

THE PERCEPTION OF LOCAL COMMUNITY ABOUT CLIMATE CHANGE AND ITS IMPACTS ON THEIR LIVES AT *TEHSIL* TIMERGARA, DISTRICT DIR (LOWER), KHYBER PAKHTUNKHWA PAKISTAN

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ABSTRACT

This preliminary study was conducted in order to know the perception of local communities of *tehsil* Timergara, district Dir (Lower), Khyber Pakhtunkhwa, Pakistan towards climate change during September through November 2014. The study was aimed to identify the impacts of climatic changes on the lives of local people of the study area, based on the last few years or a decade or two. The study was conducted through administering a questionnaire to educated subjects while semi-structured interviews were conducted from illiterate ones. The local communities' perception was assessed both quantitatively as well as qualitatively. All recruited respondents were of the opinion that climate change has visible changes in their lives. All the respondents pointed out a reasonable risk of climate change affected their lives and still continue. Their response demonstrated that change in climate is having an equitable risk to lives of Dirvis. The recruited subjects was more inclined towards the negativism (negative impacts of climate change) than positivism (positive impacts of climate change), as perceived by them. Mass awareness campaigns by government and environmental protection agencies is recommended in order to educate local communities regarding basic threats from climatic change through pollution. All those anthropogenic activities and sources that lead to trigger climatic changes, global warming, and greenhouse gases production should be addressed properly on priority basis.

Keywords: climate change, global warming, greenhouse effect, droughts, biodiversity

INTRODUCTION

Changes in atmospheric temperature as well as periodic rainfalls are referred as climate change. Change in climate is attributed to many factors such as deforestation, fossil fuel combustion, and pollution due to emissions from vehicles, domestic chimneys, industrial exhausts and building materials manufacturing companies. Climatic change is being observed throughout the world on account of industrial revolution and other advancements made in different fields. Emission of certain noxious radiations from electronic and other day to day usable things are also contributing to changing climate.

Climate change resulted in different changes in humans' surrounding such as temperature got increased; rainfall got decreased and resulted in floods in different part of the world, so as in

Pakistan (Shakoor et al., 2011). Climatic change is an emerging issue on both national as well as international level and is the major cause of destruction throughout the globe (Ahchong and Dodds, 2012). Climatic alterations have threatened wildlife, fuel woods, human health, food availability and water availability (Ishaya and Abaje, 2008). Owing to the current scenario of climate change every country should identify their own environment and should work out good enough strategies as remedy towards climate change (Leiserowitz, 2006). Policy should focus the challenge of alterations in climate, should respond with effective and safe remedial measures, and should carry out research projects to cope with the changes (Khan, 2011). These strategies of adaptation should be undertaken at local communities' level for making it more effective and workable.

On account of high and peaked mountains, arid plains, and low lying range of shoreline,

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Pakistan is at particular risk to face the ill-impacts of general climatic change. Pakistan is also one of the twelve countries that are thought to be highly exposed countries having higher degree of chances to address climatic changes (John and Usman, 2006). It is forecasted that drought, heavy rainfalls, loss of agriculture production and rise in temperature, expected in future, will affect approx. 40% of Pakistanis (Shakoor et al., 2011). It was also stated in fourth assessment report of Intergovernmental panel on climate change that rains will be on increase in near future due to change in climate in northern parts of Pakistan (IPCC, 2007). Due to unpredictable and unexpected array of precipitation in Pakistan, local people are in a tough situation and struggling for their own safety, safety of crops and livestock such as the great 2010 flood causing approximately 2000 mortalities and destroyed more than 700,000 buildings, houses and other infrastructures (Salma et al., 2012). Owing to the unpredictable and unexpected scenario of climate change, the present preliminary study was aimed to find out the perception of local community towards climate change at tehsil Timergara, district Dir (Lower) Khyber Pakhtunkhwa Pakistan. Our study identified different effects of climatic change on different aspects of Dirvi community such as temperature, health, food, precipitation and livelihood. An effort has also been made to put forth some necessary recommendations for policy makers could be handy for the developmental predilections of the study area in specific while count in general.

