Factors Affecting Climate Change Risk Perception and Policy Support for Mitigation Measures: A Case of Nepal

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FORWARD

This thesis is written in an article form (which is presented in the fifth chapter) targeting broader audience and will be send for publishing on the journal 'environment and Behavior' (Sage Publication), after the thesis defended. Chapters other than article are provided for the supporting information that considered necessary to evaluate the work but could not mentioned in article. So, readers are requested to follow the section 1.4 (Structure of the thesis) for detailed overview about organization of this thesis work before getting started.

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ABSTRACT

Environmental psychology can made significant contribution in understanding climate-risk mitigation behaviors for reducing its adverse impacts, especially in a country highly vulnerable to climate change like Nepal. Individual level analysis to explore what motivate people to support mitigation policies is important for policy consideration. In this study, public perceptions of risk of climate change is assessed and its impacts on public support for risk-mitigation policies in Nepal is examined along with other influential factors like knowledge, trust, experiences and perceived risk of climate-related hazards –flooding and landslides. Data was collected during April-June, 2012 (n =356) using survey questionnaire among university/college students from Kathmandu Valley. Finding suggests that people who supported mitigations policies perceived higher risk of climate change, showed greater causal knowledge, imposed higher trust on the leadership of environmentalists and academician, and acknowledged landslides as posing higher risk. Participants were unable to connect climate-risk with the risk of flooding. Additionally, public supports for most effective and costly policies: carbon-focused and engineering alternatives (than general green policies) are better predicted by perceived risk of climate change, causal knowledge and trust. Finally, the thesis is concluded as assessing and acknowledging the public images of climate change is crucial for higher public support and involvement in the risk mitigation measures which would ultimately lead to success of any attempts for increasing people's behavioral responses to mitigate the adverse impacts of climate change in Nepal.

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APA	American Psychological Association
CBS	Central Bureau of Statistics
CCMD	Climate Change Management Division
CCNN	Climate Change Network Nepal
CCPN	Climate Change Policy Nepal
CCPR	Climate Change Policy Report
CCRP	Climate Change Risk Perception
CEPoL	Carbon-Focused and Geo-Engineering Policies
DFID	Department for International Development
FE	Flooding Experiences
FRP	Flooding Risk Perception
GGPoL	General Green Policies
GHG	Green House Gas
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KV	Kathmandu Valley
LE	Landslides Experiences
LRP	Landslides Risk Perception
MoE	Ministry of Environment
MOPE	Ministry of Population and Environment
NEP	New Environmental Paradigm
RIPENSA	Risk Psychology, Environment and Safety
ST	Social Trust
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. INTRODUCTION

Climate change refers to a significant and long term change in earth's natural climate system such as temperature, weather pattern, precipitation, wind etc., due to natural process or human activities (IPCC, 2001). The term "climate change" is used in this thesis stands on the definition of UNFCCC (1992) which defined it as a change in the climate system "……resulting from direct and indirect human activities, over and above natural variation".

Scientific evidences for the negative consequences of climate change are noticed all around the globe and a need for immediate action to minimize the adverse impact of climate change is recognized in the United Nations Framework Convention on Climate Change in 1992. However, these negative impacts are not uniform across globe and their severity is likely to be high among those countries which have limited resources for risk mitigation, higher climatic variation and poorer communities (UNFCCC, 2001) like Nepal.

1.1. Background of the Study

In recent days, environmental psychology has made important contribution in explaining climate change-related behaviors (voting and supporting for climate lobbyist, adopting environment-friendly technologies, human consumptions and adopting actions) and the ways these behaviors can affect human well-being and its' natural environment. Since, these climate-related behaviors are complex (Swim, et al., 2009, Klöckner, 2011). Knowledge about the complete framework of psychological processes involved in people's climate-related behaviors can offer strategies to combat its adverse impacts successfully. For instance, the psychological process behind individual's behavioral intentions towards a certain climate policy is influenced by his/her understanding, personal experiences, emotions and perceptions related to climate change, his/her attitudes and values towards the phenomenon, and socio-political, geographical and cultural context behind him/her (Swim, et al., 2009). A deeper understanding of how these dimensions influences human behaviors can undoubtedly offer

answers for why it is that way. However, a single universal approach for mitigating the threat of climate change does not exist and a successful mitigation approach should acknowledge the local knowledge on public's understandings, experiences and perceptions of climate change (Klöckner, 2011). The social-cultural context by which human behaviors are determined to a large extent, is also important for climate related-behavior for identifying how the attitudes, values, and beliefs of an individual within a particular society affect the choice of his/her behavior (Swim, et al., 2009). The study area selected for this research, Nepal, has some unique features in above mentioned context (each context or behavior setting, in terms of Environmental Psychology, has unique combinations of features that hinder or promote selected behavior). Nepal's slow movement in the field of climate change mitigation practices has drawn attentions for understanding and evaluating on what Nepalese people know about climate change, how they perceive it and what motivate them to behave (or not) in response to this phenomenon.

1.2. Research Problems

Existing climate change literature suggest that public intentions to perform climate-risk mitigating behaviors are determined by perceived risk of the phenomenon, knowledge about the subject, attitude toward environment (O'Connor, Bord and Fisher, 1998, 1999; Leiserowitz, 2006), human values (Schwartz, 1996; Nilsson, Borgdete and Biel, 2004), personal experiences and perceptions of climate-related hazards (Lin, Shaw and Ho, 2008), and public trust in various institutions or agencies working in this field (Dietz, Dan and Shwom, 2007).

My thesis explicitly deals with the direct and indirect influences of public's correct understanding of the causes of climate change, human values and environmental beliefs, individual's direct experiences and perceived risks of climate change-related hazards

(flooding and landslides), and social trust on the level of support for the climate-risk mitigation policies among Nepalese people

1.3. Significance of the Study

The objective of the study especially focused on a psychological approach to explain public support for climate change mitigation policies of Nepal. Public perception of the issue has been found important in the field of active and initiative public participation in climate-risk mitigation measures (Swim, et al., 2009). My study explores the key factors influencing public perceptions of climate-risk among Nepalese people that will help to understand the public's preferences for different climate-risk mitigation policies. This is important for policy makers for successful formulation, and implementation mitigation practices. Furthermore, local impacts and experiences of global climate change process are important for public perception of the issue (e.g., Whitmarsh, 2008; Lin, et al., 2008) and behavioral intentions regarding mitigation measures (e.g., Spence, Poortinga, Butler and Pidgeon, 2011). The results of my study adds some insight and information on the existing literature about how these local impacts and experiences can be translated into a greater willingness to mitigate climate change.

Human environmental behaviors have shown to be also influenced by basic values (Schwartz, 1996; Stern, Dietz, Abel, Gaugnano and Kalof, 1999) (which is rarely investigated with respect to climate change-related mitigation behaviors) and environmental beliefs (Dunlap and Van Liere, 1978). Therefore, this study aims to analyze the role of basic values (Schwartz's values) in explaining climate change mitigation behaviors. It is also assumed that assessing the public's environmental orientations help understand the differences in public preferences over various mitigation policies to some extent (e.g., Leiserowitz, 2006, Bord, et al., 2012)

In addition, public trust in social institution/agencies is crucial for risk regulation and risk decision making (Slovic, 1993; Poortinga and Pidgeon, 2003). Assessing the level of public trust over institutions/agencies working in the field of climate-related risk mitigation in Nepal is important in the sense that how much they trusted by the public for their efforts. Public trust can be utilized for achieving higher public participations and desirable climate change-mitigation behaviors and this is also supposed to be helpful in eliciting a deeper insight on what strategy will be accepted to a higher extent for a certain mitigation approach.

Overall, assessing the current state of knowledge about above-mentioned psychological processes through data collection will fulfill the policy practice gaps by feeding existing government policies with cutting-edge research findings. Furthermore, the study will also identify the gaps those can be addressed through long-term research and educational efforts.

1.4. Structure of the Thesis

The thesis is organized into 7 chapters. The first chapter includes a general introduction, background of the study, the research problems and significance of the study. The second chapter provides detailed information about the geographical, socio-political context, and climate change trends and impacts in Nepal. In addition, various efforts on adaptation and mitigation perspectives of climate change in Nepal are also presented.

Third chapter focuses on the theoretical perspectives of basic risk perception and its determination of behavioral outcomes. This chapter also includes the theoretical backgrounds on the factors influencing climate change risk perception and policy support.

Fourth chapter focuses on research design, sample and procedure, data collection and analytical strategies.

