. It is my own decision and it was also need of time to work with husband. It is useful for my family as it is a livelihood source and extra quantity of fishing produce is sell in the local market. I work for five hour a day. I go to the river early in the morning and by walk. Then I feed the livestock, clean cattle place and look after my grandchildren. I work in my own fields so there is no wage for personal work.

Me and my family sell the fish in the local market so get reasonable amount from the fish. It differs from 32,000 to 42,000 for different type of fish. I have the hold of money so money is used to bear the expenditure of family such as food, clothing, schooling etc. It is joint money and I keep money with me as I am elder family member. I use money for my family. Being the responsible person of my family I have to do saving for my family so that it is used for them in any difficult situation. I save money personally and do not have any bank account. I am not earning directly but money gives power to individual and enhance the respect among family members.

3.27.3. Climate Change

I am an illiterate woman, so is my family, I do not know much about climate change yet I can say for sure that weather conditions were not the same 20-30 years back. Weather is getting hotter and sometimes unbearably especially for an old person like me. Rains have

increased unpredictably, this year rains are continuously going on.In my opinion increase in the level of hotness in summer is climate change as it effects the human lives. I do not have any idea. For me change in weather is climate change. Weather is different as compared to past, I mean when I was young. It may be climate change or I am unable to bear it due to age factor. It is changing as summers are getting hotter and long. It starts from April and ends after October as in past October used to be cold but now it is different.

Working in field is becoming difficult, after doing one household chore. I become tired and I have to rest for sometimes. It was not the same in past, lives were easy at that time. Unpredictable rains have become common, last year fish production totally destroyed and fishers bore heavy losses. It effected our lives as in summer now we have to complete the field work early hours and rush to homes. While in past cutting, threshing of wheat was done manually and we used to spend the whole day in field. Now we use machines like tractors, threshers and other agricultural machines.

This is an riverine area all our livelihood rely on natural resources like fishing, livestock rearing, basket making and agriculture. Because of changing climate our fishing and crops especially wheat production is changing yet not so as it causes delay of fifteen to thirty days. Yes it effects as last year our wheat crop was destroyed due to heavy rains. we faced heavy losses. Though we have not observed it deeply, however in summer due to heat animals take less quantity of fodder, secondly due to rains fodder gets affected.

Women are engaged in the household, fishing, agriculture and livestock activities and they think that performance of their work has effected due to hot weather. While young girls prefer to involve at household work instead of fishing and agricultural activities. Climate change has effects on every human being but rich people do not feel it as we poor people those are expose to weather directly. There is different understanding for both group as old woman are more involved in the fishing and agriculture activities and young girls are responsible for household chore along with their younger brothers or sisters rearing.

No big change has occurred in our life style due to climate change however with the passage of times life is changing. In past we used to lives simple life and same is the case now. Overall many changes have occurred, house are changed from hut to mud. People use curry instead of dairy products and cotton cloths are wore in summer and warm in winter

as in past there was no such difference. All are affected I think. Use of bore water and solar pump are new phenomena as rain pattern has changed in the area.

Clothing pattern has changed to reduce the weather effects. Women now cook the food in early in the morning in summer to avoid the heat as mostly we have open kitchen. No people are not moving to other places as they have their fishing activities and other livelihood resources and living here for years. It is not easy for them to go in city and afford the rented houses, moreover there is no such severe kind of effect that people have to shift.

In this village people are linked with fishing, agriculture and livestock and there is no trend of working as housemaid. Women work in field in every weather. It affects the skins of women as if I compare myself with the woman that is not working is field has good skin but weather affected me a lot. She said *"kam krna ha ju b mossam ho, ju zimidari ha wo tu puri krni ha".* Children are also affected by the increase in temperature, especially those who accompany mothers in field, especially small kids as they fall sick some get heat stroke and dehydration. Now we avoid children from taking them to fields and leave them at home with other family member.

It affected the manual work badly as temperatures have soared it becomes very hard working in fields similarly people involved in construction cannot work properly. Now people are slowly adjusting their work timing according to the temperatures. They now work early in the morning and in evening. Due to hotter weather land gets dried and needs more water for irrigation, this dryness has also reduced fertility as now inorganic fertilizers are used to increase the production and in past only organic fertilizer is used. For water requirement people have to arrange pump water for fields.

Such coping mechanism is used however try to cover the head in cold and hot weather nothing more than that. Workload remains the same throughout the year, only fishing activities keep on changing from season to season. Though we have to work throughout the year, yet winter season is ideal for working in open fields. Saving is essential for family wellbeing regardless of seasons. I have no information in this regards about any government action taken against climate change.

Government should subsidize the fishing and tools to help poor fishers in reducing their burden. Women should be trained about sustainable and climate resilient fishing practices and some soft loan for selected women groups should be introduced for the time when there is off season of fish catch.

3.28. Case Study No: 02

Name **Nooran Bibi**

Age **57 year**

Caste **Kihal**

Economy **Fishing and Agriculture**

Marital Status **Married**

Type of Family **Nuclear**

Children **2 sons and 2 daughter**

Religion **Islam**

Education **No**

3.28.1. Introduction

Nooran Bibi is a 57 years, old lady. She is married with four children including two sons and two daughters. She lives in a nuclear family setup. Her husband works as a fisher. Nooran bibi has a very good understanding with her husband both take decisions in consultation. She manages her finances personally as her husband lives on fishing trips and returned at home after fifteen days. Nooran bibi does not have too much knowledge about climate change. Yet she can identify changes occurring to weather patterns that is change in severity of rains, heat and cold. She has observes that with the passage of time life style is also changing.

3.28.2. Personal and Financial

I live in a nuclear family. My husband work as fisher on the Indus River. I am responsible for household management and taking care of children. I hold the family as my husband is out of home on fishing trips usually. I and my husband take mutual decisions. My husband involves me in decision making and takes my opinion. He went to catching fish with our mutual decision. I am important to my family as I take care of my children and household. Without me my family is helpless. I am involve in production fish, different crops including wheat and *munji* (paddy field). As my husband is out of the home so I have to take care of livestock. Adopting fishing occupation is our (me and my husband) mutual decision, moreover in our setup without woman‘s support it is not easy for men to handle the fishing activities alone. It is useful as from fishing and agriculture we get wheat for whole year and essential food items from fish that is sold in the market. However last year fish production damaged due to unpredictable rain and hail storms.

I work for four to eight hours in a day. I go to fields early in the morning and by walk. I cook food, clean the house and teach the children about fishing nets how they prepared. Sometime go to see neighbors and relatives. There is no set wage as we work in our occupation. Always, the situation is unpredictable, in the past almost 23 years back earn good. But now a days hardly buy food and medicines. There is no earning in the fishing and as well as agriculture. We work as as labourer, however by selling fish we earn 20-25 thousand rupees every season including agriculture acclivities. The money is used for my family expenditure. I keep money with me as husband is not always at the home. I use money for my family. I save money from fishing income and from the money given to me by husband.

Money changes the status of a person whether earned or taken from husband. I manage and handle the money personally that is why other family women take me as role model. I never had to spend my savings for family use as I mostly have enough money with me to fulfil my needs.

3.28.3. Climate Change

For me climate change is new concept but in simple word I can say that sun is hotter as compared to past. Last year rain in winter were more than previous years. In this year weather was moderate till start of month of May but in past usually weather got warm from

month of March. Children usually are waiting for summer vacations to come quickly as due to heat it becomes difficult for them to go school. Sometime summer vacation are extended due to hot weather. I remember that some years ago there was so much cold in winter that winter vacation were extended for two week in the month of January. I think change in weather is climate change, as we experience sewer heat and cold. I cannot explain about this as do not have much knowledge regarding this.

It is happening as I gave school vacation extension example. Fishing trips and crops patterns in the village have changed as people are now shifting to vegetable crops and adopting the tube well and pump. It is changing as summers are getting hotter and long. It start from April and ends after October as in past October used to be cold but now it is different. From changing weather I get idea of climate change, because of changing weather life is also changing slowly, now one cannot survive without electricity and electric appliances. This has affected, we prefer to stay at home in the peak hours of sunshine and go out either in early morning or in evening. It has damaged crop of wheat that never happened in past. It effects as happened last year due to damages of fish.

I have no livestock so do not have any idea about the effect of the climate change on animals. For young girls it is difficult to bear the severity of weather and they prefer to stay at home but older women can work in tough circumstances. In my opinion for rich, weather is the same as they have lots of facilities at home and they do not work in fields. On the other hand, poor class women work in field and at household level. So the rich women cannot feel it as compare to fishing ladies. With the passage of time, life style is changing and needs are also changing, as now more severe weathers are being observed.

Houses have changed from huts to mud. Food pattern of people have changed, clothes have changed, now people wear clothes according to seasons, and weather. All are affected but women are more as they have to work at household level and in the field with their men. Use of water pumps and drip irrigation has been introduced in many areas as rain pattern has changed. Clothing pattern has changed to reduce the weather effects. Life style, working and rest hours have been changed especially cooking and other household chores.

I do not think so, our area already have very less job opportunities. Life needs have increased now which need finances, previously life was too simple. It effects the health of

women as less use of water in summer cause kidney issue in women. I do not think so. Yes it has become hard to work manually in fields for example previously we used to clean fields from weeds manually now we use herbicides.