MATERIALS AND METHODS

Study Area

District Dir (Lower) is situated in the northern part of Pakistan, with Longitudes of 34°, 37' to 35°, 07' North and Latitudes of 71°, 31' to 72°, 14' East (Ullah et al., 2014a). Dir (Lower) is having an approximate elevation of 2700 feet (820 meter) above sea level and experiences an annual rainfall of 1468.8 mm during December and 253.7 mm during March (Ullah et al., 2014b). District Dir (Lower) is bounded by district Dir Upper to the Northern Side, district Swat to Eastern side, district Malakand to the Southern side and Bajaur and Afghanistan to the Western side (Ullah et al., 2014c). District Dir (Lower) is consisted of seven *tehsils* namely Timergara, Balambat, Khal, Lal Qila, Samar Bagh, Munda and Adenzai (Ullah, 2014). District Dir (Lower) is abode to a river by the name of Panjkora and three large streams, namely Asegal, Konhaye and Rhound with many sub tributaries (Ullah et al., 2015). River Panjkora, initiating from Kohistan in district Upper Dir, flows southward and enters district Dir (Lower) at Addo (the junction of Tormang and Akhagram at tehsil Khal, Union council Shalfalam). The river continues its journey throughout the district, dividing the district into two halves and joins river Swat at Bosaq pull, Sharbatti. Konhey and Rhound streams fall into the river at Koto and Thrai by pass respectively (Ullah et al., 2014d). Figure 1 is showing study area, modified from Muhammad et al. (2014).

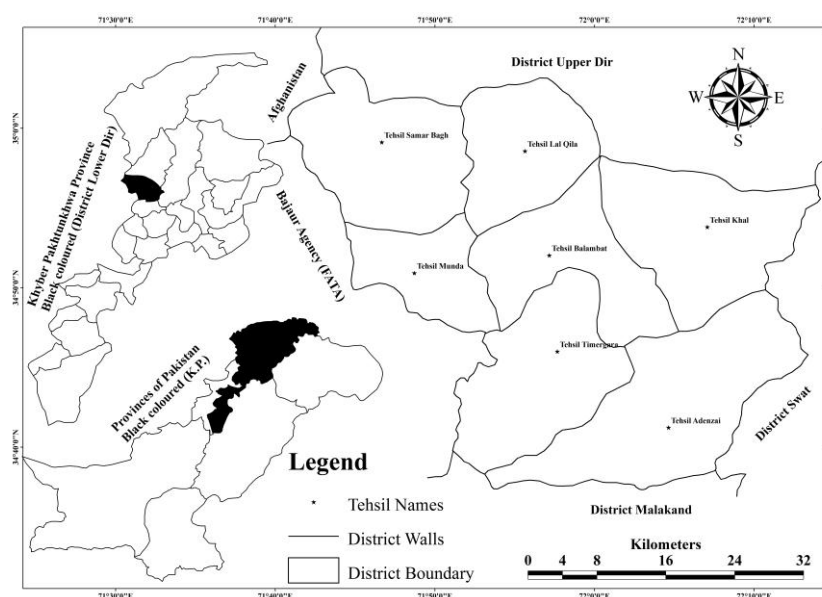


Fig. 1. Political division of district Dir (Lower) and its geographic location

Sampling, Data Instrument and Analysis

This cross sectional descriptive natured study was based on random sampling. A questionnaire was distributed among 207 total subjects, belonging to tehsil Timergara. The questionnaire was having questions regarding social demographic variables of the recruited subjects including age, educational level, occupation, and origin (rural/ urban), and three open ended questions, adopted from Maryam et al. (2014) with some modifications. As these questions were open ended, so all the recruited respondents were allotted enough time to answer in detail about their perceptions regarding climatic change. The questions asked during interview and included in the questionnaire are given in Table 1. The illiterate respondents were in depth interviewed in native language of the study area, Pashto, in order to know about their perceptions to the fullest regarding climate change in their vicinity. Response rate was 100% during the study area. The acquired data was analysed through percentage method using SPSS Version 20. Variable regarding source of information were imperilled to ANNOVA test for finding significance at $P < 0.05$, $df = 8$ and confidence interval =95%. Map for the study area was prepared using ArcGIS 9.3 version.