A scientific article is presented in the fifth chapter which is the core of the thesis work (chapters other than the article are presented as an additional part of the thesis). The first three parts of the thesis include supporting information on the context and background of the study that are considered necessary to evaluate the work but could not mentioned in the article which targets a broader audience. The article is written targeting the journal "Environment and Behavior", Sage Publications, for publication and will be sent in after the thesis is defended. In the article a model derived from theory is proposed for empirical testing by means of a path analysis. Descriptive statistics for the model variables and the result of the model test are presented. Results are evaluated and interpreted with respects to the hypotheses in the discussion sections. Subsequently, the practical consequences of results and their implications are discussed along with their limitations. The article has a separate abstract, reference lists and appendix from the rest of the thesis.

Furthermore, human values and environmental beliefs were also considered to be important factors affecting public perception of climate change and policy supports, and hence were included in the model at earlier stages of analysis but their scale structure and reliability could not be achieved. Therefore, these are not included in the model test. But related the theoretical background, scale constructions, and possible reasons for their unsatisfactory structure and reliability are discussed in the third and fourth chapter respectively.

In chapter six, additional results which seem to be important but could not be presented in the article are presented and are evaluated and interpreted with practical implications in the chapter seven.

Some of the information and ideas are presented both in the article and the additional chapters to make aid the reader and keep the flow of writing, and some references are listed in both the article and the manuscript reference list if they cited in both.

2. DESCRIPTION OF THE STUDY AREA

I have conducted the study in Nepal, a south Asian Himalayan country, represented by a wide geographical variations and rich cultural diversity. However, the country is poorly developed regarding access to education, technology, health care system and climate-risk reduction technology. The increasing trend of climate change impacts in Nepal and efforts for risk adaptation/reduction are presented in the following sub-section along with the importance of risk mitigation measures.

2.1. Geographical and Socio-Political Context of Nepal

The total land area of Nepal is 147181 square kilometers with average East-West length of 885km and North-South width of 193km. the country extends between $26^0$22' North to $30^0$27' North latitude and $80^0$4' East to $88^0$12' East longitude with elevations range from 66 meters in the south to 8848 meters in the north (MOPE, 2004). Nepal is divided into three distinct ecological zone: Tarai, Mountain (also referred as Hill), and Himalayan region. Tarai is a low-lying plain area, highly vulnerable to floods during the rainy season. Due to sloping and fragile landscape, Mountain and Himalayan region are highly vulnerable to landslides (Regmi and Adhikari, 2007).

The preliminary results of the population census (2011) shows that the total population of Nepal is 26.62 million, of which 51.44% are male and 48.56% are female. Around 50% of the population is living in Tarai region which constitutes 23% of total land area (CBS, 2011b).

Nepal has diverse cultural background: 103 ethnic/caste groups with their own languages are listed in the population census of Nepal (2011). Majority of the people are Hindus followed by Buddhists, Muslims, Kirants and Christians. Nepal living standard survey (2010-2011) reported that 56.6% of adult population is literate, among them percentage of male is 71.6 and that of female is 28.4 (CBS, 2011a).

2.2. Climate Change Impact and Trend in Nepal

In Nepal, the remarkable differences in climatic conditions from tropical to alpine are primarily related to complex physiographic and wide ranges of elevations within short distance between north and south. The temperature in the southern Tarai region reaches above 45 degree Celsius in the summer season and northern Himalayan region is mostly covered by snow during the whole year. The increase in average annual temperature in Nepal was recorded 0.06 degree Celsius between 1977- 1994. Mountain and Himalayan regions are experiencing higher rates of warming than Tarai region, and warming is more pronounced in summer season than winter (Shrestha, Wake, Mayewki and Dibb, 1999). Similarly, the annual mean rainfall is around 1800mm but the distribution across the season and geographical region is not uniform. In summer season, 80% of the total precipitation occurs and this is abundant in Tarai region, South-Eastern part of Nepal, and lower mountain region than the other parts of the country. Faster rate of glacial melt/retreat is causing increase in river- flow at 1.48 m3/s per year in the summer season, which is 1.5 times higher than increased precipitation (Dahal, 2006; as cited in Regmi and Adhikari, 2008).

Nepal's National Communication Report to IPCC (2007) identified that water resources, agricultural sectors, forest and biodiversity and health sectors are primarily vulnerable to climate change impact in Nepal(cited in Regmi and Adhikari, 2007), and poorer ethnic communities especially from the remote areas are most likely to suffer from climate change (UNFCCC, 2001). The impact and severity of climate change would be increasing at global level and Nepal will not be the exception for that. Symptoms are already appearing to begin. In the recent years in Nepal, climate-related events like Glacial Lake Outburst Floods (GLOFs/ flash floods), landslides, excessive precipitation, flooding and prolonged drought are frequent in Nepal (Regmi and Adhikari, 2007).

The result of MAGICC/SCENGEN analysis (a climate change projection method; Houghton et al., 2001) of Nepal shows that the temperature will increase 1.2^{o}C by the year 2030, 1.7^{o}C by 2050 and 3^{o}C by 2100. Similarly, the percentage of increased precipitation is projected as 5, 7.3, and 12.6 by the year 2030, 2050, and 2100 respectively (Agrawala, et al., 2003). These researches argue that there is high level of confidence on increasing trend of climate change to continue in future and more importantly, are pretty much confident in that intensified summer monsoon will increase the risk of flooding and landslides in Nepal.

The contribution of Nepal in world carbon emission is still very low which is 0.025% (Regmi and Adhikari, 2007) but the amount produced is embedded with country's economic and technological development, population size, and resource consumptions. There is continuous increase in GHG emission with increasing values of GDP per capita in developing countries (Schmalensee, Stoker and Judson, 1998). It is hard to find data on the projection about Nepal's contribution on GHG emission, however, there is high level of certainty on that Nepal's contribution on GHG emission will increase in future due to increased per capita energy consumptions, infrastructure development, natural resource consumption, deforestation and gross increase in agricultural activities to feed increased population (Lohani and Baral, 2011).

2.3. Climate Change Adaptation and Mitigation Perspectives in Nepal

Climate change adaptation and risk reduction programs in Nepal are running in coordination between government and various non-government organizations like, IUCN, WWF, UNDP, EU, JICA, DFID etc. These organizations are primarily focuses on educational campaigning, health and sanitation, climate induced disaster risk reduction, sustainable development and biodiversity conservation, agriculture and food security, and low carbon economy (Climate Change Network Nepal, 2011; Climate Change Policy Nepal, 2011). The prime focus on these climate change adaptation strategies in Nepal are justified by its low level of

contribution in world's CO_2 emissions and the over-proportional impact it is getting. However, climate change mitigation measures cannot be neglected because of the increasing potential for GHG emissions of Nepal in future.

Annual population growth rate of Nepal is 1.35% (CBS, 2011b) and there is significant increase in commercial energy consumption, especially in the sector of household, industrial, transport and agriculture. About 64 % of the total population depends on firewood for cooking and 87% of domestic energy is supplied from forest (Pokharel, 2007). Deforestation is also accelerated by increasing demand of agricultural land and livestock grazing. These factors contributing higher GHG emissions are vital and can be addressed in a sustainable way through climate mitigation policies (Swim, et al., 2009). The demand for immediate mitigation measures into action to reduce the GHG emission below current level has been already stressed as a major agenda of UNFCCC (1992). Furthermore, IPCC fourth assessment report (2007) identifies that there are also co-benefits of climate change mitigation: many climate change mitigation measures lead to decrease in air pollution, resulting health benefits that might compensate the higher pro-environmental energy costs. Similarly, Mitigation can also be positive for energy security, improving the balance of trade, providing rural areas with modern energy services and sustainable agriculture and employment (Rice, 2007; as cited in IPCC, 2007).

Fourth assessment reports of IPCC (2007) mainly emphasized mitigation measures related to the use and development of pro-environmental technologies, increasing carbon prizes and change in life style for GHG reduction. Psychological knowledge can contribute for better outcomes in each mitigating sector where it comes to the changing human behavior in individual as well as collective level like, increasing public favor for mitigation measures, developing sustainable energy use behavior, travel mode choice, making eco-friendly life-style, responding to higher carbon prize (Swim, et al., 2009).

3. THEORETICAL PERSPECTIVES

The basic assumption of the present study is that human behaviors regarding threatening events/phenomena are related to the perceived level of risk of those events/phenomena: people perceiving higher level of risk are likely to show stronger intentions to act in a way that tends to minimize the negative outcomes of the situation. Therefore, at the first explanatory value of some basic risk perception theories in terms of behavioral intention/outcomes and theoretical approaches for explaining and changing the environmental behaviors are presented at first. In the next step, theories relevant for factors influencing public's risk perception of climate change and policy supports are critically analyzed.

