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**HOW DO WE PERCEIVE CLIMATE CHANGE?
DIGGING DEEP IN TO THE PUBLIC CLIMATE CHANGE AWARENESS AND BELIEFS
IN THE URBAN COMMUNITY OF SOUTHERN PUNJAB, PAKISTAN**

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ABSTRACT

The growing concern about climate change has rung its bell across the globe and thus the need of devising appropriate mitigation strategies has become inevitable to address this global issue. Climate change mitigation policies cannot be successfully implemented without considering the perception and acceptability of general public about this global crisis and the suggested tools to mitigate it. This study was designed to assess the climate change literacy and awareness among urban centers of Southern Punjab, Pakistan. The studies revealed that majority of the people living in this part of the country were well aware of the changing climate and had fairly clear opinion about the responsible agents for this change. Social media seemed to be the most influential source of educating people on this issue. However, the study highlighted the room of improvement in Government's role to launch better campaigns which might involve people as stake holders in climate change mitigation process.

KEY WORDS

Climate change, perception, urban areas, anthropogenic factors, heat waves.

The affair of climate change has now been on the scene for almost two decades and its entanglement with the developing countries, which are environmentally vulnerable, is clearly visible now (Rehman & Shah 2012). Pakistan is no exception to many of the South East Asian countries which are experiencing visibly grave impacts of climate change (Malik et al. 2012). In Pakistan, the dramatically changing climatic conditions have exercised such impacts in the last 5-10 years which cannot be masked by any argument (Khan et al. 2012). History's worst droughts in desert rangelands (Pasha et al. 2015), devastating and frequent floods in South Punjab (Hashmi et al. 2012), and unexpectedly lethal heat waves in Karachi (Chaudhry et al. 2015) speak volumes of how different ecological zones of the country are already suffering at the hands of climate change.

Climate change appears to be exercising effects on both urban and rural communities. The impact of climate change in urban areas however requires special attention for comprehending its complicated existence and devising meaningful plans to address it. Cities have a direct relation with the climate change because they are the centers of generating the greenhouse gasses and could be the best places to introduce the counter plan to start mitigating climate change. Besides, urban centers are too important in terms that they have large population that can be highly devastated from the climate change consequences (Satterthwaite et al. 2007).

Devising practical, target-oriented and publicly acceptable mitigating strategies for combating climate change has now become a thing of grave importance. There has been a global consensus on the fact that practical and fruitful strategies for mitigating climate change cannot be made possible without considering the perception and preferences of the local communities on this issue. Various case studies of the implication of apparently sound climate change mitigation plans have revealed that the lack of public awareness about the nature and sensitivity of climate change has been the foremost barrier to the success of mitigation policies. Having insufficient awareness and information about an issue clearly

means that no matter what mitigation plan is brought to them, people are most likely to either reject it or take it as a second or third grade problem (Spence et al. 2011).

We conducted this study to assess the public perception of climate change among the urban centers in Southern Punjab, Pakistan. We focused this part of the country since, in the recent past, this area has experienced significantly higher rate of climate change adversities and therefore requires immediate actions for implementing mitigation plans (Rehman & Shah 2012). Since public perceptions can either make or break an economic or social action (Leiserowitz 2006), this study was therefore designed to quantitatively describe the literacy and cognition of climate change among the urban communities of Southern Punjab, Pakistan. The results of this study are intended to be a base line study for the policy makers and climate scientists to make deeper inroads in formulating effective mitigation policies for this region of the state.

METHODOLOGY OF RESEARCH

In order to assess the awareness and perception about climate change and its recognition as a rapidly emerging threat, a survey based study was conducted in the urban centers of South Punjab, Pakistan. The cities selected for this study were Multan, Khanewal, Lodhran, Vehari, Muzafargarh, Rahim Yar Khan and Sadiqabad. The assurance of a successful survey is dependent on the diversity of the sample selected (Leiserowitz 2006). It was ensured that different age classes and people from different education levels were approached so that a balanced and accurate point of view could be attained. The size of questionnaire was kept concise but it was up to the mark. We intended to spend 12-15 minutes per person and were successful in achieving this goal. The actual sample size of respondents selected was 225.