Table-1: Questions included in the questionnaire/ asked during interviewing the illiterate subjects

Q. No.	Questions asked
1	Do you think there is any change in the climate in the past few years or decade?
2	In your perception, is there any positive impact of climate change on your life?
3	In your perception, is there any negative impact of climate change on your life?
4	Source of Information regarding climate change? Print Media or Electronic

RESULTS AND DISCUSSION

During the study period, 207 total respondents were recruited for this specific survey type study. The subjects were from different age groups (as shown in Figure 2), having different educational level (shown in Figure 3), from different origin in term of belonging to rural,

peri-urban or urban areas (Figure 4) and having different occupations (Figure 5).

The present preliminary study showed that the people of district Dir (Lower) know about their surroundings and have knowledge of the changing mood of climate and atmospheric conditions. All the subjects, in any form either positive or negative, have perceived climatic change over past few years or a decade or two. It was observed that both the literate as well as illiterate respondents awareness but the literate ones and specially those with higher education know more about their environmental changes and its ill effects such as disease outbreaks and floodings etc.

The questionnaire administered was having semi-structured questions regarding climatic change in order to fully assess the perception of the recruited subjects regarding climatic change. The illiterate respondents were interviewed in their native language in order to make them feel comfortable and make data collection easier. The questions were given with the option of answering in yes or no. Justification was also asked from the respondents in order to know that why they answered the questions included with yes or no. The response of the recruited subjects for question 1 is given in Table 2, question 2 in Table 3, question 3 in Table 4 and question 4 is given in Table 5.

In response to question regarding knowing respondents view about climatic change occurrence, a major portion of 98.1% subjects answered that yes climate change has affected their lives while a meagre 1.9% answered in negation, as shown in Table 2.

Table-2:. Response of the recruited subjects to Question 1

Response	Number	Percentage
Yes	203	98.068
No	4	1.932
Total	207	100.00

Table 3. Response of the recruited subjects to Question 2

Response	Number	Percentage
Yes	28	13.527
No	179	86.473
Total	207	100.00

A narrower portion 13.53% of the recruited respondents were of the view that climate change in the study area had some positive impacts on their lives while 86.5% were of the view that climate change has no positive impacts on human life in the study area, shown in Table 3.

Table 4. Response of the recruited subjects to Question 3

Response	Number	Percentage
Yes	182	87.923
No	25	12.077
Total	207	100.00

Of all the respondents 89.9% were of the view that climate change has negative impacts on their lives while 12.1% replied in negation that there is no negative impacts of the changed climate on their lives, shown in Table 4.

Table 5. Response of the recruited subjects to Question 4

Response	Number	Percentage
Print	129	62.319
Electronic	70	33.816
Others	8	3.865
Total	207	100.00
P Value	P<0.0001	Significant difference

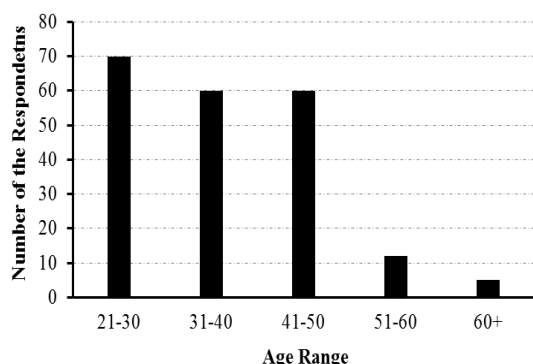


Fig. 2. Age groups of the recruited respondents

The results of the present study depicted that Print media is still the most accessed media for the people of the study area as well as print media is conveying more information than electronic media to the people of the study area.

The difference for the three option given to this variable was calculated to be $P < 0.0001$, which was found statistically significant at $P < 0.05$ ($df = 8$; Confidence Interval = 95%). Of the total 207 respondents 62.32% told that the source of information for them regarding climate change is print media while the rest 37.7% replied that electronic media conveyed them information regarding change in climate.