3.1. Explaining Risk Perception

A common thing in definitions of risk perception in the psychological literature is that it is a cognitive decision making process where people make probabilistic judgment about likelihood of events and the amount of negative outcomes connected to them (see Sjöberg, 2000; Oltedal, Moen, Klepme and Rundmo, 2004 for detail discussion). Several factors are affecting risk perception but the existence of real risk is a must. However, person's own estimation of risk is not always same as the technical estimation of risk. Perceived risk for a person is his/her thoughts, beliefs and constructs about the risk object (Sjöberg, 1979), whereas, objective risk has nothing to do with the knowledge and worries about the source of risk (Ulleberg and Rundmo, 1996). Sometimes, a realistic estimation of perceived risk can be achieved if the risk source is well-known and with which people have some experiences (Sjöberg, 1995, 2000).

Cognitive approach offers the explanation for deviations in subjective judgment of the probability of risk from the objective one. Among three heuristics- representativeness, availability and anchoring, mainly availability heuristic was argued to be the most important for understanding risk perception (Tversky and kahnemann, 1973). This approach has a

limited importance because subjective probability is just one of the many other dimensions that influence risk perception. A well-researched psychological theory of risk perception, introduced by Fischhoff and his colleagues (1978) called psychometric paradigm, is a major attempt to explain the deviations of perceived risk from objective risk.

Many risk characteristics (about to 9 to 18), that influences person's subjective judgments about risk were suggested in earlier studies about psychometric paradigm (Fischhoff, et al., 1978) but only three risk characteristics: new-old, dread and number of exposed are repeatedly found important (Sjöberg, 2000b). People are likely to judge higher risk of novel, unknown, and unfamiliar risk than that of familiar one. Similarly, the potential of dreadful outcomes of an event is perceived as riskier (people also tend to judge an event having higher risk even if the probability of such dreadful is very low in existence) if it is catastrophic in nature: can affect large number of people at once. According to Sjöberg (1996), Psychometric paradigm conceptualize the perceived risk as a function of the general properties of the risk objects, but it has also a cognitive stance with focus upon perception as a cognitive process. He added the fourth factor in psychometric paradigm, denoted as unnatural and immoral risk, related to tampering with nature and violating moral principles and found substantial increase in total explained variance. Furthermore Sjöberg (2000b) found that risk perceptions of nuclear related hazards are influenced by peoples' attitudes towards risk objects (i.e. people having positive attitude towards nuclear power also perceive less risky), general risk sensitivity of person (i.e., some people perceive higher risk than others irrespective of the risk objects), and a specific sensitivity towards certain risk (e.g., nuclear risk is associated with the specific fear of radiation)

Another important phenomenon in the risk perception is unrealistic optimism, where people overestimate the risk for others than themselves (Sjöberg, 2000b). Unrealistic optimism is profound in the perception of negative consequences, especially in those risky events, which

people perceive some control over it (e.g., consuming alcohol, smoking etc). A weaker unrealistic optimism was found among people experiences road accident or suffered loss due to other negative events (Dolinski, Gromski and Zawisza, 1987) but the effect of experiences reinstates quickly (Burger and Palmer, 1992). Cultural differences have been reported for this illusion of invulnerability. Interdependent culture (for e.g., Japan) displays less cognitive and motivational tendencies to maintain positive illusions than the independent culture (for e.g., Canada) (Heine and Lehman, 1995). Hence, the individual differences in the level of risk perception across culture can also be explained by cultural adherence and social learning (Boholm, 1996).

The second major attempt to explain the risk perception is through Cultural theory (Douglas and Wildavsky, 1982) which provides, according to Sjöberg (2000b, p.5), a "non-proximal or distal explanations of risk (i.e. in constructs that are contentwise less obviously related)". According to Douglas's cultural theory, four types of peoples or worldviews, namely: Egalitarian, individualists, Hierarchists and Fatalist, differ in the concern about different risk sources. The result of grid-group interaction is the formation of four distinct social environments where these four types of people or worldviews exist (see, Douglas and Wildavsky, 1982 for detail on grid-group typology). These four types of people have their own way of preserving life and, hence perceive the risk that endanger their own way of life as risky and act accordingly (Oltedal, et al., 2004). Furthermore, humans are active organizer of their own perceptions, they choose what to fear and how much to fear it (Dake, 1991). Social aspects and cultural adherence serves as guidelines for this organization of perceptions. This classification can serves as an instrument to compare the morphology of the societies, irrespective of their existence in time and space (Boholm, 1996). Wildavsky and Dake in 1990 found that risk perception is best predicted by four types of worldviews (other predictors were personality, economy, knowledge, political attitudes, and level of knowledge). However,

in later studies (e.g., Marris, Langford and O'Riordan, 1998; Sjöberg, 1997), the predictive power of cultural theory could not be achieved.

Literatures on risk perception have demonstrated that demands for risk mitigations and risk reductions are more likely to be influenced by expected severity of consequences than the probability of harm (however, risk perception is more influenced by probability of harm) (Sjöberg, 1999). Furthermore, Sjöberg (2000) demonstrated that policy related attitudes and people's general sensitivity towards risk objects (for e.g. nuclear risks) are important for policy considerations. The various factors associated with the perceived risk of climate change and their influences on mitigation preferences will be presented later in the article section.

3.2. Factors Affecting the Support for Climate Change Policy Measures

In the following sections various literatures about the factors predicting more specifically the public support for climate change risk mitigation policies are presented.

3.2.1. Climate change risk perception, experiences and risk perceptions of climate related hazards (flooding and landslides), knowledge, and trust

(Presented in chapter 4: introductory part of the article)

3.2.2. Basic values

Basic values are determinants of individual's interests, pleasures, likes, preferences and criteria of moral standards, desires, wants, goals, needs, aversions and attitudes (Williams, 1979). Values are stable desirables that serve as a guiding principle for individual's actions, judgments, attitude and arguments (Rokeach, 1973, Schwartz, 1996). According to Schwartz (1996) a total of ten types of human values exist across cultures: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. Individual's value preferences are different in different society. Actions taken to pursuit these values could be more stable because these "……values have cultural content,

represent a psychological investment and shaped by the constraints and opportunities of a social system and of a biophysical environments" (Williams, 1979 p.21).

The potential for value conflict in relation to climate change mitigation has not been widely discussed in the literature of climate change. Values can serve as standard or criteria for selection or evaluations of actions, policies, people, and events (Schwartz, 1992, 2009). In case of climate change, values may provide important insight in the individual's judgments on perceived risk of climate change, preferences of mitigations options, and feeling of moral obligations to act in favor of society both for present and future generations. For instance, people with high universalism value may show more concern for GHG emissions than the people who values power and achievement at higher level.

Schwartz (1996) emphasized the dynamic, competing, and conflicting nature of values and suggested to treat them as an integrated whole system in their relations with behavior instead of single value approach. He further argued that a single value is not sufficient to elicit a desired behavior; instead a combination of similar values gives a more reliable index of value priorities. His theory of an integrated value system places ten types of motivational values on two dimensions (viz. openness to change vs. conservation and self-enhancement vs. self-transcendence). According to this theory self-direction and stimulation values favor openness to change; while security, conformity and tradition values favor submissive self-restriction, preservation of traditional practices and protection of stability. Similarly, universalism and benevolence values favor higher concern for others welfare whereas power and achievement values reflect one's own success and dominance. Hedonism shares elements of both openness and self-enhancement (Schwartz, 2009). People having higher value priorities for universalism, benevolence, self-direction and stimulation are likely to show higher favor for climate change mitigation behavior due to their higher concern and favor for the well-being of others in the society (O'Brien, 2009; Nilsson, Borgstede and Biel, 2004).

3.2.3. Environmental beliefs

Individual differences regarding environmental behaviors are reflected by people's personal and socially shared experiences with respect to natural environment, their values and belief systems, and past experiences (Kaplan and Kaplan, 1989). An individual's intention to perform pro-environmental behavior depend on her/his environmental orientations, synonymously also referred as environmental beliefs. Since, conceptualizing environmental beliefs is a complex task because these beliefs are clustered into several different perspectives (e.g., altruistic, egoistic, Biospheric) (Stern, Dietz and Kalof, 1993). A widely used approach to measure people's general environmental beliefs was first developed by Dunlop and Van Liere in 1978 and referred to as the new ecological paradigm scale; since revised later by Dunlop, Van Liere, Mertig and Jones in 2000 as new environmental paradigm (NEP) scale, and claimed the improved validity of scale. It is based on the idea that socio-economic and technological domain of human society is changing continuously and therefore, people's beliefs toward environment are also changing and new worldviews are emerging (Dietz, Dan and Shwom, 2007), for instance; emergence of belief about likelihood of eco-crisis and Antiexemptionalism among American public (Dunlop, et al., 2000; Cornado, Welcomer and Scherer, 2003). In the revised NEP Scale five types of environmental beliefs are included; Balance of nature, Eco-crisis, Antiexemptionalism, Limits to growth, and Human domination (Dunlap, et al., 2000).