I do not have much knowledge about it yet it is evident that due to less rains and sometimes unexpected heavy rains effect yield. In summer we drink Lassi (a curd drink has a cooling effect) and in winter take tea after coming from fields to get fresh. Work load remains the same as it is our routine though crops keep on changing. In summer it is very hard to work in the fields or catch fish especially at noon, while in winter sun shine gives you relief from cold, I would say it is winter.

I save money throughout the year. I have no information what government taken any steps regarding climate change. Government should reduce wood rates, fishing tools, fertilizers, petrol and seeds prices. Government should introduce fishers trainings to women should also guide them about climate change what best practices we should opt, moreover give loans to women.

3.29. Case Study No: 3

Name	**Wazeran Mai**
Age	**66 year**
Caste	**Kihal**
Economy	**Fishing**
Marital Status	**Married**
Type of Family	**Nuclear**
Children	**2 sons**
Religion	**Islam**
Education	**Illiterate**

3.29.1. Introduction

Wazeran Mai, is a 66 years old lady. She is married with two sons. She lives in a Nuclear family. Wazeran Mai is a hardworking lady. She thinks she is the most important part of family and influential too. Her husband relies on her for family decisions and her opinion is always important. Though she has less knowledge about climate change. Yet, she has observed that with the passage of time weather conditions are changing and affecting their lives directly. Their fishing trips and catch are being affected as last year their production destroyed due to unseasonal and prolonged rains.

3.29.2. Personal and Financial

I live in a nuclear family. My husband work as fisher and also two sons. Being only lady in the family, I have lots of domestic responsibilities, which include cooking food, cleaning house, washing clothes, looking after the animals and support husband in fishing activities. I also cut fodder for animals and clean cattle place. My husband hold the family however when he is on fishing trips then I had to holding the family. But now I have handed over all responsibilities to my husband. I take decision after the discussion and consultation with my husband and sons. My husband involves me in decision making. He is not rigid and conservative person.

I am important for my family as without the woman especially as wife/mother family is incomplete. Every woman is important part of her family. I am working in fishing and agriculture activities before my marriage. My work for family is useful in a sense that wheat and pluses are used as food. I do not get money for these fishing activities. I work six to twelve hours per day in the time of fishing season.

I visit the fields early in the morning and by walk as fields are not far from our houses. If I have to go to distant fields, I mostly go on donkey cart. Sometimes my son drops me there on motor bike. I cook food, clean the house. Feed the cattle. My husband has no own land.

We have to work in the field of landlord‘s field. Through the fishing and agricultural labourers contribute to family income.

I do not have personal money however my husband give me money. I use money for my family that is given by my husband. In my family my husband is responsible for saving. My husband has bank account and he keeps the money there and I keep my saving personally. I do not have bank account. Some year ago my husband needed money for agriculture input and there was shortage of money with him so I gave him my saved money otherwise we had to take loan from someone.

3.29.3. Climate Change

We in family mostly discuss that weather has changed. When I ask my son to go to field he is always reluctant just because of hot weather, his father always gives him his own example that in his age he used to spend whole day in fields. My son always has a point that weather has gone hotter since then. We observe that summers have prolonged beyond September and even start earlier.

For me increase in temperatures and unusual rains are climate change. I think now the summer is very hot as we do not have any interest in plantation, in old days people used to plant a lot of trees and thought it to be their duty as trees cool the environment. We are moving away from nature. It is happening as previously we could stay without fan in villages but now use of fan is must that run by solar panels. Children and old people are main target of severe weather conditions whether summer or winter. Time span of summer and winter has changed and become sever. Summer is hotter and winter is colder. It is very rare to observe the spring now. Suddenly winter is converted into summer.

As I told weather has changed and has become harsh. It has become impossible to live without fans and cold drinking water which was not part of life a few years back. This has affected, we prefer to stay at home in the peak hours of sunshine and go out either in early morning or in evening. It has damaged and effected fish production and crop of wheat, onion that was not faced in past. I do not work as labour but change in rain pattern affected overall yield and income. Yes weather affects the livestock. Now people purchased the

new breed of livestock for better production. Sometime livestock become sick due to weather changes such as severe winter causes fever in animals.

Young girls prefer to stay at home that was not practice in past. Now they only deal at household level and still complain about the weather especially in summer. I think understanding of weather is same as weather is the same for rich and poor the only thing different is that poor lack facilities which rich enjoy. They have money they can fight the harsh weather. The life style is changing with the passage of time, as facilities are increasing that were never part of life, people now have many means to keep themselves cool in summer and warm in winter. Yes all have changed but that is not just linked to climate change with the passage of time things are improving, people have variety of food, and a vast choices in clothing.

Women are beast of burden in this area that is why they are more affected as they work at home, work in fields, take care of family. Fish catching and agricultural patterns have changed, pumping water with the power of solar energy has been introduced. Life style has changed better houses have been built, even sheds have been constructed for cattle.

Due to harsh weather people have adjusted their lives accordingly making changes in their working hours, in their food and clothing. No people are not moving to other areas due to harsh weather, as things have not gone so worse to leave the area. Women do not work as domestic labourer in this village. Climatic changes, affects our health, working in heat sometimes causes dehydration. So they do not suffer due to my engagement in fishing and agriculture activities. Also the climate change affected the manual work that is why now more machines are being used.

Because of unpredicted rains, flooding and sometimes drought affect production of fish. Sometimes completely destroy crops completely as is happening with our grams crop for last few years. Tractors, threshers, spray, fertilizer and pesticides have been introduced instead of old farming practices. In summer spicy food is avoided and yogurt becomes major food item for those who have livestock.

Our work load remains the same throughout the year as our routine remains the same. In winter we enjoy sunshine in the field as it gives soothing effect. In summer it is difficult to

work in field. I save money throughout the year as my husband and son give me money on monthly basis. I have no information in this regards. Government should train the women and men for catching fish. Women should be trained for indoor activities such as tailoring, dying the clothe ets so that they work within their houses.

4. CLIMATE CHANGE IMPACTS ON CULTURAL VALUES AND GENDER

People are also increasingly considering adjustments and adaptations, especially in the climate change literature, in order to provide feasible adaptation methods that may change the catchers to protect lives and interests.

One of the fundamental tasks that societies must address is some kind of adjustment to the hazardous features of the environment to which they are exposed. Human adaptations to environmental change are largely social organizational and technological. For human beings, decision-making and implementation are central features of adaptation‘ (Bunnett 1996). Human beings act with and adjust to some a sociocultural situation and environment as well as natural surroundings.

Eco-feminists, such as Carolyn Merchant (1980) argue that ―women are closer to nature than men, while men are closer to culture” (Carolyn, 1980, p.5).

Human adaptation is constituted in the form of beliefs, behaviors or technologies, which have become part of culture, enabling people to survive and reproduce in their entire environment. In fact, adaptation is part of the way of life. A method that is culturally recognized and promulgated in society.

There is an important difference between response and adaptation. Coping behaviour involves immediate problem solving and decision making. It involves improvisation. On the other hand, adaptation is part of common sense and practice found in culture. In fact, it is part of the overall "toolkit" of life in a specific environment.

There may be major differences between short-term coping survival and long-term adaptation processes. Adaptation measures to systemic hazards or risk characteristics that have formulated complete the period of time can adoptive and incorporated into the all-purpose funds of cognitive content, information, knowledge and practices, which are more or less effective. Generally, most hazards are systemic elements of a particular environment. If the hazard causes severe losses and damage to the community, does this

constitute an adaptive failure? There is a key problem with the concept of adaptation in disaster and climate change research.

The concept of adaptation may constitute the social vulnerability seen in a disaster and the damage and loss caused by it. It is usually a symptom of the conditions under which society adapts to various adaptation behaviors in its social, economic, transformed and built environment. In fact, a society‘s lack of adaptability becomes its adaptability failure. However, in the process of equating social fragility with adaptive failure, are the root causes and concepts of power lost? Adaptive failure will lose some system characteristics of a particular vulnerability. In other words, the social vulnerability of certain groups is part of the structure, not the result of their failure to adapt.

In climate change, are we talking about disasters? In some cases, perhaps in many cases, climate change will be accompanied by local vulnerability patterns of real disasters, including both sudden onsets (flash floods, thunderstorms, catastrophic floods in 2010) and slow-onset disaster processes, such as desertification or riverbank erosion.

Nevertheless, fishers people in the locale have financial loss because of changes in climate. The indigenous adjustment and adaptive strategies and steps were confiscated the community members. Numerous indigenous individuals from the locale interpreted that they did not receive any support from the authorities to address the effects of climatic.

No significant differences were found in adaptation strategies between fishing communities. Respondents who responded to steps to adapt to climate change said that their adaptation strategies are the foundation for improving their homes. This is the most widely reported strategy in all areas. Different plan of actions and strategies adoptive include temporary migration, tree planting, and plans to build homes on high platforms.

The respondents who did not take any measures to adapt to climate change were further asked why they did not take action. For most of these interviewees, the main reason is not knowing what to do. Respondents also said that even if people know what to do, they don't have the money, supplying and technology to implement the knowledge. Although people know what to do, poverty often hinders disaster preparedness. Based on their opinions, people will prepare according to their financial situation and the availability of materials. A

fisherman said: _we can only store food for one or two days; we have no financial ability to store more days. "

People seek support from competent authorities and tend to implement lessons learned from different sources. Many interviewees believed that they planted trees to protect them from natural disasters. A fisherman boy said: _I heard that there are more trees, which will help regular rainfall. This is why we should plant more and more trees. People are asked what it takes to alleviate the problems they faced during the last natural disaster.