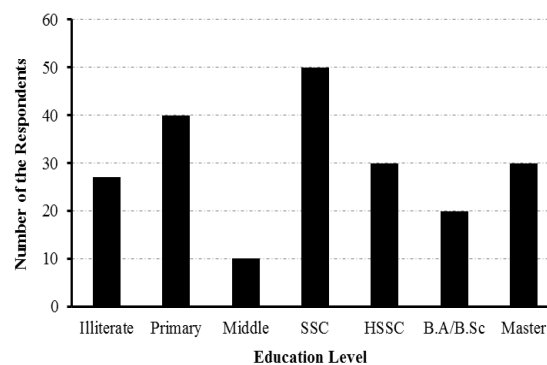


Fig. 3. Education and literacy level of the recruited respondents

Of the total respondents 33.82%, 28.99%, 28.99%, 5.8% and 2.4% respondents were from 21-30, 31-40, 41-50, 51-60 and 60+ years of age respectively.

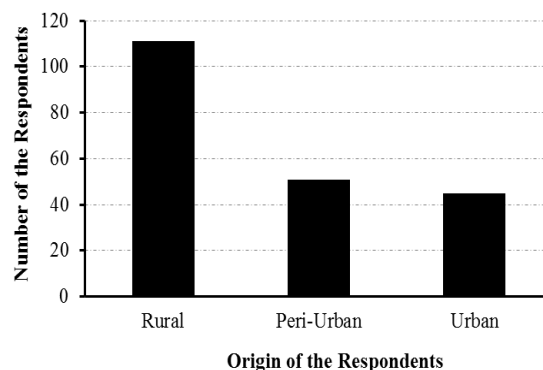


Fig. 4. Source of origin of the recruited respondents

Of the total respondents 13.04% were illiterate while 86.96% were literate. Of the total 180 educated subjects 19.3% were having five years education, 4.8% were having eight years education, 24.2% were having ten years education, 14.5% were having twelve years education, 9.7% were having fourteen years of education and 14.5% were having sixteen years of education.

On account of swift growth in Pakistani population and increasing drift in urbanization, cities are growing rapidly thus immersing suburban and rural populations. This results in transforming the household structure and socioeconomic status of these communities (Arif & Hamid, 2009). In this confusing scenario most of the researchers got confused in identifying rural and urban communities.

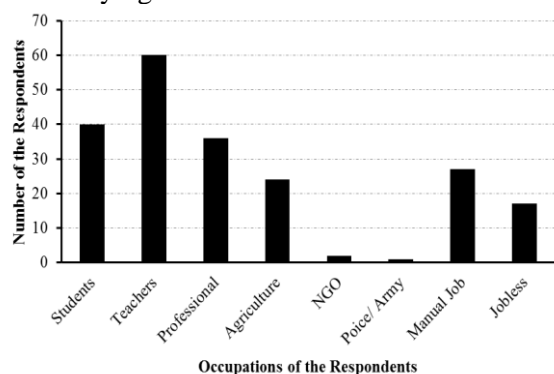


Fig. 5. Occupations of the recruited respondents

Several of these researchers use the definitions of rural, urban or peri urban to avoid this contradiction (Jabeen and Malik, 2014). The same approach was adopted during this study as well and the total subjects were divided into rural, peri urban origins and urban origin. Of the total respondents recruited in the present study, 53.6% were belonging to rural areas, while 24.64% and 21.74% were belonging to peri urban and urban areas respectively.

The subjects were having a wide variety of occupations. Therefore this category was further divided into eight sub categories including students, teachers, professionals, agriculture, NGO/ Social workers, police/ army personnel, those doing manual jobs and jobless respondents. Professionals were consisted of doctors, engineers, key punch operators, office boys, business men, and health workers etc. Of the total 207 recruited subjects, 19.3% were students, 28.99% were teachers, 17.4% were professionals having different fields, 11.6% were busy at agriculture, 0.97% were working in different non-government organizations (Social workers in projects working for human health and environment), 0.5% was police personnel, 13.1% were busy doing manual jobs while 8.2% respondents were jobless.

The respondents supported positive impact on account of climate change stated that climatic alteration resulted in elevating their different

activities such as social, business, agricultural, educational, political and economic activities specifically in winter season (IPCC, 2007). On account of normalisation of temperature new ecosystems came into being, ultimately led to wild animals survival, thus beneficial for conservation point of view (Ilyas et al., 2012). Decrease in temperature also resulted in low bonfire as compared to past, which enable people in their surrounding to work and do jobs easily.