Balance of nature refers to the belief that fragile and delicate nature of ecosystem exists, which can easily be broken if not considered. Eco-crisis refers to the likelihood of crisis of natural environment and resources due to human interferences. Antiexemptionalism measures the belief that human beings are within the law of nature and we should insure to make the earth livable. Limits to growth refers to the belief that human being are reached a stage where

limited resources available. Human domination refers to the belief that humankind is meant to dominate other species (Dunlop, et al., 2000; Cornado, et al., 2003).

The NEP Scale acknowledges individual's general belief about biosphere and also considers that human beings are affecting natural environment (Stern, Dietz and Gaugnano, 1995). Therefore, people having stronger pro-environmental orientations are likely to score higher on the NEP Scale and show greater intentions to support climate change risk mitigation policies, which is found in the studies of Dietz, et al. (2007) and O'Connor, et al. (1999).

3.3. The Present Study –An Integrated Model

Based on literature review of present study, figure 1 represents a complete model for explaining predictors of climate change risk perception and policy supports. In the model, basic values is presented as a predictor for climate change risk perception and policy support, considering its influential role in determining behavioral intentions regarding different environmental behaviors (Schwartz, 1992, 2009; Stern, Kalof, Dietz and Gaugnano, 1995). In previous studies (e.g., Dunlap and Van Liere, 1978; O'Connor, et al., 1999; Leiserowitz, 2006) general environmental beliefs showed consistently positive correlations to behavioral intentions and it is also found to be influencing the risk perception (O'Connor, et al., 1999; Sjöberg, 2003) and thus included in the model.

Two variables: basic values and general environmental values were later excluded from the model because reliabilities of measurement of scales were not achieved in the data. Therefore, readers are requested to refer the 'hypothesized causal model' for the predictors of climate change risk perception and support for climate change risk mitigation policies presented in introductory part of the article.

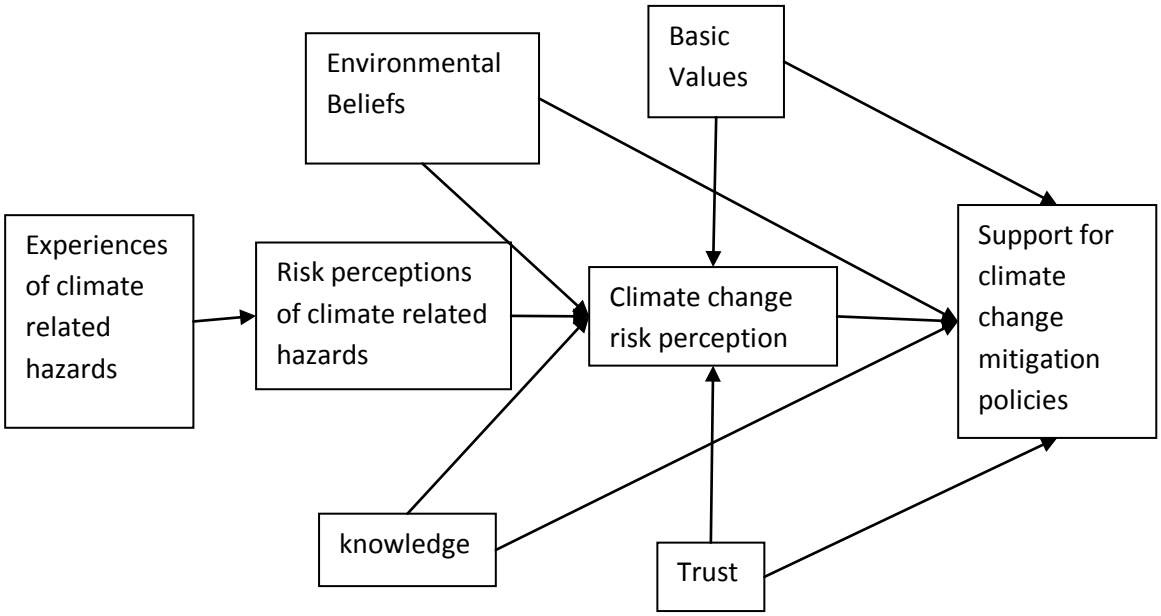

Figure 1. Hypothesized causal model of predictors of climate change policy support

4. METHODOLOGY

This methodology chapter will describe research design, sample and procedure, measurements of constructs and how the data was analyzed.

4.1. Research Design

A quantitative survey design explored the level of perceived risk of climate change and the level of public support for climate-risk mitigation policies. A survey instrument was designed to assess the participant's level of climate change risk perception, accurate knowledge about causes of climate change, individual's level of importance assigned to Schwartz's basic values as life-guiding principles, level of pro-environmental beliefs, personal experiences and perceived level of risks for flooding and landslides, level of trust in social institution/agencies working for climate change risk mitigation, and level of support for mitigation policies. All the items used in survey instrument were adopted from previous studies on the basis of high reported reliability and use in different cultural contexts. Participant's basic demographic characteristics: gender, place of residency and field of study were also assessed. The language

of administration was English. Participants were college/university students from Kathmandu Valley (covers three districts: Kathmandu, Lalitpur and Bhaktapur) of Nepal. Descriptive statistics and exploratory factor analysis of the data was carried out and the proposed model was tested in path analysis.

4.2. Sample and Procedure

A convenient or opportunity sampling technique was utilized in the twelve Colleges (affiliated to two universities: Tribhuvan University and Purbanchal University) throughout the Kathmandu Valley. Data collection began in April 2012 and ended during June 2012. The convenient sampling technique was chosen for its timely design and inexpensive cost to collect basic data in field. The surveys were anonymous and collected without any personal identifiers.

Equal number of private colleges and community based/government owned colleges from Kathmandu Valley (KV) were selected at random. Kathmandu Valley is one of the major national destinations for higher education for Nepalese student. These universities/colleges consist of students from all over Nepal with diverse economic, socio-cultural and ethnic background. Two private colleges and two community base/government colleges were selected from each district. From these colleges, classes of Bachelors and Masters Levels were selected on the basis of faculty to maintain the equal number of participants from diverse educational background. Participants were instructed to fill in the questionnaire voluntarily either in the same class or at home and collected from offices of administration in the next day. A total of 525 students received the questionnaire and 356 were returned (response rate: 67.8%).

4.3. Measurement of Constructs

Theoretical constructs used in the survey instruments are presented in the following section.

4.3.1. Climate change risk perception scale, knowledge scale, experience of flooding and landslides scale, flooding risk perception scale, landslide risk perception scale, trust scale, policy support scale

(Described in methodology section of article)

4.3.2. Schwartz's value scale

Respondents were asked to rate the importance of Schwartz's values (1996) for themselves as life-guiding principle. The 10 values used in scale were power, hedonism, achievement, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. These values were further explained in terms of their goals, and values that do not have consistent meaning across sample and culture were not included to define the representative value (for detail see, Schwartz, 1992, 1994). Response options were ranging from 1 (not at all important) to 7 (very important), so that the higher score means the greater importance of these values in life-guiding principles for respondents.

4.3.3. Environmental beliefs (NEP) scale

Public's environmental attitudes/beliefs were measured by a revised version of "New Ecological Paradigm (NEP) scale" developed by Dunlap, et al. (2000) and adopted from the study of Mark Cordano and his colleagues (2003). It includes all together 15 items measuring five different ecological dimensions. Each ecological dimension is measured by 3 items and these are the "Reality of limit to growth" (items: 6, 7, 8), "Antianthropocentism" (items: 13, 14, 15) "The fragility of nature's balance" (items: 1, 2, 3), "Rejection of exemptionalism" (items: 10, 11, 12) and "The possibility of an eco-crisis" (items: 4, 5, 9). A seven-point agreement scale was used for response option (1= "strongly disagree" to 7= "strongly agree"). Lower scale values of items 3, 5, 8, 10, 12, 14, 15 and higher scale values of items 1, 2, 4, 6, ,7, 9, 11, 13 represent higher in pro-environmental orientation. A slightly lower value of Cronbach's Alpha (.78) was achieved than the original study (.83).

4.4 Data Analysis

Descriptive statistics was used to evaluate the characteristics of measured variables and nonparametric tests were used to test the group differences. Mean scores of each individual item in the scales were calculated before factor analysis. A series of Exploratory Factor analysis was conducted for each variable before the model test except for the knowledge scale. Before the model test, each item of the knowledge scale was re-coded in '1' as correct response and '0' as incorrect response, and their mean score was used in model test. Higher value of mean score was interpreted as higher knowledge about the cause of climate change. Due to the uni-dimensionality of the scales, that appeared in the exploratory factor analyses, the following scales were kept as a single variables in the model test: climate change risk perception, flooding risk perception, landslides risk perception and trust. Outputs of factor analysis for these variables are reported in the following sections.