The vast majority of respondents mentioned direct cash transfers, such as Watan Card. Other needs mentioned include training, contact information, technology and information. Male respondents place more emphasis on training, technology and direct cash transfers than women. On the other hand, women emphasize food, housing facilities and job creation.

Various disaster preparedness measures have been discovered from flue gas desulfurization. Sometimes people rely on God's mercy, and they believe that God has mercy for disasters. Those people think that there is no way to prevent natural disasters. In addition, interviewees said that sometimes disasters strike quickly and people have no chance to prepare. A 27-year-old Muhammad Rafiq said: What should we do, we are just to save lives, what else? We cannot take measures to minimize flash floods. We cannot afford any disaster preparedness measures because we have not recovered from the last disaster.

4.1. Experience of temporary migration

Some people mentioned various forms of migration as a means of adapting to climate change. Respondents in flooded areas reported that all family members were moving. As any interviewee whose family members have experienced immigration, in most cases, immigration is temporary or seasonal. Interviewees believe that more and more people have emigrated in recent years. However, when interviewees were asked about their possibility of permanent immigration, the answer was that it was impossible. Respondents stated that they are considering permanent migration, while some respondents are not sure

about this. Among the interviewees in the flood-hit areas, most people are not sure whether they have moved permanently.

From a gender perspective, men are contrary to women and believe that the possibility of permanent migration is very small. The uncertainty of the possibility of permanent migration of women is higher than that of male respondents.

4.2. A Shift of livelihoods because of climate change

Ask the respondents whether they have considered changing their livelihoods due to climate change. Almost some interviewees have never considered changing their livelihoods. On the other hand, due to climate change, respondents have changed their livelihoods.

Overall, the interviewees said they understand the government's plan-billions of trees to tackle climate change. However, there are gender differences in this awareness. In interviews with FGD and major information providers, it was observed that major information providers knew that there was a national plan (billion trees) regarding to address the issue of changes in climate.

Most of the interviewees who said they were aware of the government's climate change plan mentioned the "Watan Card" plan, such as billion trees and direct cash transfers. In addition, the government is making plans, formulating policies or conducting research on climate change. Some interviewees also learned that Pakistan is negotiating at the international level.

Learn more about whether they have abundant changes in climate or catastrophe administration plans in their area and whether they participate in survey subjects of the nature of the plan. Respondents participating in any of these programs stated that attending a meeting means attending a meeting. .

When asked about any interventions to address climate change issues in the region, especially concerns about women and girls, only a few people mentioned the existence of such interventions. Some interviewees in flooded areas mentioned this. Respondents who

knew of any specific interventions for women and/or girls said that women and girls only participated as beneficiaries, while women and girls only participated in training courses.

The fishermen were aware of any climate change or disaster management plans in their area, but did not participate or effectively participated in their plans, and were asked where they needed to increase their participation. Approximately half of the respondents believe that valuing their opinions will increase their participation. Interviewees mentioned that providing information in advance will increase participation.

The climate change plan mentioned by key insiders mainly involves fisheries, agriculture, infrastructure development and disaster management. Other plans cited include water, tree planting, education and cash transfer plans. Vital information providers have adopted new technologies to adapt to climate change in their regions. Key information providers believe that the technology currently in use is insufficient.

On the other hand, many examples show that if women participate in climate change activities, preparation and decision-making, they will bring valuable information and knowledge, experience and status, and can play a vital leadership role. Climate change reveals that the environment is changing at an unprecedented speed due to human intervention. These changes have had a major impact on human livelihoods and lives. There is an urgent need to understand and learn from these changes and their impact from a gender perspective.

4.3. The Role of women and climate change

Particular importance on female functions and roles in the fishing, water administration, land use, and energy planning. It is woman various productive roles. In the family and at the community level that is impacted harmfully by climatic changes. Floods, droughts, cold and heat waves, higher average temperatures and the riverbank erosion. In most cases resources get inadequate, production goes down, and prices go up conflicts regarding resources increases.

In the past few years and now, fishermen have faced challenges. All this has seriously affected women‘s shoulders and endangered human safety. A female fisher used these

words to explain her story. I have seven children. The 2010 flood destroyed our only room and washed away our fishing tools, animals, fodder and crops. As a result, we did not hunt and harvest. Hunger glared at us.

Women face special obstacles when facing disasters. For example, illegal behaviour and lower levels of education and training will reduce their ability to obtain basic information before, during and after a disaster. When the poor (many of them are women) die, they are more likely to fall into poverty. Because climate change has nothing to do with gender, gender-specific human security impacts have been observed in many places with severe climate change.

Women, like men, have formulated various response plans. According to the 72-year-old fisherman Allah Dewayya, "response" is not always sustainable, nor is it the best way to solve complex problems, but just a short-term survival strategy. Since there is usually no choice. The adoptive and coping measures such as adjusting diet, extending working hours, switching to other fuels, working under unsafe conditions and even forced migration are all coping strategies that fishermen can take.

Fishing community female is primarily, as victims of climate change, with a male as a player. Nevertheless, there are cases in which oftentimes women can be optimistic representative of change. Because of their work on the ground and dependency on natural resources. The various women have knowledge of native conditions and changes. There are examples from which it becomes obvious that fisher women have been very proactive for moving and placing the native to move at safer places.

The fishing community focuses on the main areas of human work, such as obtaining food and considering collecting materials. Safety of life, property and area. Collect water, energy, and feed; and fertility and support. Basic sanitary standards of care and collection of medicinal plants. In most of these undertaking, women play a prevailing role and in playing these they interact directly with the natural environment. Important categories are production, reproduction and distribution of resources and rights. The indigenous especially fishing women as providers of primary _environmental care‘.

In fact, "gatherers" are the main source of the family's continuous food supply, not just "hunters." Women‘s daily activities include collecting fruits, nuts, edible leaves, flowers, mushrooms, roots, fuelwood and medicinal plants. Meat is not a daily supplement.” The women who participated in the FGD (focus group discussion) expressed their ideas to record the plant information and knowledge they collected. One of the women named Sakeena said: I hope my daughter can see how much knowledge does her illiterate mother actually possess.

An attempt by a fishing woman to engage in animal breeding in the area is as follows: The woman harvests crops and grazes livestock. She transported leaf fodder and bedding materials long distances on difficult land. She watched the cattle on the remote pasture, took the animals to the water source, took care of the calves, milked the animals and cleaned the animal shed. In particular, collecting grass leaves, herbs and grasses is almost entirely the task of women, assisted by children (usually girls). Men‘s responsibilities are mainly in fishing, buying and selling livestock.

Fishing women are the main producers of food for their families. They work longer hours and earn less than men. In the studied area, the average working time of fishermen is 16 hours during the fishing and production seasons. In this fishing community, the division of labour is very strong, followed by women, while men play a key role. Although fishing is mainly a male occupation, which puts them in unsafe conditions at sea or in other waters, women occasionally go out fishing. They are more often engaged in the preservation and sale of fish.

According to Bakhat Mai, 62 years old, says, most of the time, fishing activities in the fishing community finished by women. Their income derivable from fish contractor and seller is in reality frequently higher. The income of their husbands and sons from fish acquiring. Fisher women are principally accountable for the set up of the fishing trip including the mending and boat building, while men often do the actual fishing. Water and fuel transportation, essential for fish scorched, are also primarily carried out by women.

Fishing for women is not only a task such as providing health services and sanitation measures but also related aspects such as providing household energy and water are also

the main responsibility of women. In this community, women and girls are usually the exclusive suppliers of household water. They collect water for cooking, bathing, cleaning, maintaining health and hygiene.

Male family members seldom provide help for frequently used family water transportation tasks. They only do this if they have a bicycle, motorcycle or trolley. Through work, women have gained expertise in local water management and use. They mainly share this knowledge with their daughters and with each other. Since they perform other tasks such as washing clothes, washing dishes, cleaning toilets and maintaining personal hygiene, in some areas, women have established specific methods to reuse waste to save supplies.

Owing to conterminously river bank erosion, women have played an significant function alongside men in the building and administration of housing and construction.

Changes in climate are not only striking female but also men are forced to accommodate. Owing to the river bank erosion one and only plan of action adapted is temporary migration or settle from one place to another in the same village. A fish woman expresses her thoughts in these words I do not have wish to quit this locale but there is nothing even river snatch the earth under the feet, where do I go with my children‘. I love this place‘.

4.4. Coping adaptive strategies

The community of fishing has coping strategies to deal with the troubles and problems attached to climate change. Most of these strategies are on the native environmental and sociocultural context. And not all of these are sustainable themselves. Whatsoever of the coping plan of actions native women and men utilize are. Most of the time, endeavour and strength are places into the work, especially by the fishing women. Nevertheless, some are limitations too much period of time and endeavour someone individual can pass, peculiarly for happening this and finished a long time period.

Special human actions purpose at devising accessible more earthy origins and sources and accelerating their supplying. The Illustrations are women‘s openings in plantation of trees and re-afforestation, also forest preservation and betterment human actions. The kitchen

gardening, installing of water points and regeneration of degraded land and watersheds, all through the active engagement and involvement of women.

Fishermen retain the use of natural resources. For example, a common plan of action is to switch to another nutritional product that requires less cooking time (these products are usually less nutritious). They limit the boiling of cooked nutrients or water, and all their health conditions are worrying. Other prospects are the use of energy-saving or resource-saving equipment. Noteworthy examples are that when these applications and technologies exist, women are not fully consulted as users in their planning and implementation.