In random sampling of the urban population of the targeted region, respondents from different age classes (ranging from 16 to above 50), gender (male and female), qualification (ranging from illiterate to post graduate) and income level (starting from PKR 10,000 to PKR 100,000 and above) were interviewed to ensure comprehensive representation of all socioeconomic classes of the urban community. Subsequently, the data was subject to statistical analysis using IBM SPSS Statistics 21.

RESULTS AND DISCUSSIONS

Background Information of the interviewees. Fig.1-4 shows how we sampled respondents from different age classes, gender, and income and education levels. Such a diverse sampling was made to ensure that the computed results would depict the perception and understanding levels of all sectors of the selected community on climate change and mitigation strategies for it.

Figure 1 – Age group distribution of the respondents

The respondents were sampled from both the genders (male and female). There were five age classes (16-20 years, 21-30 years, 31-45 years, 46-60 years and above 60 years), five income classes (PKR 10,000-20,000, 21,000-40,000, 41,000-70,000, 71,000-100,000 and above 100,000) and 6 classes of education levels (illiterate, under Matriculation (primary school), Matriculation (high school), technical diploma holder, graduate (college) and post graduate (university graduate)).

Figure 2 – Income distribution among respondents, PKR

Figure 3 – Gender distribution among respondents

Figure 4 – Education level among respondents

Interviewee's Cognizance of Climate change. The initial questions asked were meant to determine the level of awareness and literacy of respondents about climate change. A large number of participants (68.44%) responded that they knew about climate change (Fig.5). When asked about the source of knowing climate change 35.1% people indicated electronic media and 31.56% people indicated social media as the source of their information (Fig.6). The next question was asked to know how actually the respondents interpret the term "climate change". Our results indicate that according to 77.3% of the respondents, climate change meant 'fluctuation of temperature' while 10.22% thought fluctuation of precipitation is the climate change according (Fig.7). The respondents were later asked whether the area under tree cover has increased or decreased in their near vicinity and 81.78% of the interviewees responded that it has decreased dramatically (Fig.8). Continuing from this question we asked if the decreasing tree/forest cover would have any effect on the environment and 87.5% of the respondents opined that they firmly believed that decreasing tree cover would increase the global warming both regionally and globally.

Figure 5 – Have you ever heard of climate change?

Figure 6 – How do you came to know about climate change?

These results established that the people of southern Punjab are quiet well aware of climate change and this was anticipated since the people of this area are frequently experiencing the impacts that climate change in the shape of frequent cataclysmal floods and torrid heat waves. The communities having firsthand experience of climate change are more likely to know and believe it (Spence et al. 2011). As suggested by (Sheedy 2011), social media, these days, is the most prolific source of information among masses as the mean time spent on social sites by a single person is five and half hours a month. This might explain why the respondents held social media responsible for education them about climate change. As deforestation is in the mainstream all around the world, Pakistan's forest are also being overwhelmed by this deed (Ahmad et al. 2012).

Figure 7 – In your opinion which term of the following define climate change?

Figure 8 – What is the status of tree cover in your surrounding?

This was being reflected by our respondents when they were asked about the tree cover in their area. The forests are a store house of carbon and will prevents the earth temperature to escalate (Stone & Chacón León 2010). Our respondent's perception was in line to this statement and was well aware of the decreasing forest cover and its relation with climate change.

Duration of Climate change with respect to the interviewee's observation. Spence (2011) studied that common people cannot explain a complex phenomenon like climate change. They normally refer climate change to the daily weather and seasonal fluctuation. So in order to get the impression of climate change occurrence as a reality and its impacts, we asked the participants to tell if climate change was actually occurring or was it a mere myth for them. The results suggested that 95.11% people agreed that it was a reality (Fig. 9). We next asked them how long it had been since they had started noticing the change in climate. This question was aimed to assess of the public perception about the age of climate change. Results depicted that 72.1% people believed that climate change has been obviously felt in last 5 years (Fig.10). Next, we asked our respondents whether or not they had felt any change in the intensity and duration of summers and winters. Many a researcher (Spence, 2011; Myers et al. 2013) have argued that seasonal events and the weather are the primary means by which individuals can experience and observe the climate. An assessment of how people feel changes in the intensity of different seasons reflects how closely and intensely they've observing climate change. Results suggested that more than 90% of the respondents did observe that the length and intensity of summers had increased while the same parameters reduced for winter season as 76% people perceived that winters were becoming milder progressively and 86.2% people had a firm belief that duration of winters is on a decreasing trend. (Fig.11-14). This is a forewarning of global warming and its repercussions of increasing temperatures, shortening winters (Overpeck & Udall 2010) which

would be eminent in near future in not only in whole Pakistan but also especially in this region as well.

