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[ORIGINAL RESEARCH ARTICLE]

People's Perception on Climate Change: The Context of Local and Global Discourse

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Abstract

Climate change has become a significant threat to mankind in recent years. For the development of various adaptation strategies, it is essential to comprehend how people perceive climate change and its indicators. With this consideration, climate change is a glocal problem and discourse that is both global and local in nature. The paper attempts to discuss and analyse on people's perception on climate change in both local and global contexts. This study is empirical in nature and is based on a review of the literature on how people perceive climate change at all scales, from local to global. For this purpose, systematic review method is used to analyse and discuss the electronic databases of literature search that was extracted by web based search engines. Among 232 literatures identified, 45 most relevant articles were selected for systematic review. The study indicates that the majority of people experienced and strongly perceived changes in climatic factors and events. Most of the local people perceived significant increase in climate change indicators in recent years and faced various level of impacts both local to global context. However, the climate change has affected on livelihood of the people living everywhere. As a result, it is crucial to focus on enhancing locals' capacity to cope to changing climate. The perceived knowledge and understanding of people on climate change can be helpful to cope with the potential risks and challenges of climate change in the future.

Keywords: People's perception, Climate change, Discourse, Local, Global

INTRODUCTION

Climate change is defined as a change in the climate's state that can be determined by changes in the mean and/or the variability of its properties and that continues for a considerable amount of time, usually decades or longer, according to Intergovernmental Panel on Climate Change (IPCC, 2007). It refers to any long-term change in the climate, regardless of whether it is the result of natural variability or human activity. Global warming is widely acknowledged to be a substantial, advancing hazard to humanity in the twenty-first century. Scientists have provided claims and tested models to promote this remarkably disconcerting fact (Chaudhary & Aryal, 2009). The statistics that are now available show that the air temperature near the earth's surface increased by 0.74 °C between 1906 and 2005, and experts predicted that it may rise by an average of 6.4 °C during the 21st century (IPCC, 2007).

Observations of regional and seasonal variation across the country show that regions and seasons with high precipitation are recording more precipitation and getting wetter. Even in areas with low rainfall, the seasons and regions are becoming drier and recording decreasing precipitation (GON, 2004). The increment in water-related disasters like landslides and floods is positively correlated with the altered monsoon rain intensity and amount (DWIDP, 2006). Gurung and Bhandari (2009) mentioned that the mid-hills of Nepal's water springs have just started to dry up. The geographic distribution of agro-ecological zones, habitats, and patterns of plant diseases and pests also change with changes in climate patterns, which can have a significant impact on agriculture and food production (FAO, 2007; Jianchu et al., 2007). According to FAO's 2005 forecast, up to 65 countries' ability to produce grain, which accounts for around 16 per cent of agriculture's GNP, would be negatively impacted by climate change, affecting 11 per cent of the world's arable land (GDP). The potentiality for producing food is expected to improve with an increase in local average temperature between a range of 1 and 3^0C, but above this it is forecast to decline (IPCC, 2007). As a result, the influence of climate change on agriculture is both positive and negative. Therefore, climate change issue is on frontline of global discourse.

The term "perceptions" has been used to refer to a variety of psychological constructs such as knowledge, beliefs, attitudes, concern, affect, and perceived risk. It uses a broad definition to encompass the different facets of people's internal representations of the issue, including cognitive (knowledge), affective (emotional), and evaluative (perceived risk) dimensions, but critically perceive how social processes and cultural context shape these understandings (Whitmarsh et al., 2011). Climate change perception refers collectively to climate change beliefs and concerns (Poortinga et al., 2019). Psychological constructs on climate change is complex process in discourse of climate change perception (Whitmarsh & Capstick, 2018). Climate change risk perception is described as the process of locating and evaluating climate change signals from a diverse range of sources in order to form a judgment about the possibility and

perceived severity of present or future damage caused by climate change (Bradley et al., 2020; Slovic, 2016).