Some other issue, which has been interpreted by any women is employ and usage. In determine of water insufficiency, for instance, they come through to reprocess and use water for various intentions and purposes.

Indigenous people are also considering using alternative energy sources such as solar energy for cooking. Switch to unconventional crops or dynamic planting structures or applications and technologies. When the land asset base becomes too controlled to survive, an overall plan of action is to find alternative means of income generation.

Women are particularly organized. It has not been used for collective use in the field or earthwork resources. They share the difficulties they face and seek solutions. Groups may be formed, or existing women‘s organizations may address environmental issues in their income and livelihoods.

Fishing women and men organized to protest against riverbank erosion. Not only did they record the protests on the banks of the river, but they also recorded them in there and the regional press clubs. Endanger the improvement of their natural resources livelihoods. In addition to demonstrations and movements to maintain resistance. They often use non-violent opposition and block ways to stoppage these human actions.

An era when fishing communities lost their property and livelihoods. They have fallen into poverty, and they have experienced differentiation and marginalization from the increase.

As poor families, many of them are headed by women. Often live in an unstable environment. In lowlands, unsafe riversides. They are in a state of losing their houses and their economic security is adversely affected. Has a major impact on indigenous women and men and their children.

Insufficiency of natural resources, the causes of overflow, erosion and unforeseen precipitation have particularly caused women to engage in activities that are difficult to guarantee soil quality and livelihoods. In this situation, female and girls have no time to receive education, make money or participate in local government elections.

The indigenous fishing female and male are beginning to coping with a dynamic climate. The commencement to eloquent their precedence and needs for securing and prolong their earning and livelihoods. There can be leading deviation between coping with the present conditions. Making the best of it with the controlled origins accessible.

Often a more sustainable form that assists to safeguard and retrieve a livelihood in a change or changing the local context. The indigenous coping strategies are not often sustainable or healthy. For instance, skipping meals, using low energy roots or money lending. The native coping and indigenous adaptation strategies in which women are involved. Aim to beef up the direct safety of their household and gathering.

The current research study shows that the fishing community coping and adaptation strategies in which women play a crucial role, include:

- Move to an elevated platform, build a temporary shelter, improve the platform level of the house, and carry out temporary relocation.
- Save assets: store seeds and move livestock and fishing tools to higher places.
- Adapt to agricultural practices: switch to flood-resistant crops and varieties; multiple planting practices.
- Unconventional supplying of water installation may change production make easy salable harvest mixture another goat-raising and poultry farming.
- Energy-saving: Use energy-related alternative technologies, such as solar energy, biogas, improved cooking utensils, etc.

- Dietary adaptability: skip meals or eat non-traditional foods or preserve foods used during periods of infertility.
- Make money or save money: work as a wage-constrained worker; often borrow currency from shopkeepers at high-interest rates; secretly save the income; endanger the livestock business, and fall into prostitution under severe distress.
- Alternative health care: use and promote traditional medicine and medical practice. Organization and collective action:
- Establish indigenous groups base and networks, and group monetary fund or group labour systems.

In the utmost climatical cases such as floods and the riverbank erosion, women have list down their precedence at the time of climatic hazards.

- Security: Provide a secure location for the family and for their bread and butter, including relocating at safer places, structure of camping and adapting by building strong houses; safely storing their harvests, seeds, livestock, fishing tools, utensils, stoves, Firewood and basket.

Food security: Support adaptation to fisheries and hunting, farming patterns, considering crop diversification.

- Information: information should be accessible for women.
- Service: Visit the health service doctor and Patwari.
- Enhance capacity: develop their capacity via preparation and data, considering via contacts and exchanges on adjustment plan of actions and livelihood options.
- Resources: Approach to sources, regarding environmental funds, increases access to credit and markets.
- Environmental safety: ecological restoration.

4.5. The Individual Level Strategies and Climatic Changes

During the research period, four widely used action plans or strategies were studied, such as skill acquisition, career change, financial management, and innovation.

4.5.1. The Skills Acquisition

A wealth of evidence from many fishing communities in the Indus River shows that in a given season, some men are more successful than competitors using the same equipment or equipment. A fisherman said: "One person can catch up to two or four others." Fisher believes that many factors affect success. For example, he considers fishing trips in terms of the number of days or hours of fishing, the characteristics of fishing, and the relationship between fishing success and personal psychological characteristics. Another fisherman said, ―Young, healthy, serious, willing to take care of dangers, also the quality to lead the commitment of the people" is essential to successful fishing.

The achievement of the fishing boat is closely related to the degree of psychological matching between the partner (supervisor) and its team members, which influences the formulation of fishing strategies. In addition, "a lot of technology, climate and personal characteristics will affect" the emphasis. I have observed and noticed the importance of skills during fieldwork, so it is difficult to obtain information about the nature of these skills because fishermen will "treat these frequently received information as scarce capital." Before and during the field survey, "It is widely known that anglers are reluctant to share information about their skills.

An old fisherman says, ‗disregard the efforts of getting fishing ability, there is a consensus and steady notion which show that in various fishing persons ‗the types of abilities and skills essential for achievement are very so much the same'. It is obvious that a fisher essential know how to direct and keep his boat and tools. As an anthropologist, I focus on the types of skills that keep a lot of time and the attention of experienced fishermen. The focus of the search method is the fish to be caught. There are four types of abilities and skills.

The basic principle of being able to find fish concentration is to know where these concentrations are suitable and to be able to search for those hot spots. Fishermen must be able to sail with high precision. Before the arrival of the complex diesel engines and electronic battery gears commonly used by Sindhi fishing persons in the area, this was usually a challenging art. In some communities, various blind calculation systems are used, depending on the detailed knowledge of the stars and the characteristics of the river and sky. Anglers can not only perform dead reckoning but also determine their position by knowing in detail the seabed they are travelling on.

The fisherman has sufficient knowledge of the river itself, the level of the river, the current, the bank, and the type of bottom and intensity. This type of information and knowledge is very important, especially when people want to deal with harmful or misplaced fishing boats.

The fishers had a in-depth information and knowledge about the fish they are searching for and looking for. Although fishermen usually know a lot about the behaviour of the animals they see, they don't seem to classify fish very finely.

The fishermen must know what other fishermen know and their behavior. In general, the catch depends not only on the positioning of the fish, but also on the pursuit of them by various other fishermen. Such type of information and knowledge is nearly affiliated to data management and regulation confining competition.

4.5.2. Switching from fishing to other occupations

The most popular local climate change strategy that fishermen use to adapt to uncertainty is to incorporate occupations. Since the super-flood switching and common occupations occurred in 2010, fishing has rarely been dedicated. It is almost combined with hunting, agriculture or other occupations. In today's fishing communities, fishermen usually perform multiple jobs, rotating between fishing and non-fishing jobs, or switching between different fishing during the course of the year.

However, in many economically mixed fishing communities, the cultural and emotional significance of fishing far exceeds that of agriculture. A fisherwoman said: "The emotional qualities of land and boat people are different." She further emphasized, _no one dies from digging potatoes. There is no danger in growing wheat, rice and barley.

The conclusion is that fishermen combine fishing and non-fishing work during difficult economic times. Although the changes in the fishing industry in annual rotations are a well-known phenomenon, little is known about them. It shows that the annual changes in fisheries are related to the career cycle of fishermen and the desire to permanently transform from one major fishery to another.

In the long run, the success of fishing is not only related to fishing capacity, but also to the ability to process and invest the funds generated. For fishermen, financial management is very important. I also observed and noticed in the in-depth interviews that the FGD between men and women clearly shared that ―we (the fishing community) cannot save money, but they accept that this is essential for long-term success and in the event of disasters such as the flood in 2010. After the flood and flood erosion experienced a shortage of funds.

One of the main ways that fishing communities compete with other communities is to adopt new and more effective fishing gear and boats. However, it has been observed that fishermen are unexpectedly conservative. If there are more documents documenting cases where innovation is rejected rather than accepted, then fishermen will become conservative. A young fisherman said, _this is very common. If it is economically unprofitable or does not conform to the existing cultural model, then innovation will obviously be rejected. Some families in fishing communities refuse to use electric motors or new fishing gear because they threaten traditional lifestyles. Motorboats are used by local elites, but most ordinary fishermen who cannot raise the necessary capital do not.

In the past 35 years, research on innovation has focused on individual decisions to adopt or reject innovation. The fixed nature of the resource base hurdles the adoption of innovation. Only when more fish are available for fishing, technological innovation can increase fish production. The fishing industry in this area refuses to innovate mainly to prevent unemployment.

Many fishermen in the region not only influence the adoption of innovation. But are also interested in the impact of innovation. In some cases, this suggests that the introduction of innovative modern fishing fleets become the cause of inequality. They widely shared: ―We know that the use of diesel engine in fishing grounds will obviously lead towards the high and low class in the community. Most the important thing is that they know that technological change will bring about unemployment, ecological and climate damage, and even the most serious consequences.

Having dangers and unpredictable situations related to fishing acclivities. There are many pieces of evidence that showed the fishers commitment, seriousness and dedication with

their occupation. I observed them during fishing trips and found that the fishing persons were generally positive about their business. The reality is that people like their work and see it as an adventure. In addition, they said that they like fishing because of their independence, difficult tasks and lack of teamwork in the outdoors. Because _it‘s both attractive and pleasant, it brings in considerable income and allows people to operate independently.

At the time of fishing trips, the fishers are psychologically ready to adapt different kind of situations like thunder, erosion and flooding. They have to prepare mentally for any risk and have capabilities and strategies to address the situation. Their income is not so high but they try to update their fishing boats and other tools.