Figure 9 – Is climate change actually happening?

Figure 10 – What do you think from how long climate change is happening?

Figure 11 – Do you observe any change in the duration of summer?

Respondents Knowledge on Government role regarding climate change. In Europe, most of urban centers have reacted towards climate change by imparting powers to the municipal governments to control the greenhouse gasses released by cities. Active and working policies to prevent greenhouse gasses are most necessary component to encounter environmental problems (Bulkeley 2010). Coupled with attitude of masses, the role of government is pivotal in mitigating climate change. In Pakistan, Ministry of Climate Change is already working in this domain. However, in order to assess whether or not people had

enough information about this Ministry, we asked our interviewee's if they had knowledge on any Ministry in Pakistan (at Federal or Provincial level) specifically working on environment and climate change. Surprisingly, 57.8% of the respondents did not even know if government was running any such Department or Ministry (Fig.15).

Figure 12 – Do you observe any change in the intensity of summer?

Figure 13 – Do you observe any change in the intensity of winter?

Figure 14 – In your opinion is there any change in the duration of winter?

Similarly 60% people were unaware of any policy proposed or implemented by the Government for mitigating climate change (Fig.16). The level of information in public about Government's actions in this niche is a direct evidence of government's present role in disseminating information and implementing policies about climate change.

Figure 15 – Do you know if there is any ministry on environment and climate change working in Pakistan?

Figure 16 – Do you know about any policy regarding climate change?

Figure 17 – What is the most important environmental issue you are feeling now a days?

Interviewee's Perception of possible climate change causes/drivers. Earth's intermediate temperature is progressively on the rise since 1900 and has elevated up to 0.8 degrees Celsius. The pattern of earth's surface warming, sea level rise and glaciers melt are all aftermaths of this deadly climate change which is being induced due to the accumulation of CO_2 , and this accumulations culprit are human itself (Wolff et al. 2014). Considering this, we asked our respondents what in their opinion was the most serious consequence of changing climate. In response, 40.44% of the respondents told that the rising temperature is the most feared consequence of climate change for them while 24.4% of the respondents starred air pollution as a critical issue prevailing (Fig.17).

Figure 18 – Who is the driver behind climate change?

Figure 19 – What do you think increasing automobiles has to do anything with climate change?

Figure 20 – Does increasing use of electronic appliances contribute towards climate change?

The next crucial question was about the drivers of climate change and to this question, 65% of the interviewees responded that anthropogenic causes are the main drivers towards this chaotic change in climate (Fig.18). Respondents were of the view that the increasing automobiles and enhanced uses of electronic appliances (A.C, Refrigerators, etc.) were the leading agents of global warming which in result caused climate change (Fig.19,20). The respondents of the survey strongly believed that urbanization and expansion of the existing cities is also an agent triggering climate change (Fig.21). Respondents strongly agreed that the change in climate strongly correlated to increasing population and industrialization (Fig.22). The respondents were also questioned about if they considered the use of diesel generators safe for their environment. In response 80.89% people strongly disagreed to this notion (Fig.23). The havoc that human race is causing in the shape of climate change that it

is no more international terrorism that the international community has to shield but from climate change and it would be accurate to call it as the mother of all problems (Brown et al. 2007).

Figure 21 – Does overpopulation and urbanization has to do anything with climate change?

Figure 22 – Have industrial effluents playing role in degrading climate change?

Figure 23 – Does diesel generators affect our environment?

The result deduced from this study displays that people of this region affirm that humans are culprit in unsettling the nature's balance. Results depicts that the respondents are aware of the events of climate change are being arranged by humans itself and will bring severe consequences if not dealt with. The results also suggest the Government needs to make its relevant departments more efficient and active in education masses on climate change and proposing publicly acceptable policies which involve stake holders from all communities.

CONCLUSION

The study concludes that the people in the urban centers of Southern Punjab, Pakistan have fairly good awareness of climate change and social media is the most influential source of information for them. People in this part of the country have experienced long and harsh summers in the recent past which they believe is the most obvious form of changing climate. Moreover, people have shown little to no awareness about role of government in tackling the issue of climate change.

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