Every person has a different perspective on environmental and natural issues. Adaptability and resilience are determined by social groups, geographic regions, seasons, length of exposure, and other factors. Although the perception does not match the measured reality, they are thought to represent the true changes (Nandanni & Watanabe, 2015). Adger (2003) mentioned that perception is closely tied to the degree of generated hazards and possibilities brought about by climate change that affects farmers' livelihoods, and those perceptions determine their adaptation techniques and responses. Moreover, the livelihood of farmers will unavoidably be impacted by climate change and its severe influence on agriculture. Concern over climate change among climate researchers is increasing and how farmers perceive it, which motivates them to search for scientific policy discourse.

Farmers can be able to alter their farming practices and protect themselves from potential risks and difficulties in the future with the help of perceived knowledge (Makate et al., 2017). Analysing current risks and their remedies as well as knowing the various levels of knowledge among communities or groups of individuals also aids in comprehending (Abid et al., 2015). Perception can therefore be viewed as a different type of knowledge obtained from personal experiences. In order to adapt to climate change and variability, perception is recognized as a necessary condition. As it affects the farmer's management of agricultural activities, it is one of the factors that can influence the decision of whether or not to adapt to climate change and unpredictability (Maddison, 2007). Understanding the phenomenon of changing climate locally is crucial for developing a response strategy, and perception-based research are essential in this regard (Jin et al., 2015). Therefore, peoples' perception on climate change is an important tool for social, political and economic actions to address climate induced risks.

According to Central Bureau of Statistics (CBS) (2006), 64 per cent of the country's cultivated area completely depends on monsoon rainfall; agriculture which accounts for nearly 96 per cent of all water use suffers greatly from unpredictable weather patterns like heat stress, extended dry seasons, and inconsistent rainfall. Reduced yield brought on by bad weather and environment will make people more vulnerable to famine, food insecurity, and lower life spans (Ebi et. al., 2007).

With regard to its relative vulnerability to earthquakes and climate change, Nepal is ranked fourth and eleventh globally, respectively (MoEnv, 2012). Over 80 per cent of Nepal's total population is vulnerable to natural disasters like floods, landslides, windstorms, hailstorms, fires, earthquakes, and glacial lake outburst floods (GLOFs) (Ministry of Home Affairs, 2018). About sixty five per cent population of Nepal are engaged in agriculture as a major occupation as well as main source of income (CBS, 2012). The economy of Nepal is largely dependent on agriculture and is highly sensitive to climate change. People's livelihoods are at risk from the impacts of climate change, however, due to a lack of resources and knowledge. Therefore, in least developed

countries like Nepal, climate change is viewed as one of the major obstacles to people's livelihood, agriculture, and economy.

Furthermore, Nepal has a variety of geophysical and meteorological variables in comparatively small areas as well as economically poor in one hand. On the other hand, systematic risks induced by climate change are prominent, threats facing humanity. In this regard, the issue of the paper is pertinent to research how climate change is affecting the social and economic worlds. Therefore, the study would advance our existing knowledge of the magnitude and effects of environmental changes. Studies on knowledge and perception of local people at community levels, the lessons learned and research implications might offer ideas and techniques for evaluating local people's views on climate change. In this backdrop, the perception of people on climate change is a growing area of study in the social sciences and one that has implications on the tools and strategies as well as use to communicate climate change risk information. That is why, this paper tries to discuss and analyse about local people's perception on climate change by reviewing past studies. The review presented in this paper highlights some crucial issues for future research and policymaking that can serve as a foundation for meaningful discussions of the issue in general and, it can make a significant contribution to the policy discourse by providing recommendations based on robust evidence in particular.

METHODS AND MATERIALS

The study is based on the review of literature on people's perception of climate change from local to global scale based on past studies. For this purpose, the study is based on the application of systematic search procedures. The paper is basically used to analyse and discuss the secondary data retrieved from the different electronic databases to review the existing evidence based literatures. This paper has reviewed empirical literatures for the analysis.