The psychological characteristics of fishermen pretend that there are major cross-cultural differences. There is sufficient evidence to show that in many cases, fishermen are combative, brave and independent. This may have to be anticipated in hazardous work because the decision must be made in person. Most fishermen think "their ancestors are legendary heroes", but now we don't like them because of processed food. Their personal characteristics and culture indicate the independence of fishermen. The fishing community of the Indus River highly rely on each other regarding fishing activities and minimizing risks. The people in the fishing community believe that because of the nature and independence of their jobs, they are superior to agricultural workers.

Based on gender roles and responsibilities, well-established departments have been established in the work of the fishing community. Men are fishing, while women work at home. Obviously, fishing activities require a lot of energy, and fishermen have this energy and quality. Both men and women are satisfied with their occupations, but due to the climate change in the Indus, they worry about their livelihoods and prefer to switch from fishing to other occupations. However, adopting other occupations requires them to acquire and learn skills, which is not easy.

In the peak fishing season, the distance between husband and wife is greater than the distance between each other. The couples have established different connections, loyalties and activities, and these two groups are mutually exclusive. The fisher prefered his boat and fishing trips, the boat become his second home village. At the time of the fishing

season, his contacts more develop with the boat mates like as important as his family. Same like husband fishing women establish her contact with her women relatives and both husband and wife reorient themselves on the returning of husband from a fishing trip.

Days when the hubby goes dwelling usually just looks the vacation. However, because such a husband and wife are really suitable for separation, if the husband stays at home for too long, it will produce a lot of pressure. The fact is that although the husband should have superior authority, the wife has to work harder to make the real decision about the family. The normal schedule is disrupted and life is busier. This fact exacerbates this pressure (Stress/tension). When he left, everything returned to normal. As far as the fisherman is concerned, he is often happy that he is back by the river.

4.6. Case Study No: 04

General Information

Name	**Nasra Mai**
Age	**45**
Caste	**Kihals**
Economy	**Fishing**
Marital Status	**Married**
Type of Family	**Nuclear**
Children	**02 (one son, 17 years old and one daughter 14 years old).**
Religion	**Islam**
Education	**Illiterate**

4.6.1. Observations before the start of interview

Nasra Mai, forty five years old, has one son, seventeen years old and one daughter, fourteen years old. She lives with her children and separated her husband a few years before due to family disputes. Now, she make *purha parree* (earn livelihood) working in the field of fishing. According to Nasra, _now life is difficult but there is peace of mind'. Weather is becoming hotter day by day. In this year, rain in *Badu* (August-September) except in Sawan (July-August).

4.6.2. Personal and Financial

I lived in a nuclear family where I and my son and daughter live together. The major responsibilities are cooking, washing clothes, dish washes, child and animals rearing. Regarding out of home I work in the field of wheat crop and fishing. I am the head of household after separation with my husband. As a head of household I am worried about my children livelihood. The boy went on work in the field of rice and also fishing trips. No, I am not living with my husband.

I feel I am the important part of my family. I am the mother and as well as father of my children. Without me they get worried. Since my childhood I am doing work fishing and after marriage that work continues till date. Working in the field of fishing was my own decision. My parents were poor and I want to help them. My mother was chronic patient of tuberculosis (TB) and unfortunately the money we earn spent on her medicines.I want to change my fate and my children circumstances – for their better living and for better education. Almost whole the day from morning to evening just break in lunch time.

I wake up at 06:00am and start my work. *Buzarges* say, _if you want to win your day, win your morning'. At 08:00am take *nerhann* (breakfast) and again start work. In previous years the rest time was 12:00pm to 03:00pm but in last two years that was 11:00 am to 03:00pm. In break time take some rest, look after the animals, children (when my children were feeding), and prepare and take tea. For harvesting wheat crop there is *theka* (verbal contract agreement) with landlord.

I earn almost Rs. 26,000 in a season of fishing including basket making and wheat harvesting. I spend money often on food items, clothes and medicines. I keep money myself. Most of the time for food item, a little bit especially for my daughter dowry now

she is growing day by day. If I work and earn money, anybody will respect and value me. The person who do not work he will be no respect and value in the family and as well as society. I buy small boat in Rs. 25,000 after saving money almost in seven years this year.

4.6.3. Climate Change

If summer season come then there is a noise about it and same thing for winter. This is all because of Allah Almighty. The intensity of summer in the month of *Harr* (June – July) and *Sawan* (July – August). I get the idea of climate change through feelings, body temperature and on crops I mean burn crop, become yellow and affected by disease. I perceived it since last decades. There is smog in the area. In smog there is no coldness it's just like dust in air or like a web net. Burning crops and landlords sow crops again and again. They complaint to seed dealer regarding seed quality but dealers say ‗this is because of extreme weather conditions'.

This year in winter there were more extreme weather of summer and I think it broke the previous ten years records. This summer also broke the record of previous years. For instance, rain in *Badu* and there were no rain in *Sawan*. For summer, ‗*Badru bad rang, kalay chittay hiko rang* (Badu is the month in which everyone facing its intensity because of sweeting). For winter, ‗*manh fojan charyan, poh larri Uo*' (In the month of *Manh* coldness start and in *poh* fog start – the peak of winter season). Through feelings I get the idea that there is something new that affecting me badly.

The changes in climate affecting me and also my work like in more cold and heat go out of the home is difficult. Even this year, a few landlords who plough for weeding rather than manually weeding in the field. In winter I can do work in the field and eradicate extra plants. Timely rain means crop will be sowed in time and also harvest. In case of less rain it means sowing and harvesting season delay approximately two weeks. If two or three times rain I am hopeful crop will be sowed in time otherwise not possible. In more intense climatic conditions work less and earn less. As a result, eat less and get weak day by day and adapt negative coping mechanism like skipping meal etc.

In case intense hot day and suffocated night animals have *honkerri* (breath problem) and may be get senseless and die. Get weak because in extreme heat eat less fodder, produce

less milk and meat.The changes in climate older women survive very difficult while young women have ability to cope with extreme climatic conditions. No, the rich have facilities to cope with changes in climate like air condition rooms, solar fans etc and in winter heated rooms and quality of food. On the other hand, what poor do, if they find or able to collect wood set on fire in winter and sit under tree in summer. People lifestyle is changing due to changes in climate like clothing, food and in drinks.

In summer eat vegetables, use *pakki lassi*, *kachi lassi*, milk, *shekanjbeen* etc. In winter, eat meat and eggs and as well as *daal channa* or its soup. In summer people prefer to wear light clothes and in winter dark and warm clothes. Men complaint about hot and cold weather condition _for ten and twelve years I am separate from my man and I do not care either he feel coldness or hot weather‘. Woman affected more than men because she works more than men like child rearing, animals rearing, cooking, washing clothes, dish washes and sweep courtyard. For woman it is too much difficult and challenging task when her baby is crying due to hot weather and she also affecting intensity of weather. In that situation she prefer first protect her baby than herself.

I observe and notice *jawar* and *bajara* both are burn due to extreme weather, animals get week and lees milk. Our strategies depend on our economic condition and availability of money. Most of the strategies are conventional like sit under tree, set on the fire in the room; use *shekanjbeen*, *pakki* and *kachi lassi* etc. I store wheat, onion, potato and wood for upcoming winter season. In usual routine my son and my daughter say that there is more extreme summer and move from here toward hilly area but on serious note never ever think about it. Climate change and pandemic girls are learning skills regarding tailoring, embroidery etc. Sitting in the room girls and women can do the work and protect themselves from the changes in climate.

It affect my work like I do not targeted work when I do not complete my targeted task then obviously, earn less. In normal routine they play out of the home and during play they do not feel either there is coldness or hotness of weather. But they get sick, weak, flu, fever etc. Day by day increasing weather affect the manual work. In that situation, I do not work. The fertility of land is decreasing because of changing in weather and climatic conditions. The land is becoming *skrund* (hard) day by day.

I did not observe any new technology that anyone is using in the field of fishing and agriculture except solar panels. Use vegetables, drinks, lassi, milk, meat, *shekanjbeen*, warm and light clothes. I like winter season and prefer to do in the winter season. For me both seasons are equal. In winter I prefer to work because I work more and more. I save grain for winter so that in foggy days do not sleep with hungry belly. I save four bag of grain each bag is 100 kg. Red pepper, onion and wood save for this purpose. No, I do not have information about this but I do not see anybody from government who is panting tree in the village. just listen and watch on TV about tree plantation.

4.7. Case Study No: 05

General Information

Name **Akhtar Bibi**

Age **48**

Caste **Kihals**

Economy **Fishing**

Marital Status **Married**

Type of Family **Nuclear**

Children **04 (03 son, 24, 26 and 28 years old and one daughter, 20 years old)**

Religion **Islam**

Education **No formal education**

5.7.1 Introduction

Akhtar Bibi, 48 years old, have three sons and a daughter. Her husband died before five years ago and she take the responsibility of her family. She says, ‗for poor both summer and winter season are not favourable, they have to work either hot day or cold day for bread and butter‘.

5.7.2. Personal and Financial

I live in a nuclear family with my three sons and one daughter. Two sons are married and daughter marries two days before, Allahumdulilha (thanks God). Only one son is unmarried soon he will be married. My husband died five years before. At the home my main responsibilities are look after my sons‘ children and also see some financial matters like how many rupees earn and where they spent. Since the death of my husband I am the head of household. My sons and daughter give me what they earn from the field of fishing before and after their marriages. Now, my eldest son is the head of household on my behalf. I am able to take my decisions. I consult with my sons and daughter. Consultation is good thing to avoid conflict. my sons involve me in important decisions especially in financial matters and decision about marriages.