4.4.1. Factor analysis of climate change risk perception (CCRP) scale:

Initial Principle Component Analysis (PCA) conducted with 9 items with Direct Oblimin rotation revealed that the item 'effect of climate change on non-human nature' had very low loadings and, so excluded from the list. Two components have Eigenvalues over Kaiser's criterion of 1 and in combination explained 58.26% of the variance (Appendix A). Two items: 'general concern for climate change' and 'current impact of climate change around the world' are represented by second component but both items had also significant loading on the first component. Therefore, single component of CCRP scale was assumed. In PCA with one factor, the Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .855, ('great' according to Field, 2009) and all KMO values for individual items were > .82, which is higher than the acceptable minimum level, > .5 (Field, 2009). Bartlett's test of sphericity; chi^2 (28) = 947.65, $p < .000$, indicated that correlation between items were sufficiently large for PCA. A single component in CCRP scale explained 47.59% of total variance.

4.4.2. Factor analysis of flooding risk perception (FRP) Scale

A principle component analysis (PCA) was conducted on the 7 items of FRP scale with fixed number of factor extraction. Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .82 ('great' according to Field, 2009) and all KMO values for individual items were > .65, which is greater than acceptable limit, > .5 (Field, 2009). Bartlett's test of sphericity; chi^2 (21) = 1028.21, p < .000, indicated that correlation between items were sufficiently large for PCA. A single component in FRP scale explained 49.95% of total variance. However, PCA with Eigenvalue greater than one as criterion suggests two components, comprising two items: confidence on knowledge about mitigation and perceived controllability of severe outcomes as a second component (Appendix A) but only one component was retained for further analysis. This is because these two items forming second components have also enough loading if single component extracted. Furthermore, Pearson correlation between these two components is found be .43, a likely for the multicollinearity problem.

4.4.3. Factor analysis of landslides risk perceptions (LRP) scale

A PCA was conducted on the 7 items of LRP scale with Eigenvalue greater than one as a criterion extraction. Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .84, ('great' according to Field, 2009) and all KMO values for individual items were > .76, which is higher than acceptable limit, > .5 (Field, 2009). Bartlett's test of sphericity; chi^2 (21) = 1307.35, p < .000, indicated that correlation between items were sufficiently large for PCA. Two components in the scale explained 73.84% of total variance and Pearson correlation between these two components is high enough (.46) for the problem of multicollinearity. The second component was loaded over items: confidence on knowledge about mitigation and perceived controllability of severe outcomes (Appendix A). Since these two items also showed enough loading when a single component is extracted (fixed factor

criterion as one). A single component in LRP scale was retained for further analysis which explains 55.28% of total variance.

4.4.4. Factor analysis of social trust (ST) scale

Initially, an exploratory factor analysis on the 7 items of ST scale with Eigenvalue greater than one as a criterion extracted two components. Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .70, ('good' according to Field, 2009) and all KMO values for individual items were > .67, which is higher than the acceptable limit, > .5 (Field, 2009). Bartlett's test of sphericity chi^2 (21) = 886.71, p < .000, indicated that correlation between items were sufficiently large for PCA. The first component was loaded from the first three items (Scientists, NGO's and INGO's) and second component was loaded from the remaining four items (Appendix A). However, PCA with fixed one factor criterion results showed that these all items have significant loading over single component. Therefore, a single component in ST scale was retained, which explains 45.82% of total variance.

4.4.5. Measurement of Schwartz's values

The normal distribution of responses could not be achieved in responses of all scale items. The distribution is positively skewed. Mean scores of all values are found fairly equal, except security value (M = 6.54, SD = 1.44), which is highest. Participants assigned fairly equal importance in all the conflicting and competing values. For example, participants who assigned higher importance of self-enhancement group of values: power (M = 5.21, SD = 1.62) and achievement (M = 5.81, SD = 1.26), also assigned similar level of importance for self-transcendence values: universalism (M = 5.77, SD = 1.41) and benevolence (M = 5.60, SD = 1.33). Similar results were found in another dimension of Schwartz's value system – openness to change (self-direction M = 5.66, SD = 1.47; stimulation M = 5.27, SD = 1.38) and conservation values (conformity M = 5.54, SD = 1.43; tradition M = 5.25, SD = 1.49). Significant positive correlations between all the conflicting values are also found in the data

(Appendix B). Therefore, this variable is ruled out for further analysis due to a likely severe positive response bias.

Factor analysis results also support the decision about exclusion of basic value scale from model test. A PCA on 10 items of basic value scale with Eigenvalue greater than one as a Kaiser's criterion for factor extraction showed that two components had Eigenvalue greater than one. (Appendix A). The first component can be interpreted as Self-enhancement values types (comprising power, achievement and hedonism), however, second component had significantly loading over conflicting values: openness to change and conservation value types, and also had substantially loaded by Self-transcendence values.

4.4.6. Measurement of environmental beliefs (NEP)

In NEP scale, the average mean score of reversed items (items 3, 5, 8, 10, 12, 14 and 15) is found to be 4.52 (SD = .09) and the average mean score of straight items (items 1, 2, 4, 6, 7, 9, 11, and 13) is 5.55 (SD = 1.51). Participants showing higher pro-environmental beliefs also scored higher on anti-environmental belief statements. As expected, the reversed item 14 had a significant negative correlations with straight item 1 (-.158), item 7 (-.187), item 9 (-.123) and item 13 (-.137). Similarly another reversed items 15 is significantly correlated in a negative way with straight item 1 (-.121), item 3 (-.109), item 7 (-.152), item 9 (-.177) and item 13 (-.206). However, correlations between remaining items in the scales are either non-significant or positively significant. There is a likely severe positive response bias in the data and, therefore NEP scale is not included in the model test.

Principle Component Analysis results did not support the dimensionality of Revised NEP scale (Dunlap, et al., 2000). An initial analysis was run to obtain Eigenvalues for each component in the data. Three components have Eigenvalues over Kaiser's criterion of one and in combination explained 50.67% of the variance. It is hard to evaluate the component according to the items that loaded on these three components. At least one (or more) item

from all the five dimensions of NEP scale was loaded on the component 1 (Appendix A). Two items from Antianthropocentism were loaded on the component 2. One item from each dimension: the fragility if nature-balance, possibility of an eco-crisis and reality to limit to growth, was loaded on the component 3. This is also a reason why NEP scale did not considered for model test

5. ARTICLE

Climate Change Risk Perception and Policy Support for Mitigation Measures: A Case of Nepal

ABSTRACT

This study investigates factors contributing to higher level of climate change risk perception and support for climate-risk mitigation policies. Data comes from a survey among college/university students from Kathmandu valley, Nepal (n =356). A model proposed for causal influences on higher support for mitigation policies was analyzed using path analysis. Analysis showed that higher level of climate change, risk perception, correct understanding of causes and higher social trust are contributing to stronger public support for carbon-focused, geo-engineering, and general green policies. Personal experiences and higher perceived risk of landslides, but not flooding, is found to be responsible for higher level perceived climate-risk and influenced the policy support indirectly. Social trust influences support for carbon-focused and geo-engineering policies indirectly via risk perception. Knowledge about causes of climate change and trust are not affecting general green policies.

Key words: climate change, risk perception, mitigation policies, hazard-experience, Nepal

1. INTRODUCTION

In the socio-political context, public risk perceptions are a critical issue for policy makers (Leiserowitz, 2006). Public risk perceptions motivate people to behave in a certain way that could define effectiveness of policy decisions. Furthermore, for a long term environmental issue like climate change, public intentions to support various climate change mitigation policies are strongly influenced by public perception of risk and danger connected to climate change (O'Connor, Bord and Fisher, 1999). A substantial literature on risk perception argues that climate change is a complex issue in terms of human understanding (Klöckner, 2011), risk characteristics (Swim, et al., 2009) as well as public intentions towards mitigation measures (O'Connor, et al., 1999). However, public support is inevitable for successful implementation of strong policies (Bostrom, et al., 2012) such as for example increasing taxes on fossil fuels.

In this context, risk perception of climate change in Nepal seems important for designing policy measures for the following reasons: First, the IPCC Fourth Assessment report indicates that human activities have accelerated the process of global climate change, and its visible effects have been recorded in Nepal (NCVST, 2009). Despite having only 0.4 percent of the total global population and being responsible for only 0.025 percent of total GHG emissions in the world (Regmi and Adhikari, 2007), Nepal is and will be affected disproportionately, especially from increasing atmospheric temperature, alteration of the annual rainfall cycle, flooding and landslides (Climate Change Policy Nepal, 2011).