The agriculturist and farmer responded in positivism when asked about the positive impacts of climate change. They urged that warmer conditions led to enable certain warmer varieties of fruits and vegetables such as sugar cane, mangoes and tomatoes to grow more swiftly, thus elevating food production (Ahmad et al., 2013). According to them, warmer environment comparatively reduced fruits ripening time and require less time to be harvestable if compared with past.

According to some subjects, decrease in rainfalls enable them to be more comfortable with their life style. They further urged that warming of the climate resulted in rising water level on account of which frequent waer supply made irrigation easy. Thus ultimately result in high yield of crop with low labor and hardwork of watering the agricultural fields (Hussain, 2013). A few respondents were of the opinion that decrease level of snowfall resulted in sparing some vegetables and crops to be safer, those were spoiling due to snow fall in past. Grazing cattles are quite easy in warmer condition as compare to colder past (Sayed, 2011).

A majority of portion from the respondents replied that climatic change has imposed some negative impacts on their lives. They urged that climate change has been the main cause of floods in their area and warmer climate resulted in recent floods (IPCC, 2007). They added that warmer climate has triggered different hazardous consequencies such as melting of glaciers which ultimately resulted in further warmth of the climate, and removal of fertile soil cover from agricultural fields and orchids of fruits. According to some subjects, they use to feel easier in colder climate than warmer, hence climate change has changed their life style.

The professional occupants especially doctors, biologists and those busy with human health related activities urged that climate change

resulted in higher prevalence of different diseases (Sayed, 2011). They urged that heavy rainfalls, humid environment and warmer temperature resulted in production of breeding sites for different types of insects and other infectious agents which can pose a serious threat in the form of epidemic any time (Lutambi et al., 2013). This can be miserable if did not addressed properly right this time. The supporter of negativism regarding climate change further added that warmer favourable climate for spreading diseases can lead to different types of respiratory disorders, pigmentation on skin and other skin diseases (Maryam et al., 2014).

Some of the respondents told that climate change has resulted in lesser greenery and shortening of trees. Climatic change has also resulted in drinking water scarcity through lowering table of groundwater. This led to droughts as well soil became eroded (Shakoor et al., 2011). Some of the respondents also added that climate change has resulted in dried natural springs nearby them. According to them warmer climatic condition favour reproduction of insects (Lutambi et al., 2013), which lead to elevated number of mosquitoes, wasps, spiders, termites, centipeds, milipeds, ticks, flies, caterpillars and bugs. This also resulted in higher number of snakes, lizards, frogs, toads, tortois and other poisonous reptiles and amphibians. Higher level of insects (pests) resulted in reduced production of corn, fruits and different types of other crops.

Global warming on account of change in climate has already hindered normal life routine, live millions and destabilised ecological equilibrium to a greater extent (Hossain et al., 2013). Some of the subjects added that global warming and greenhouse effect is attributed to change in climate (Sayed, 2011). The perception regarding climate change and global warming may be because of the higher accessibility of the respondents to print as well as electronic media. As these both focus and discuss the environmental problems to a higher extent these days. Many of the respondents urged that climate change has resulted in decrease in electricity and increase in its demand. They further added that on account of loadshedding and unavailability of electricity, they often troubles in summer season (Hussain, 2013).

The respondents aware of botanical aspects of

environment urged that climatic change has resulted in vanishing diversity of plants, especially medicinal plants (Friesinger and Bernatchez, 2010). The current scenario of climate has resulted in elevated amount of disease outbreak in animals and plants. Similarly low temperature resulted in disappearance of certain species of wild plants and animals. Spraying against these insects, pests and other harmful organism resulted due to climate change account for economic loss (Nafees et al., 2008). According to them the changed climate has also resulted in changed sowing season of various crops, vegetables, fruits and other plants (Bulkeley and Betsill, 2005). Similar subjects associated with business told that their business is very much affected due extreme weather specially during summer (Bormann et al., 2012).

CONCLUSION

The present study concluded that the recruited local respondents were having enough knowledge regarding climate change and their impact on their communities. The impacts pointed out by the subjects were in the form of affected lives which is still in progression. Their response demonstrated that change in climate is having an equitable risk to the lives of Dirvis. Mass awareness should be a part of environmental protection planning. All those human activities that leads to environmental pollution such as global warming and greenhouse gases production should be properly addressed.

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