The choice of electronic databases is based on the relevance and appropriateness of the topic area. To ensure the appropriateness and relevancy of electronic database, the search literatures were evaluated and selected on the basis of coverage, focus, methods and results of each databases in particular topic and field of study. The information for empirical review was extracted from multiple but reliable online search engines. The search engine of electronic databases such as Google scholar, TUCL ProQuest, Scopus, Elsevier, sage, Emerald Insights, Springer, Web of science, Willey, JSTOR, Science Direct, SciELO, Directory of Open Access Journal (DOAJ) were used to access and retrieved the data and information for the review of existing research based documents.

The systematic review approach has been employed for this study. To retrieve the relevant articles from the databases as per the objective of this study, well-constructed keywords or phrases were formulated. For this systematic searches, the following key words were used: 'climate', "climate change", 'global warming', 'global climate change', 'local climate change', 'people's perception', "people's perception and climate change" "local perceptions and climate change" To make the review document more reliable and valid, the inclusion and exclusion criteria was applied for selection of the literatures in this paper. The

inclusion criteria of literature selection were based on ISBN number of books, ISSN number of peer reviewed journal articles with DOI number, institutional policy reports and research papers, academic dissertations, both in a local and global context.

In total, 232 research based articles were identified. Out of total (232), 45 articles were selected for the study on the basis of inclusion-exclusion criteria. All selected articles (45) were managed by Mendeley Reference management software. An exhaustive but selective methodology was used to choose the pertinent literatures. The limited literatures were used from Tribhuvan University Central Library (TUCL) and research based institutions as well as limited use of advance search strategy to extract electronic database from search engines. An explicit descriptive summary of all the extracted records was prepared for the synthesis of the results.

RESULTS AND DISCUSSION

Perception is closely related to the degree of induced risks and opportunities triggered by climate change that affect farmers' livelihoods, and those perceptions determine their adaptation strategies and responses (Adger, 2003). Every individual may have perceived differently on environmental and natural factors. It depends on the social groups, geographical locations, and seasons, length of exposure, resilience and adaptive capacity. Though the perception is non-consistent with the measured reality, they are considered to reflect the real changes (Nandanni & Watanabe, 2015). By reviewing pertinent earlier studies carried out at both a national and global scale, this paper has discussed below how people perceive climate change.

a. People's perception on climate change in national context

The study conducted by Piya et al. (2012), perception on climate change in rural mid-hills of Nepal showed that majority of respondents (23.5%) believe that rainfall is unpredictable in terms of quantity, while the majority of respondents (36.7%) believe that total rainfall has decreased (sometimes high, sometimes low). The actual trend in rainfall is consistent with how the community perceives it, with the majority belief that rainfall is unpredictable and rapidly decreasing. Among the four study sites, most respondents from Gorkha (62.3%) were perceive the decreasing rainfall in line with historical data, while one-fifth respondents from Chitwan (20.7%) had perceive the decreasing rainfall. Similarly, Adhikari et al. (2018) mentioned that More than 92 per cent of respondents said that they had perceived the problems of climate change, including low or unusual rainfall, the rate of land drying out, the dryness of wetlands, changing crop production, and ecosystem processes.

Alternatively, the highest percentage of people in Chitawan (43.1%) and the lowest percentage in Gorkha (13.2%) perceived that rainfall is unpredictable and varies from year to year. Many respondents felt that the rainfall pattern was unpredictable, most likely as a result of the significant inter-annual variations in rainfall. It is challenging to draw a generalization about the rainfall patterns because the rainfall pattern for all of Nepal exhibits the same pattern of notable variations (Practical Action, 2009).

However, the majority of the household (76%) stated that they perceived the effects of climate change, while 11 per cent perceived no effects and 13 per cent were unknown about it (Neupane et al., 2019). Similar impacts were noted in a study conducted by Dahal in the Nepalese Himalayas in 2005. Due to the unpredictable monsoon, most of people perceived negative effects like the destruction of mud walls and roofs as well as an increase in pests and diseases in crops.