Second, the IPCC assessment report (2007) on climate change impact, adaptation and vulnerability clearly underutilizes psychological knowledge to explain humans' climate related behavior (Klöckner, 2011), and the same is true for reports from Nepal (climate change policy Nepal, 2011). Institutions working on climate change adaptation and mitigation

measures in Nepal are mainly focused on technical aspects. Evidences for those programs implemented on basis of public perceptions of the climate change are hardly found, it rather seems that fund availability, donor interest and political will and commitments are the major concerns (for detail, see Regmi and Adhikari 2007; Climate Change Policy Nepal, 2011). The general public often has its own perspective towards environmental issues and support or opposition of a certain risk mitigation approach depends upon how risks are perceived; examples can be found for genetically modified food (Siegrist, 2000) and nuclear power generation (Drottz-Sjöberg and Sjöberg, 1990). Thus, the self-claimed effectiveness of climate change risk reduction programs in Nepal is doubtful because of their negligence about public perceptions of climate change and mitigation interests.

There is a negligible amount of research on climate change risk perception conducted in Nepal so far (Maharjan, Sigdel, Sthapit and Regmi, 2011 as one of the few examples). In contrast to that we can find several climate change risk perception studies conducted in developed countries from Europe or America (e.g., O'Connor, et al., 1999; Leiserowitz, 2006; Bostrom, et al., 2012). However, public perceptions about climate change have been shown to vary both temporally as well as spatially (Leiserowitz, 2007a). On the international level, support for strong environmental policies has been found to be associated with different types of beliefs people hold; for instance, high objective risks for Bangladesh and high post-materialist values for Nordic countries (Inglehart, 1995). The possible differences in the result for climate change policy support among Nepalese people compared to other countries can therefore provide a ground for cross-country comparison.

The aim of the study is also to get a better and more structured understanding of the psychological processes that link personal experiences of climate-related hazards and support for climate change risk mitigation policies. Public concern for dangers and threats imposed by flooding and landslides has noticeable impact on climate policy implementations (Whitmarsh,

2008; Spence, Poortinga, Butler and Pidgeon, 2011). Thus this study aims to produce some insights on how to link public perceptions of such potentially climate change related natural catastrophes with people's preferences for different climate risk mitigating policies. This study further aims to explore the role of public understanding of the causes of climate change and people's trust in the leadership of various social institutions and agencies working in the field of climate risk mitigation measures as variables impacting the process of translating risk perception into policy support.

2. FACTORS AFFECTING THE SUPPORT FOR CLIMATE CHANGE MITIGATION POLICIES

In the following sections, following potential factors influencing support for climate change policies are introduced and discussed: climate change risk perception, climate-related hazards experiences and their perceived threat, knowledge about the causes of climate change and public trust in social institutions working for climate-risk mitigation.

2.1. Climate Change Risk Perception

A substantial amount of literature exists on risk perceptions and its importance for public support for risk mitigation measures (e.g., O'Connor, et al., 1999; Spence, et al., 2011; Bostrom, et al., 2012). However, there are only a limited number of studies on public perception related to climate change risk and behavioral intentions. These studies suggest that higher levels of perceived climate change risk predict behavioral intentions to support risk mitigation policies as well as willingness to take voluntary actions to a certain extent (Leiserowitz, 2006; Swim, et al., 2009; Bostrom, et al., 2012; Bord, Fisher and O'Connor, 1998). It is well established that risk characteristics as described in the psychometric paradigm (Fischhoff, et al., 1978) such as how threatening the risk is or to what extent the risk is understood, are predictive of risk acceptance. For climate change risk perception, perceived

newness of the risk (Fischhoff, et al., 1978), morality (Böhm and Pfister, 2001; Sjöberg, 1996), controllability of climate related hazards (McDaniels, Axelrod and Slovic, 1996), the degree to which the risk is understood (Lorenzoni and Pidgeon, 2006), perceived personal and social threat (Bord, et al., 1998), and perceived negative impact (Lin, Shaw and Ho, 2008) are among the risk characteristics that have shown to be associated with the public support for climate change mitigation policies. Furthermore, perceived likelihood of bad consequences and dread are important for increased public attention towards climate change (Lin, et al., 2008), which increases public concern about the possible consequences of the phenomenon.

According to Leiserowitz (2006), climate change risk perception and policy decisions are influenced by both the rational processing system (which is analytic, logical and deliberative) and the experiential system (which he defined as a holistic, affective and intuitive information processing). People tend to link complex, uncertain and sometimes dangerous information with their positive or negative feelings associated with that particular risk (Finucane, Alhakami, Slovic and Johnson, 2000) and this affective knowledge is more compelling, and more likely to influence human behavior than abstract knowledge (Epstein, 1994). For instance, Sjöberg (2000) found that attitudes (affective feelings of liking or disliking toward certain object) are able to influences risk perception. In this paper, it is hypothesized that public concern about climate change, the perceived likelihood of negative impacts of climate change for a person, other humans as well as on non-human nature will impact the perceived level of risk which then might increase support for mitigation measures.

2.2. Experience of Climate Change Related Hazards and Specific Risk Perceptions

Scientific evidence shows that natural hazards like flooding and landslides are potential consequences of climate change caused by anthropogenic activities (as reported in IPCC, 2001). Also the public perceives these hazardous events as outcomes of climate change

(Leiserowitz, 2007a; Lin, et al., 2008). Furthermore, the central role of direct experience in learning, perception and action in general is well identified in the psychological literature (Whitmarsh, 2008; Spence, et al., 2011). Seen from this perspective, direct experiences of hazardous events help to establish persistent and stronger attitudes, pay more attention to hazard information (Lin, et al., 2008), motivate to seek further information to improve understanding and show attitude-behavior consistency (Fortner, et al., 2000). Personal experiences of such potentially climate change related hazards are able to predict the higher perceived level of risk for the respective hazards in various studies (Lin, et al., 2008; Whitmarsh, 2008; Keller, Siegrist and Gutscher, 2006; de Man and Simpson-Housely, 1988; as cited in Whitmarsh, 2008) and experience was also found to be related to higher levels of climate change risk perception and support for mitigation measures (Spence et al., 2011; Leiserowitz, 2006). Slovic and his colleagues (2004) argued that the reason for perceiving higher risk of hazards that were directly experienced is due to availability heuristics (building on Tversky and Kahneman, 1973) and affect heuristics. People use the ease with which examples of a hazards can be brought to mind as a cue for estimating higher likelihood of hazards, feeling of dread, (un)controllability of a situation, effect on the quality of life, financial loss (Lin, et al., 20008) and these cues are remembered because of their association with affect (good or bad feelings) (Slovic, et al., 2004).

In most of the aforementioned studies, flooding and landslides are treated either collectively as non-separable events or only flooding events are mentioned as a climate-related hazard. However, risk perception of natural hazards is a function of risk characteristics of the respective hazards (Grossi, et al., 2005; as cited in Ho, Shaw, Lin and Chiu 2008) and there is a basic difference between flooding and landslides in terms of their nature and impacts (Shaw, 2006; as cited in Ho, et al., 2008). Usually, flooding impacts larger territories and creates more financial loss but fewer casualties in comparison to landslides. Differences are also

found in public perception of impact and controllability between these two disasters (Ho, et al., 2008). Assuming these differences, it is hypothesized in the present study that risk perceptions connected to flooding and landslides will predict climate change risk perception independently.

2.3. Climate Change Knowledge

Some previous studies indicated that a correct understanding of the causes of climate change is important for public support for mitigation policies (Bord, O'Connor and Fisher, 2000; Bostrom, et al., 2012). When people identify the correct causes, they perceive it as a social threat and are more motivated to act pro-environmentally (Bord, et al., 2000). In addition, Bord and his colleagues (2000) found that that considering climate change as a social threat can enhance public's willingness to engage more pro-climate actions and elicit greater political support. Better knowledge about the phenomenon of climate change among citizens is also found to influence the political decision making process and gain higher public support and acceptance to policy decisions (Lazo, Kinnel and Fisher, 2000). Furthermore, being able to identify causes accurately may enable people to predict how a certain policy works to reduce the negative impact of these causes (Bord, et al., 2000). However, the relation of climate change related knowledge with perceived risk of climate change has not gained much attention yet. It is likely that people having a higher level of knowledge can judge the complex and uncertain phenomenon climate change in a more realistic way and are also likely to perceive higher risk of climate change at the personal as well as social level. This argument is supported by the fact that experts, journalists and politicians (who possess better knowledge about climate change than the general public) perceive a higher risk of climate change than the general public (Sundblad, et al., 2009). Therefore, public understanding of the correct causes of climate change is expected to predict the higher levels of climate change risk perception in the present study.