I am important part of my family as a mother and as a head of the household. I never feel that I am not the part of my family. I involve in the production of fish and fishing activities. The crop sow in *Assu – Kitak* (October – November) and harvest in *Chetr – Veskh* (March – April). This is my own decision to work in the field of fishing because there are no other work opportunities in the village. I can do only the work of fishing Before marriage work with parents and after marriage with husband.

„Karmazdoree kha churee"(work hard and eat with butter). *Mazdoree wich koi meinharra ni* (there is no stigma in hard work). At the peak season of fishing I have work 10 to 12 hours or sometime more. I get up early in the morning and come in the field at 06:30am and work till 12:00pm. I cone in the field by foot because usually my field is on walking distance. In the field the break time is 12:00pm to 02:30pm in summer season and in winter just eat lunch and take tea and then start the work. At evening come back at home and do the domestic works like animals rearing, cooking, washing clothes and dish washes. Our income is seasonal not a regular like a salary. I earn that mostly spend on food items. For instance, on this fishing season I and my three sons, their wives and my daughter work together and earn Rs.27,000. This summer season due to lack of rain less weed grow that‘s why earn less.

Almost every week essential commodities like ghee, sugar, onion, flour, salt etc finish and buy new. This routine continue whole the year. My husband died and I keep money myself

and give money to elder son because he is responsible of the household on my behalf. I often use my earning on food items, clothes, shoes, medicines, and marriage, birth and death ceremonies. But save a little due to hike in the prices. Daily the price of commodities increase like yesterday the price of one kg sugar was 95kg and the price of one kg flour was Rs. 60. I have no bank account. I keep money at my home. I have no saving just fulfil our daily expenses related to food, tea, clothes, medicines and ceremonies. I keep at home Rs. 500 to Rs. 1000 for *achan chaytee* (emergency) at home.

5.7.3. Climate Change

I did not experience such a hot summer in my life. There is more rain in *Sawan* (July – August) but this year rain in *Badu* (August – September). This is all from Allah and the result of our bad deeds. We were sitting and sudden rain but now a day that is not happening. My idea about climate change is that more and long summer season and short and extreme winter season. This year in winter fog continue more than one week. The process of climate change like clouds come and rain. This summer no clouds nor rain even no thunder storms. This is happening around us such as due to fog the fish catch affected to some extent. This year the extreme hot summer affected the jawar, bajara and guara crops. These crops affect at the first stage of growth, their leaves burn because of extremely hot days and no rain even due drops. The landlords and farmers sow in the month of *Sawan* the rain is expected but no rain. I have kitchen gardening at the home and I watering my vegetables almost two or three days interval but vegetables have no growth. The land becomes *skrund* (hard). The trees are not growing (*kumarrn*).

This year was too much hot than previous years like more suffocation and no air. More extreme winter and same extreme summer. Yes, the climate change is happening and I get it through feelings of body temperature, whole the day drink water and sweeting. It is affecting my work routine I am not able to work in the river. I have difficulties regarding changes in climate and also the age factor. Now, the wheat crop sows two weeks due to lack of rain and as a result harvest two week late. Due to lack of rain wheat crop affected by diseases and ultimately it badly damage the crop yield.

If I do less work then obviously get less money. At the time of fishing season more extreme weather. In case extreme weather spends more days so that work can finish. It is

impossible work in the foggy days. According to Akhtar bibi, ‗for poor this year was difficult due to extreme weather and pandemic'. For the rich and government job holders both winter and summer are easy for poor both seasons are difficult.

The climate is affecting animals without proper shower buffaloes, cows, goats and sheep do not survive. I remember in my life never give shower to goats but this summer that is happening. Due to hot weather condition animals eat less fodder as a result get weak, less production of milk and meat. This year I see people are using solar ceiling fans for animals so that their animals protect from the intensity of warm weather. I remember people use tree shadows for animals but today cow and buffalo do not sit under tree. There are less grazing field due to lack of rain less grass grow.

Young girls cope with warm weather for old age women that are too much difficult to survive in scorching heat of Sawan. For old age women and men winter is also difficult get fever and flow.

Both seasons are for the rich people like they use air conditions, solar fans, air condition vehicles, *shekanjbeen*, *lassi*, milk shake, cotton clothes, eat meat and eggs and so on. For poor not summer and not winter they have to work in any season. According to Akhtar bibi, ‗for us in summer load shading, less electricity and more bills, I just have one pedestal fan and that use for five persons'.

The rich people have life (facilities) but not for poor. The poor have to go to the field, work there and when return at home most of the time no electricity, if it is then low voltage. In winter the rich people use heaters and the poor people use fire just a one hour but depend on the availability of wood. I have no fridge so that I have to buy *warf* (ice) in Rs. 30 to 50 per day. In winter, the poor only take tea and in summer drink water.

The lifestyle is changing day by day such as use drinks, lassi, milk, watermelon, juice, mango shakes, peach, meat and eggs but depend on *phareend* (economic condition). According to Akhtar bibi, ‗the poor (I) use *shekanjbeen*, *lassi*, milk and water melon one time in a week but the rich use daily. For me sugar and milk prices are high and I am not able to afford it. Even in Rs. 20 I bought two lemon and they were small in size and less water'.

In summer season regarding use of clothes, I use *tayra veera* (a local variety of cloth and they have lower prices than lawn and cotton) in summer. I buy *tayra veera* suit in Rs. 400 while the price of lawn and cotton per suit price is Rs. 1600 to 2100‘.

The women are more affected from climate change. The birth of girls are more than boys, I do not know it is natural or due to climate change. But in the fishing season both women and men affected equally from climate change. To bake bread on *tandoor* (oven) is difficult. The man just do one work out of the home while woman do multiple tasks at home such as child rearing, cooking, serve guests, washing clothes etc. The recent development are burning of *jawar* and *bajra* and trees are not growing and no rain in *Sawan* and rain in *Badu* this thing is surprising for me.

Use drinks; eat vegetables, water melon, meat, eggs, tea and so on. No, never just in chit chat my children talking about this that we should move from here to Murree because in our area winter and summer are extreme. The climate change and pandemic have taught us to enhance and learn the skills regarding indoor work like embroidery, tailoring and flower making from papers. It is affecting the pace and tempo of my work in the field. I use water again and again in the water. Due to pandemic people do not buy fish from us. The children get fever, flow, eye infections, and skin diseases and so on in both summer and winter. It affects the manual work. The people get tired soon and cannot work in extreme weather especially in summer. The land get weak and become *skrund* (hard). The grass like *jawar* and *bajar* burn and trees growth affected.

No, I do not see that anybody using new technologies except installing the solar panels for domestic and agriculture purpose. Drink water, *shekanjbeen*, cold drinks especially my grandsons, *lassi*, tea, meat, vegetables and so on. I do enough work in winter because in winter feel minimum tiredness. I like winter season because enter into the *razai* (quilt). In winter I can do more work with easy way.

About saving for the seasonal intensity Akhtar bibi says,‘*kamee aa tay kadhi aa* (earn and eat). I do not have information about the government that our local government is doing something for this purpose. Initiate the tree plantation in the riverine area so that women and men can earn better. Provide tool kits for working men and women so that they protect themselves from cold and hot weather. Train young girls for tailoring and provide sewing

machines. Train young girls regarding embroidery and provide embroidery machines. Establish training centre for women and girls so that they can earn their livelihood with respect and dignity sitting at home.

4.8. Case Study No: 06

Name **Tahira Bibi**

Age **36 year**

Caste **Kihals**

Economy **Fishing**

Marital Status **Married**

Type of Family **Nuclear**

Children **1 son and 1 daughter**

Religion **Islam**

Education **Primary**

4.8.1. Introduction

Tahira Bibi is a 36 years old lady, who has one son and a daughter lives in a nuclear family. She takes all decisions in consultation with her husband. She is important part of the family. She is working in fishing field before she even got married. Her husband is a fisher. She has to support her family so she works in the fields. According to her, temperatures in her area are increasing day by day. She says few years back whenever their was hot weather they used to give reference of Sibbi a Balochistan city famous for its hot weather. Now according to her temperature in her own are have go above 48-53 degree Celsius.

4.8.2. Personal and Financial

I live in nuclear family with my husband and kids. My husband is a fisher. I have the responsibilities for all chores of household, I do all work of my family as cooking, cleaning, washing and care of my family. My husband holds the family. I take decision after the discussion and consultation with my husband. My husband involves me in decision making yet he is the final authority as far as decision making is concerned. I am important for my family as without me my family is incomplete. I am working in fishing activities before my marriage. It is part of our life, there is no choice to leave it. To support family woman has to take part in fishing activities.

My work for family is useful as my husband is a daily wage labour and these fish fulfil our food needs. I work eight to twelve hours on daily basis in different seasons. I visit the field early in the morning and by walk as field are not far from my home. I cook food, give meal to my children, feed the cattle as I have only one cow. There is no set wage in this area as people work in their on behalf. I do not work as labour in fishing field so there is no earning. My husband gives me money to run the household expenditure. I do not have personal money however my husband gives me money.