On the other hand, no positive perceptions regarding the impacts of extreme events caused by climatic change were found in a study carried out in the lowlands of Nepal's Kailali district. The main effects noted were an increase in pests and diseases in livestock and crops, a change in cropping patterns, declining productivity, a reduction in grazing lands, and infrastructure destruction as a result of more frequent flooding (Maharjan et al., 2011). In Kaski district, only 3 per cent of respondents noticed predictable and consistent rainfall patterns, while 97 per cent of respondents said that the past ten years' rainfall patterns had been unpredictable. Nearly 72 per cent of respondents claimed that drought incidents have been rising and connected with rainfall patterns. Over the past few years the untimely and unusual rainfall patterns is increasing (Bhusal, 2009). According to Bhusal (2009), the past experiences of the local inhabitants revealed the negative impacts of increasing temperatures, unpredictable rainfall patterns, ecological variability, and biological change has been noticed. However, they adversely impacted on human beings.

More than 50 per cent of respondents reported that there is an increase in warming days, unpredictable rainfall patterns, changing seasons, an increase in drought incidents, abnormal hail storms, warmer wind patterns, dwindling water sources, stronger wind storms, and a decline in native plants. According to the result conducted by Tiwari et al. (2010), More than 80 per cent of households responded that they had noticed an increase in temperature over the previous five years, as well as low snowfall in the High Mountains and rainfall in the Mid Mountains and Terai region. Khanal et al. (2019) found that significant impacts of climate change and variability have been felt by the Chepang community. They identified weather-related disasters, crop diseases, insect infestations, and human health problems as effects of climate change.

However, the study conducted in Rupandehi district by (Dahal et al., 2015), the study showed that more than half of the respondents were familiar with the concepts of climate change, while the other half did not. The findings of this research revealed that the study area is affected by climate change in a number of ways, including decreased agricultural output, loss of biodiversity, decreased water resources, and increased health risks. Adhikari et al. (2021) reported in the recent research that the majority of respondents (85%) thought that summer temperatures were rising, while 15 per cent said that there was no change in summer temperatures. Similarly, about 33 per cent of respondents said that the temperature remained unchanged, while 15 per cent said that the winter temperature has been falling over the years. Of the respondents, 53 per cent thought that the winter temperature was also rising.

The trend assessment of temperature and precipitation over the long and

short terms provides key messages at local level. The above review reflects some insights and discourse on people's perception on climate change as the trends for winter temperature and annual rainfall clearly show how the direction of trends can differ for the two time periods. The review raises second discourse, as shown in the case of rainfall, local perceptions usually follow short-term trends rather than long-term ones.

b. People's perception on climate change in global context

According to a global survey conducted in 2019, public concerns about recent climate change are growing, and the majority of respondents thought that it posed a serious threat to the entire world (Fagan & Huang, 2019). Maddison (2007) has conducted in 11 African countries at a large scale survey, reveals that large number of farmers noticed an increase in temperature and a decrease in precipitation. Years of farming experience was the major factor to notice the climate change and poverty was the major barrier towards the adaptation. The same trend in the decrease in precipitation in Southern Ethiopia can be seen which was similar with the data recorded in nearby meteorological stations (Gebre et al., 2013). Farmers' perceptions of the rising temperatures and wide variations in rainfall patterns, which are consistent with meteorological data, are revealed by a farm household survey in South Africa's Limpopo River Basin. Lack of access to credit was considered as a barrier to inhabit the adaptations (Gbetibouo, 2009). The study carried out in eastern Saloum of Senegal shows the excess rainfall and wind as the most destructive climatic factors which have reduced the crop yield and led to poor livestock health (Mertz et al., 2009). Household survey conducted in seven districts in Kenyashows farmers perception on the increase in temperature and rainfall and are adapting by changing the planting decisions but lack of access to extension services and improved seeds are the major barrier for them (Bryan et al., 2013). However, the survey conducted in Canadian farmers shows a good access to technology and management tools and have adapted finely towards climatic changes (Bradshaw et al., 2004).