2.4. Trust in Authorities

Past studies suggest that public trust in the relevant authorities is crucial for assessment, risk regulations and risk decision making (Slovic, 1993; Poortinga and Pidgeon, 2003). It has also been confirmed that trust in environmentalists and government bodies is a positive predictor of the acceptance of climate change risk mitigation policies (Dietz, Dan and Shwom, 2007) and also hazard-related risk policies (Lin, et al., 2008). In general, social trust is about credibility, fairness, confidentiality and faith on different social institutions (Medlin and Quester, 2002; Gefen, 2002). Preferred leadership of a certain social institution for risk mitigation reflects the mutual trust between the individual and that social institution (Slovic, 1993). When people believe that a certain group's leadership can and will protect their interests, fulfill expectations and do not harm in any way, they are likely to favor the vision/idea of the leader (Medlin, et al., 2002). There is a potential of increased climate change risk perception as a result of believing the complex risk information people get from trusted social institutions or agencies (Leiss, 1996; for e.g. Viklund, 2003). In case of supporting climate mitigation policies, public's trust in relevant institutions and agencies can thus play an indirect role in decision making with such an uncertain and less-known phenomenon (Cvetkovich, Siegrist, Murray and Tragesser, 2002). Given the complex information and complexities associated with climate change, it is expected that public trust in various social institutions can moderate the relationship between policy support and risk perception in a positive way.

2.5. Support for Mitigation Measures

Among possible climate change risk mitigation policies, general green policies like planting trees or development of renewable energy are overwhelmingly supported by the public. Opposed are policies which directly affect everyday life such as increasing taxes on fossil fuel (Bostrom, et al., 2012; Leiserowitz, 2006; Dietz, et al., 2007). This is true on both the national and international level. Although numerous studies have found that people favor the idea of

carbon reduction and support international agreements like the Kyoto protocol (O'Connor, et al., 1999) but the idea of increasing taxes is often rejected (Leiserowitz, 2006). Some studies have shown, however, that people intent to take voluntary actions even if that costs them personally if that promotes new, greener technologies and if it eventually lowers the costs of such technologies in the future (Hanemann, Labendereia and Loureiro, 2011). Other technological alternatives for climate risk mitigations, like fertilizing the ocean to make algae grow, putting dust into atmosphere and reducing air pollution from toxic chemicals, are also found to be unpopular among the general public (Bostrom, et al., 2012). In this study public support for mitigation policy is expected to be influenced by related risk perceptions, knowledge about the phenomenon and public's trust in authorities.

2.6. The Present Study – An Integrated Model

Figure 1 displays the theoretical framework which shows the relations between different psychological processes influencing public support for climate change risk mitigation policies. The causal order is based on the studies described in the previous sections. First in the causal chain are personal experiences of climate change related hazards: flooding and landslides. Then comes the perceived risk of the respective hazards. Local events are affectively associated with the image of negative outcomes of climate-related hazards – flooding and landslides – (Ho, et al., 2008) and perceived as of greater urgency than global problems (Leiserowitz, 2007b). This association is likely to help people to visualize the distant negative outcomes of climate change and therefore expected to increase the perceived level of general climate change related risk. Consistent with the causal placement, climate change risk perception is conceptualized as being affected by public knowledge about the causes of climate change and social trust. Correct knowledge about the causes of climate change can help people to become aware of threat and danger imposed personally as well as globally and should perceive higher climate-related risk. Public trust in social institutions and

agencies should increase the credibility of information about threat and danger of climate change (for further discussion, see Tritten and Musham, 2000). It might further moderate the relation between climate change risk perception and support for mitigation policies. The final outcome of the model is support for climate change policies, and is predicted by perceived risk, causal knowledge and social trust. Higher level of perceived risk, correct understanding of the cause of climate change, and higher trust in leadership of risk mitigating institutions should lead to stronger support for mitigation policies.

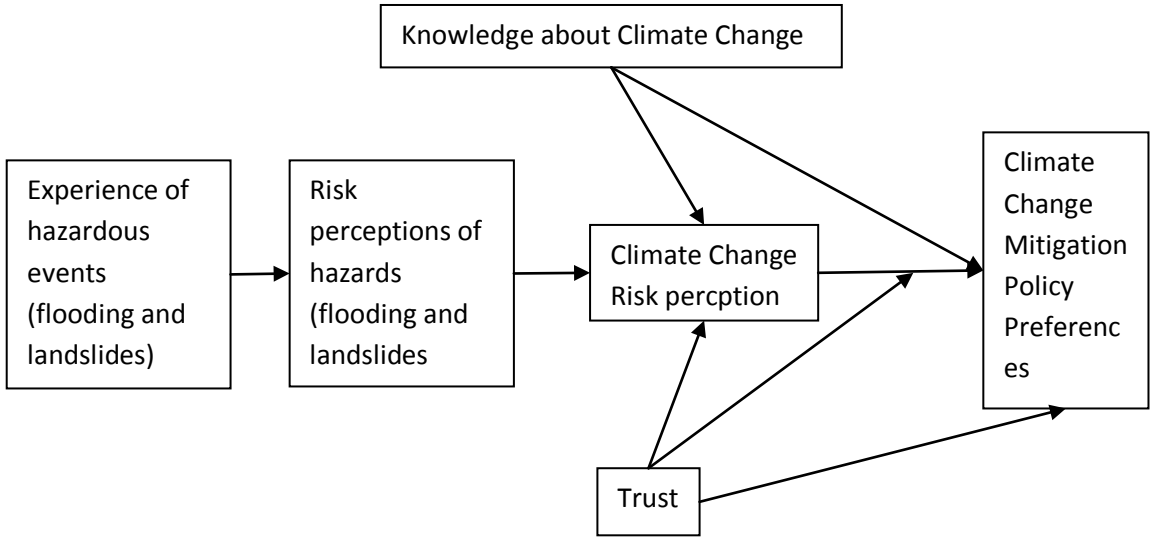

Figure 1. *Hypothesized causal model of predictors of climate change policy support.*

3. METHODOLOGY

3.1. Sample and Procedure

The data was collected by a paper-pencil-questionnaire between April and June 2012. The questionnaire was administered in English. Participants were higher secondary to master level students from colleges and universities of the Kathmandu valley, Nepal. These colleges and universities were selected to retain the representativeness of student sample for Nepal

because these institutions have students from all over Nepal, with diverse cultural, educational and financial background. The college/university classes were selected at random and instructed to fill in the questionnaire either in same class period or at home. A total of 525 questionnaires were distributed, of them were 356 returned, which results in an overall response rate of 67.8%. The proportion of male (56.9%) respondents was higher than female (43.1%). Compared to the population census preliminary report 2011 Nepal (CBS 2011), the sample over-represented participants from the Mountain regions (48.0%, census: 43.1%) and Himalaya region (15.7%, census: 6.7), but under-represented participants from the Tarai region (34.3%, census: 52.2%). 20.0% of the respondents reported natural sciences as their field of study, 22.8% were from engineering fields, 8.2% were from medicine, 16.6% were from social sciences, 20.8% were from management, and 11.5% were from art and literature.

3.2. Measurement of Constructs

The survey instrument consists of the following constructs which were all adopted from previous studies: climate change risk perception, knowledge about the causes of climate change, experiences and risk perceptions of flooding and landslides, social trust and policy support.

Climate change risk perception: The climate change risk perception scale was adopted from Leiserowitz (2006). It builds on various constructs from the psychometric paradigm (Fischhoff, et al., 1978). One item on “general concern” about climate change was re-worded to simplify the meaning of the sentence. Other items included the perceived likelihood of local and global impact on water shortages, more frequent diseases, decreased living standards, the seriousness of climate change for non-human nature, and the seriousness of the current impact of global warming. A seven-point agreement scale was used to capture a wider range of responses instead of the 4-point scale that was used in original study. A mean score

of the eight items was calculated (Cronbach's alpha = .83) for further analyses. More positive values indicate a higher perceived climate change related risk.

Experience with climate change related disasters and risk perception: The respondents' personal experiences with climate change related hazards events was assessed by the question "Have you personally experienced the natural disasters of flooding and/or landslides in your neighborhood?" Response options were "only flooding", "only landslides", "flooding and landslides" and "None or don't know." Responses were re-coded to get separate scores for flooding and landslide. Furthermore, perception of risk due to flooding and landslide were measured by separate risk perception scales having seven items each. The risk perception scale adopted from Lin, et al. (2008), a revised version of Fischhoff, et al. (1978) and Slovic (1987), was separated into two parts: one for flooding and other for landslides. It started with the introductory line "Please rate the following questions with respect to the possibility that flooding/landslides may occur in your neighborhood during the next 20 years". Respondents were asked to rate seven items from 1 (not at all) to 7 (very much) and higher score mean higher risk perception for respective hazards. The different items were "confidence over owns knowledge on mitigation aspect", "perceived controllability" (these two items were reversed before analysis), "likelihood of disaster", "threaten life", "affect life quality", "financial loss", and "dreadfulness". A mean score was calculated for each scale and Cronbach's Alpha was found to be .83 for flooding and .86 for landslides.