I use money for my family that is given by my husband. I have to save money as my husband does not have regular work. I keep the saving personally. I do not directly earn any money however money matters a lot as far as status of any person is concerned whether man or woman. In recent COVID-19 situation when there was lock down and there was no work for daily wage labour at that time me and my family used the saved money for family expenditure. Due to COVID-19 people do not buy fish from us even our regular customer. The months January to March considered good for eating fish but now people avoid us.

4.8.3. Climate Change

My husband is a fisherman and he has to work in sunshine and rain to earn the money for his family. He is working for last twenty two years but now he says that weather has changed and it affects his performance. As per my understanding it is true that weather is changing for last few years. We have changed our life style, we have shifted to hut to mud houses. There is traffic and factories trees are reducing and weather is getting hotter. It is

happening as earlier we did not have electricity and still we were living a comfortable life but now for last 10 years we cannot even think about life without electricity.

In past we used to hear about Pakistan‘s hottest places like Sibi where temperatures remain very high but now we have 48 to 52 Celsius plus temperatures here in our own village. Winters have also become very harsh as temperature drops below 10 Centigrade. We have to keep the children warm to save them from seasonal diseases. I just get idea of climate change because of weather change. Temperatures have increased we got severe and prolonged summers, similarly sometimes winter are also prolonged and unseasonal rains this year we had rains which started from march and kept through May keeping temperatures low, and destroying our crops.

This has affected our lives and work. We prefer to stay at home in the peak hours of sunshine and go out either in early morning or in evening. It has started damaging our wheat crops. For some years, this year it was completely destroyed, we never experienced this in past. Farmers of this areas could not earn a single penny from wheat crop this year.

Weather affects the livestock. Due to change in weather sometime we face the shortage of fodder so one or two animals are kept at household as being a poor family we cannot afford to purchase fodder for livestock. In past there was less trend of girls education and from very young age families used to involve the girls in fishing activities but now situation has changed and community try to educate their girls. So young generation is less involved in fishing work. While woman (married/aged) have to take part in the fishing activities. Girls are not directly exposed to sunshine in summer so if they have to go in field they get irritated. In other case older women have to work in any situation. So older woman are more affected due to climate change. **“**today‘s general does not have tolerance”

Weather is same for all but facilities and life style decrease /minimize the effects on upper class. Aged people need special care, who cannot bear the harsh weather. In past community used to lead simple life and now they avail different facilities, there was no electricity but now each person use electronic appliances such as fan. In past have to fetch water from well but now every household has hand pump. Hut houses are replace with mud houses. People used clay pots now they have metal utensils. People use warm clothes during winter and wear light clothes during summer, but this is an old practice the only

thing is that people now have more resources to spend, we used to spend whole season in single suit. People did not eat as much as now do, meat has become an essential food item previously vegetables and dairy products lead the food choice.

All are affected but women are more as they have to work at household level and in farms. Women have more responsibilities as compared to men. Hand pump at household level and bore water is used for irrigation as now people have shifted from wheat to vegetable production. Clothing pattern has changed to reduce the weather effects. Women used to cook the food in early timing in summer to avoid the heat. Peak hour of summer are spent at home instead of fields. No people are not moving to other places, as there is no need to do so and living has not become that bad that somebody seriously think of leaving the area.

No we are not domestic labourers we work on our own. It affects the health of women they have to work in any weather but they try to work in the comfortable hours of day to save themselves from severity of weather in summer and winter. It affects the children as I have young children less than fifteen years so I am always worried while going to fishing. They will go out of home in my absence and may get sick especially in summer season while in normal days they go to mosque and school and I remain relaxed. Climate change, affected the manual work as my husband is fisher and people of community do not start work in rainy or hot weather and it ultimately affects his income.

In summer use dairy product such as lassi and in winter use to take tea after coming from field so that get fresh. Workload never decreases it remains the same regardless of season. Winter it is easy to go in field because of weather but farmer community mostly work throughout the season in the field. I save money throughout the year as we depends on fishing and daily wage labour so to manage the household needs, saving is important for us. I have no information in this regards that government is doing about climate change. Women should be trained for indoor activities such as tailoring, sticking and dying the clothes, which would make them independent and would support them in running their house.

5. SUMMARY AND CONCLUSION

One of the biggest concern of the planet earth is climate change. It is happening around us not only in Pakistan but also worldwide. Its effects and impacts are undeniable. It causes social, environment, political and economic problems. It effects by solar output, volcanic eruption and the planet earth‘s position around the Sun. This current decade was the hottest decade on record. The climate change becomes the cause and generates other issues mainly conflict over natural resources particularly water. The major climatic events observed in last decade like a super flood, 2010, Karachi heatwave, 2015, in December 2019 smog observed in Lahore that leads towards further extreme cold weather that breaks the thirty-five-year record. In 2020 urban flooding in Karachi and other districts of Sindh are witnessed of climate change that rain broke the ninety years record. According to scientists, the temperature of the globe increases another 4 degrees. The international bodies agreed to maintain the earth temperature at 1.5 degrees but no steps were taken towards its implementation. According to the American Meteorological Society temperature will increase from 3.5 to 7.4 degree Celsius at the end of this century. In 2019, in Australia wildfire erupted because of high temperature and according to scientists if the earth temperature is rising gradually then wildfire become the usual practice. The Conference of the Parties held every year in which two hundred member states participate and assess which country is at high risk regarding climate change. Unfortunately, among two hundred member states, Pakistan number is 7th. Although, Pakistan is not contributing.

In Pakistan, the entire country is warming, while in the north, snow melting is faster. The water flow in the Indus is due to the melting of the northern mountains. Most of the water flows into the Indus River within three months. These three-month changes are critical to us, and therefore have a negative impact on agricultural and fishery activities. Due to climate change, the summer starts earlier, and as the snow in the northern region continues to melt, and the timing of the flow of the Indus River changes, the summer becomes warmer. For us, this is an earlier flood disaster, because agricultural and fishing activities were carried out according to the previous Indus schedule. If the water reaches the river early and affects farmers‘ crops and fishermen‘s fish, the entire food chain in Pakistan, especially in Punjab, are disrupted.

How to deal with climate change? Through indigenous adaptation strategies and the struggle to mitigate climate change. This means reducing greenhouse gas emissions and adopting natural methods and simple ways of making a living. How to deal with climate change, because whether the community likes it or not, climate change is happening. There are some solutions. First, the government should invest in the people, especially those who directly rely on climate change or natural resources for their livelihoods. In Pakistan, there are no recognized climate scientists, and there are very few studies on the impact of climate change on Pakistan, especially on the impact of fishing communities on the Indus. Start investing in those who don‘t understand the problem as soon as possible, and then be able to start adopting mitigation strategies. Nevertheless, there is still a need to change traditional fishing and agricultural practices. Climate change is a very serious problem, and there is no reason to ignore it. Develop and formulate policies to reduce human activities to protect the earth, because there is no other planet besides the earth.

The impact of climate change, vulnerabilities, indigenous adaptation and mitigation strategies. All of such type of actions with regard to climate change has to be from the context of food security and economic development for the fishing communities no matter inland or marine. There is food insecurity, malnutrition and poverty because of climate change. There are objectless livelihood activities, object hunger and object conflict over natural resources such as river water and land. Fisheries play a key role in food and nutrition security. The level of contribution of fish to animal protein consumption is much higher in the least developed countries particularly the low-income food-insecure countries run on the average. Fisheries also contribute very significantly to socio-economic development and the value change through the production increases step by step. The ultimate position is at approximately more than 10% of the population of the world dependent on fisheries for their livelihoods.

The pathways of climate effects and impacts in fisheries are quite complex. The rainfall is affected, river flows are affected and the lake level is affected. Also, they affect the production of fishing, ecology, communities, society and the wider economic system. The impacts of climate change can be specified on various levels aspire diversity and production. The climate change effects distribution of food, disease, it affects the operations on safety and efficiency various losses and damages to assess risks to health and

life displacements. The climate change effects fish transportation from the river to the market and fish stock. The small scale fishing communities and fishing persons catching their fish from Indus River with traditional tools well maybe not in the future have the fish within reach of how far they can cast to make a living so they need to adapt and to develop methods how they can follow the fish further out into the river water opportunities.

The problems related to fishery industry of Pakistan like illegal, unreported and unregulated fishing like the areas where the fish hunting is prohibited or the season in which the fish hunting is prohibited the rearing seeds and the breeding seasons but people do not care about the laws and lack of research. The fishery department continuously lacking good researchers and good infrastructure. There is a lack of concept that people should not hunt fish during the breeding season particularly through electrical shocks as a result, fish nursery destroyed. The district government fishery department lacking management measures. The other is increasing water pollution that causes hypoxia for fish.

Depletion of water plants and shrubs they act as producers there are the firs profit level so if there are no plants in the river and so they cause a bad impact on the fish population. Less interest in establishing value-added industries there is no concept like what we are what are behaving with milk industry is the same as in fish industry that we import only the raw fish we don‘t make any added value-added products that can give us more and more price. It's checked off recent floods because we know in recent years Pakistan has faced very bad floods export of fish.

Illegal fishing activities are other contributing factors along with climate change. There is a violation of the zone for which licence is authorized. During catching fish the non-targeted species are also caught along with targeted species. The species that are going to extinct or that are endangered species that are declared as endangered species but people don‘t care about that we should preserve that species they hunt them very carelessly illegal fishing by fishermen. They use dan fishing nets like that are harmful to fish expensive species like dumb are is depleting fish is being caught at the juvenile stage to be added in 40 feet. The juvenile stage is the fish stage at which the fish is actually at the stage where it cannot beat but it can feed itself and near to dirt lack of research there is a lack of research on improvement of fishing resources aquaculture, breeding techniques, destruction of the ecosystem and alternative livelihood opportunities with regard to natural resources.