According to a study done in the Northern China Plain, the average annual temperature has significantly increased while the average annual precipitation has not changed, which has resulted in a water shortage, rising food grain demand, and high farming input costs. Farmers have adapted to the change by changing plantation dates and water saving irrigation systems (Zhang, et al., 2015). According to a study done in the Kullu Valley of India's Western Himalayas, farmers noticed there a decline in snowfall, an increase in temperature, and no change in precipitation. Their perception seems to be influenced by crop-climate interaction and productivity (Vedwan & Rhoades, 2001). In the Punjab Province of Pakistan, data on farm households were gathered from three districts in three archaeological zones, demonstrating how farmers are adjusting by modifying planting dates, crop varieties, fertilizers, and tree planting. Farmers have also perceived the lack of budget, information and resources as a constraint for adaptation (Abid et al., 2015).

Bauer et al. (2022) mentioned in his empirical study that the most frequently noted changes were those in temperature, which were mentioned by 38

respondents (77.5%), followed by seasonality changes (26 households, 53%), rainfall changes (26, 53%), and wind changes (8, 16%). According to the findings, households engaged in subsistence farming reported that the majority of the adverse consequences of the extreme weather event affected their natural capital.

Singh et al. (2022) found that the majority of farmers thought that there was more uncertainty regarding the arrival and departure of the monsoon due to variations in the rainfall distribution. Due to the prevalence of intra-seasonal dry spells or drought-like conditions in the area, roughly 44 per cent of the farmers exhibited water stress. The ecological systems that support the livelihoods of individuals who rely largely on natural resources are being severely impacted by climatic aberrations and extremes.

However, more than 90 per cent of the sample, especially when it came to the average summer temperature, perceived the temperature to be rising, according to Ricart et al. (2022). In terms of increased frequency and severity, farmers ranked drought risk higher than flood risk, with significant internal consistency across the samples (90% vs. 70%, respectively). In 22 European countries and Israel, a study was conducted on people's perceptions of climate change and their determinants. The evidences showed and supported the fact that the results differ significantly between the participating countries. In all participating nations, the perceived effects of climate change were viewed as generally negative and ranged from -1.07 in Israel to -2.55 in Portugal, suggesting that the majority of people believe that Europe's (and Israel's) exposure to climate change will only have moderately adverse effects (Poortinga, et al., 2019).

Perception of farmers on the change in climatic conditions is different from place to place and the scientific data or studies also show the same result. Even the perception and climatic condition may vary from community to community. However, most of the study is conducted in a broader perspective and larger geographical area. So, these results cannot be generalized to the small communities that can have the different perception and adaptation approaches towards climate change.

CONCLUSION

The study results show that most of the people perceive the changes in the climate and extreme events on significant scale. The observed metrological data also support people's perception on climate change. Therefore, the study concludes that most of the studies have provided an important opportunity to advance the understanding of how local people and communities perceive climate change, and how their perceptions in turn shape their mitigation action on climate change. Perception of local people on the change in climatic conditions is different from place to place and the scientific data or studies also show the same results. Even the perception and climatic condition significantly vary from community to community. It is clear that the livelihood of people has been impacted by the climate change everywhere. Therefore, the development of human capacity to adapt to climate change is urgently needed. The policy

makers, planners and development agencies should develop area focused research and development strategies to cope climate change impacts.

Research Implications

On the basis of above discussion and conclusion, it reflects as a research implication that the perceived knowledge on climate change can help the people to change the livelihoods and wellbeing of people and safeguard to the probable risks and challenges of climate change in the future. It has great significant for the perceptions of local people regarding climate change, its effects, and the adaptation techniques used to increase their adaptability to changing climates. That is why, perception based studies play a vital role in understanding the phenomenon of climate change at grassroots level which are important in devising a strategy to respond to it by formulating specific policy and programs properly. The intention and effectiveness of adaptation rely greatly on how people perceive climate change. People's perceptions might not always be precise and timely, or logically in line with the significance and direction of observational records. Although the majority of the studies have matched perception of farmers and climatic data, there has been less focus on comprehensively analysing both data sets' inconsistencies based on the findings of empirical studies.

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