The research is not being given due to priority non-enforcement of the repeated fishing season June and July are not suitable for fishing because of the breeding season and also the monsoon season. However, the fishing persons does not stringently follow due to lack of alternative source of income as a third phase depletion of dumbara and other endanger species management measures like limited entry, the total allowable catch is not defined that fishermen can guard and can get only that much amount of fish grip limits and closed season that should be under the control of the government but unfortunately, there is no control. Lamprey pollution increased the level of river pollution. The most of the waste water of big cities and industries are deposed through nullahs in the Indus River which cause destruction of riverine life. In Pakistan, there are a few valuable fish-related industries. The investors are reluctant to invest in this sector incentives are being given back so freeze and flood. An exporter fish despite being the popular dish per capita consumption inflation person is the lowest in the world with only two kilograms per year compared to one average of seventeen kilograms per year.

The researchers used some ways the fishing people would provide to adjust to changes in climate. climate change. The fishers use present and local information and knowledge to deal with hazards to clarify changes and determine countermeasures. Nevertheless, the study population clearly abstracted the limitations of such measures. So far, many people do not know whether their current quality is sufficient to adapt to climate change. Many people are sceptical about solving the difficulties they have encountered.

The fishing community especially women that addressing changes in climate way sighted it in the total of environmental debasement and societal decomposition. Addressing climate change also way acknowledge their function, knowledge and power as climate affable. The environment farmers and not peripheral their tiny standard fishing boats and tools through agriculture climate amicable systems. Finally, it means not swing up any hurdles to their joint force and repercussion, and leveling the ones that stamp down their built-in capability to initiate and solve.

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APPENDIX

Interview Guide

Name _____

Age _____

Caste _____

Economy _____

Marital Status _____

Type of Family _____

Children _____

Religion _____

Education _____

History/Introduction of the Village and community

Ask to the respondents about the area and its main features. Explain the locale graphically what the village is like. The riverine, the surrounds, the layout, the houses, & the people who live there. Provide a descriptive note on their culture, values and language. Also, ask the respondents about their interests, their daily routine and activities in which they are usually involved. Observe all these keenly. Describe these with a ‗climate change lens' in your eyes – try to notice how the fishing community lives are difference because of changing climate, why & in what respects, from men. Also notice - & try to explain – the overlaps

What this village known for?

Which prominent caste live there?

How village people live together?

Explain village physical structure (streets, roads, facilities, houses)

What are your major sources of income?

What is the status of girls in the community?

Is your any girl‘s school in the community?

Do children of your respondents especially girls attend the school/college

To which profession people of the community mostly involved in?

What languages you speak?

What are the prominent features of your culture?

Is there a village council/committee?

How is it run?

Who runs the village?

Who has the ultimate power in the village to give the final word in everything?

What ethnicity are there?

How do you go about the business of your _everyday life‘?

What do the man and women do primarily?

What do you eat & how do you spend your lives?

What do you aspire to?

Personal and Financial

What type of family you lived in?

What are your major responsibilities towards your families?

Who holds the family?

Do you able to take your own decisions?

Do your husbands involved them in taking important decisions of your lives?

Do you feel that you are important art of your family and in what aspects?

Why you involved in Pulses production? And for how long?

Is this your own decision?

Do you find this work useful for your family?

How long you work in the field?

When you come to the field and how? (by walk or by using some sort of transport)

How you spend your time after finishing work in the field?

Is there any set wages for the women working in the pulses production or how wages are set?

How much you earn from it?

How you spend your money?

Do you keep your money or give to your husbands?

For what purposes you often used your own money?

Do you able to save what you earn?

What means you used for saving money (bank, personally, or invest with someone)

If using bank or have some investment, who go to the bank?

On whose name bank account is open?

Are you able to handle and control your money?

Do you think that earning money changed your status in the family?

Do you remember any incident when found find your earning useful for the family? (try to quote at least one incident (time of trouble, sickness, or marriage) where you use your money.

Climate Change

Give the narration of climate change as you understand it.

How the members of one family perceive climate change differently?

What is your idea about climate change?

How you perceive climate change process

Is climate change really happening around?

How can you explain the change in the temperature in past few years? (less/more clod or less/more hot)

How you get the idea that there is change in the climate (try to get some native ideas regarding climate change)

Do you think that climate change affected your lives and especially your work (pulses production)? If yes, how?

When is pulses produced (season) how this is changing due to climate changes?

Is climate change affected your income/wages (due to season changing)?

Is climate change affected your farm and animals?

How young girls & older women perceive work changes during such circumstances? (try to get some quotes and native understanding about climate change exist among two generations---old and young)

Does there single understanding of climate change exist or it differ with the difference of class, age and ethnicity?

How community lifestyle changes with the change in climate?

Is there any change happen among the community regarding food choices, housing settlement, and clothes selection?

Do you think that women are more affected with the changes in climate as compared to men?

What recent developments you can notice in your community due to climate change?

What strategies you opt to fight with the changes in climate?

What you think are people in your community prefer to move towards other places due to serious changes in climate/temperature?

Do you think that hot/cold temperatures have opened the door of other indoor work options (such as cleaning as housemaid) for women?

How climate change affected you while working in the fields?

Do you think your children are also suffer due to increase/decrease in temperature in any sense while you working in the field?

Do you think that changes in temperature also affect the manual work (work by hand)?

Do you think that land richness and capacity also affected by the changes in the climate?

What latest technologies you see in your field due to changes in the temperature?

What kind of coping strategies (such as is there any specific drink or food) you use to save yourself from hard weather conditions while working in the field?

In which season (winter/summer) you have enough work and why?

What season you prefer to have work in open fields and why?

Do you need to save some money for either season (summer/winter)? If yes, why?

Do you think local authorities/governments initiate some step to control climate changes?

What is your opinion about government role for the betterment of women field workers?

Do you have any suggestion to improve the livelihood conditions of women working the field especially those who are affected by the changes in climate/temperature?

Note: The above interview guide is to help the researcher to ask some relevant questions from the respondents. A researcher can ask other related questions, if relevant to the topic. Try to ask in-depth answers to the respondents and explain climate change and the community lives with holistic point of view.

THANK YOU

GLOSSARY

Glossary (Climate Change)

Local Words/Terms	Meaning
Akara	Due to excessive use of *possy* a disease affects the people and their body can be senseless.
Barkat	Prosperity
Bazurgs	Elders
Chaddar	A long piece of cloth usually uses women for Purdah.
Channa	Chickpea
Chappar	Something like veranda made with wood, mud with thatched roof. Used in summer sit and take rest.
Chulha	A dedicated and raised fire place at the home for cooking
Dagree	A clean place where crop is collected and thrash.
Dama	A disease that cause problem in taking breath
Deharri	A work of daily wage and also its payment called *deharri*
Dodh soda	A mixture of milk, water and cold drink name 7up.
Ghem	Slightly due
Ghota	A drink this make with sugar, water and almond.
Honkerri	Breath problem
Honkerri	Due to extreme warm weather animal have breath problem and take long breath in such situation animal can die.
Ispaghol	Ispaghol husk
Jatt Vahee	Agricultural work
Jawar	
Kachi lassi	A mixture of usually un-boiled milk, sugar or salt and water. Use at the evening time in the village.
Khal	Water channel
Khud mukhtiar/mukhtiar kar	Independent or the head of the household
Kumarran	Due to warm weather and lack of rain trees growth affect badly
Kumarren	Not growing well
Mahi	Made with yogurt, water and sugar.
Murabba	In the Thal desert 10 acer of land is equal to one *murabba.* In canal and riverine areas one *murabba* is equal to 25 acer of land.
Nerhann	Breakfast
Nerhann	Breakfast
Pakki lassi	A mixture of yogurt and a little bit water. Use at breakfast time and lunch time in the village of Punjab.
Pani Wattay	
Phareend	Economic condition
Phura Parree	Hard work to earn bread and butter
Phura Parree	Work hard and earn livelihood
Possy	A wet chaddar (cloth) when take rest at day time and night time both

	old age people and children in case of extreme weather use possy. It is used in the month of Jeth – Harh
Qurbani	Sacrifice the animal on the occasion of Eid-Ul-Adha by Muslims all over the world.
Rashame	Silk
Rashes	An area of redness and spots on a person‘s skin.
Saiba	The rain water preservation in the land
Saiba	Water preservation in the land
Saro	A disease of *channa* crop in extreme winter and plants become yellow and burn
Shaur	Awareness
Shekanjbeen	A mixture of lemon, water and sugar.
Skrund	Hard
Sohan halwa	A locally made with milk, sugar and *sohni* – a little bit grind grow wheat.
Sufaida	Populus ciliate, the Himalayan poplar, is a large deciduous tree with tall clean straight trunk.
Tall marna	Weeding
Tandoor	Oven
Tawa	An iron made and round shape
Tayra – Veera	A local variety of cloth and they have lower prices than lawn and cotton.
Theka	A verbal agreement between workers and landlords
Tukhum belangu	They are small seeds which swell when put into water. It is used in Faludah, Sharbat – sweet drink, cold water, milk etc. its effectiveness is cold – provides coolness in in the body and provides energy to the brain.
Warf	Ice
Wasib	The people of the village other than relatives called *wasib* or wasibi.