Knowledge about the cause of climate change: The level of knowledge about the causes of climate change was measured by a knowledge scale, originally used in O'Connor, et al. (1999). In the scale, respondents were asked to decide if different aspects listed are major, minor or no causes of climate change. The list comprises of three inaccurate causes of climate change (e.g., aerosol spray cans) and six accurate causes of climate change (e.g., people

driving their cars). The sum of correct answers was used in the analyses, higher numbers indicating a higher level of knowledge.

Social trust: A list of social organizations/institutions working in the field of climate change mitigation in Nepal was presented to the participants, and participants were asked to rate the level of trust in leadership with respect to initiatives taken to mitigate the effect of climate change. Response ranged from 1 (don't trust at all) to 7 (strongly trust). The reliability of the scale is achieved satisfactory (Cronbach's alpha= .80). A mean score was calculated with higher values indicating more trust.

Support for climate risk change mitigation policies: Participants were asked to rate their preferences for climate change mitigation policies, adopted from a study by Bostrom, et al. (2012). A list of eleven different policy measures was provided, accompanied by an introductory statement "Different types of climate change policies are adopted around the globe. How much do you support or oppose the following mitigation policies to minimize the adverse impact of climate change". Response options ranged from 1 (strongly oppose) to 7 (strongly support).

Sociodemographics: Questions related to the participants' gender, place of residency and field of study were placed in the questionnaire. To keep the questionnaire short, other demographics were not recorded.

3.3. Analytic Strategy

A series of exploratory factor analysis (principle component analysis) was performed before the model test to analyze the scales' measurement properties and dimensionality. The scales on climate change risk perception, knowledge about causes of climate change, trust in social institutions, flooding risk perception, and landslides risk perception appeared to be one-

dimensional and were consequently kept as a single variable score for the analysis. The results for the factor analysis of policy preferences are reported in the results section.

The proposed model was tested in a path analysis with AMOS 20.0 (Blunch, 2008). A path analysis approach with mean scores was chosen over a full structural equation model to reduce model complexity in relation to sample size. The model was specified as presented in figure 2. In addition to variables described above, also the interaction term between trust and climate change related risk perception was included in the model. All the disturbances or error terms between scales/variables in the same causal positions were correlated. The model was estimated using a Maximum Likelihood Method (MLM) with missing data. Along with the chi-square statistic, following multiple fit indices were considered (Blunch, 2008) to examine the model fit: the absolute fit measure (CMID/DF), relative fit measures (comparative fit indices, CFI) and root mean square error of approximation (RMSEA).

4. RESULTS

The result section includes descriptive statistics for all dependent/independent variables, the factor structure of policy support and the model test.

4.1. Descriptive Statistics

Climate change mitigation policies: The average level of support for climate change mitigation policies was, M = 5.27, SD = .98. Among the general green policies, “planting trees” was supported the most and public opposed the idea of “putting more dust in the atmosphere” to mitigate the adverse impact of climate change. Public supported the general green policies higher than carbon-focused policies and engineering alternatives. As expected, the policy related to increasing taxes on all fossil fuels was least supported by participants among carbon-focused policies. Funding research for cheaper and more efficient renewable energy technologies for climate risk mitigation was the third strongest supported policy.

Table 1. *Descriptive Statistics for Climate Change Policy Support*

SN.	Items	M	SD
1	Putting more dust in the atmosphere	2.42	1.78
2	Increasing taxes on all fossil fuels (e.g. gasoline, oil, coal , kerosene)	4.36	1.73
3	Requiring cars and trucks to have higher fuel efficiency	4.73	1.91
4	Largely replacing fossil fuel by nuclear energy	4.79	1.84
5	Creating a international market to trade permissions to emit CO2	4.87	1.91
6	Limiting population growth	5.32	1.65
7	Changing life styles to reduce consumption (e.g., using public transportation instead of private cars, buying environmental-friendly products only)	5.62	1.73
8	Reducing air pollution from toxic chemicals	5.85	1.68
9	Planting trees	6.29	1.30

Predictors:

Participants showed a high level of climate change risk perception (M = 5.25, SD = 1.08). The risk of decreased living standard for themselves was perceived to be lowest (M = 4.7, SD = 1.68), whereas the risk of water shortage due to climate change at the global label was perceived to be highest (M = 5.60, SD = 1.42).

For personal experience of flooding and landslides; 24.4% respondents reported that they had experienced flooding in their neighborhood and 13.2% landslides. One quarter of respondents experienced neither flooding nor landslides, whereas 33.7% reported that they had experienced both disasters. The percentage of respondents from Tarai (plain area) region that experienced flooding is significantly higher than that of respondents from Mountain and Himalaya regions ($F(2, 346) = 8.559$, $p < 0.001$). However, a significantly higher percentage of respondents from the Mountain region reported that they had experienced landslides in their neighborhood ($F(2, 342) = 11.001$, $p < 0.001$).

Turning to the risk perception related of flooding and landslides, respondents perceived a moderate level of dreadfulness of flooding (M = 4.76, SD = 0.97) and landslides (M = 4.81, SD = 0.102) risk. Feeling of control over severe outcomes of flooding is perceived to be

lowest (M = 3.99, SD = .088) among all the other risk characteristics, while likelihood of disastrous events scored lowest for landslides (M = 3.99, SD = .112) among the participants.

Misconceptions about the causes of climate change have been found among the respondents. The majority of respondents assumed that the use of chemicals to destroy insect pests, nuclear power generation and the use of aerosol spray cans are also potential causes of climate change. The highest portion of respondents (92.7%) reported pollution/emission from business and industry as a cause of climate change and 80.6% mentioned heating and cooling of homes as a potential cause. The percentage of respondents who was able to answer each item correctly is given below (table 2).

Table 2. *Percentage of Respondents with Correct Answer for Knowledge Items*

Cause of climate change	% of respondents given the correct answer (n= 356)
Use of chemicals to destroy insect pests	7.9
Use of aerosol spray cans	8.1
Nuclear power generation	13.2
People heating and cooling their homes	80.6
Use of coal and oil by utilities and electric complains	89.6
Destruction of tropical forests	92.7
Depletion of ozone in the upper atmosphere	93.0
People driving their cars	94.1
Pollution/emissions from business and industry	94.9

For social trust, participants show various levels of trust in different social institutions in their leadership for climate change mitigation initiatives. The highest level of trust is achieved by environmental groups (M = 5.70, SD = 1.52), followed by scientists (M = 5.48, SD = 1.64) and educational institutions (M = 5.38, SD = 1.57). Participants showed the lowest level of trust in local government (M = 4.25, SD = 1.72). National and international non-governmental organizations (NGOs: M = 4.34, SD = 1.60; INGOs: M = 4.73, SD = 1.53) are placed at the medium level of trust by the participants.

4.2. Factor Structure of Policy Preferences

Factor analysis of the policy scale revealed two conceptual factors (table 3). The first factor, interpreted as *carbon-focused and geo-engineering policies*, has high loadings for three items related to carbon focused mitigation policies and two items related to engineering alternatives. Similarly, five items highly loaded on the second factor which is related to behavioral solutions of the problems which primarily are close to the phenomenon of natural-balance, and thus interpreted as *general green policies* (Bostrom, et al., 2012).

Table 3. *Factor Analysis Results of Policy Support Scale*

	Factor Loadings	
Itemss	1	2
How much do you support or oppose the following mitigation policies to minimize the adverse impact of climate change-		
-Requiring cars and trucks to have higher fuel efficiency	**.728**	.021
-Increasing taxes on all fossil fuels (e.g. gasoline, oil, coal, kerosene)	**.784**	-.143
-Creating an international market to trade permissions to emit carbon dioxide (CO2)	**.623**	.112
-Largely replacing fossil fuel with nuclear energy	**.653**	-.081
-Funding research to make renewable energy technologies cheaper and more efficient	.249	**.668**
-Fertilizing the ocean to increase algae growth	**.529**	.115
-Changing life styles to reduce consumption (e.g., using public transportation instead of private cars, buying environmental-friendly product	.409	**.419**
-Planting trees	.048	**.752**
-Limiting population growth	-.221	**.714**
-Reducing air pollution from toxic chemicals	.051	**.724**
Eigenvalues	3.366	1.559
Variance explained (%)	33.659	15.590
Total variance explained (%)	**49.248**	

Extraction Method: Principle Component Analysis, Rotation Method: Oblimin with Kaiser Normalization

An item termed changing life-style to reduce consumption has loading on both factors but was included within the second factor because of a slightly higher loading and increased scale reliability (Cronbach's Alfa increased from .59 to .72 when this item kept). The first conceptual factor also received a satisfactory reliability (Cronbach's Alfa = .71).

4.3. Testing the Causal Model

Figure 2 represents the causal model tested to explain support for two different groups of climate change mitigation policies.

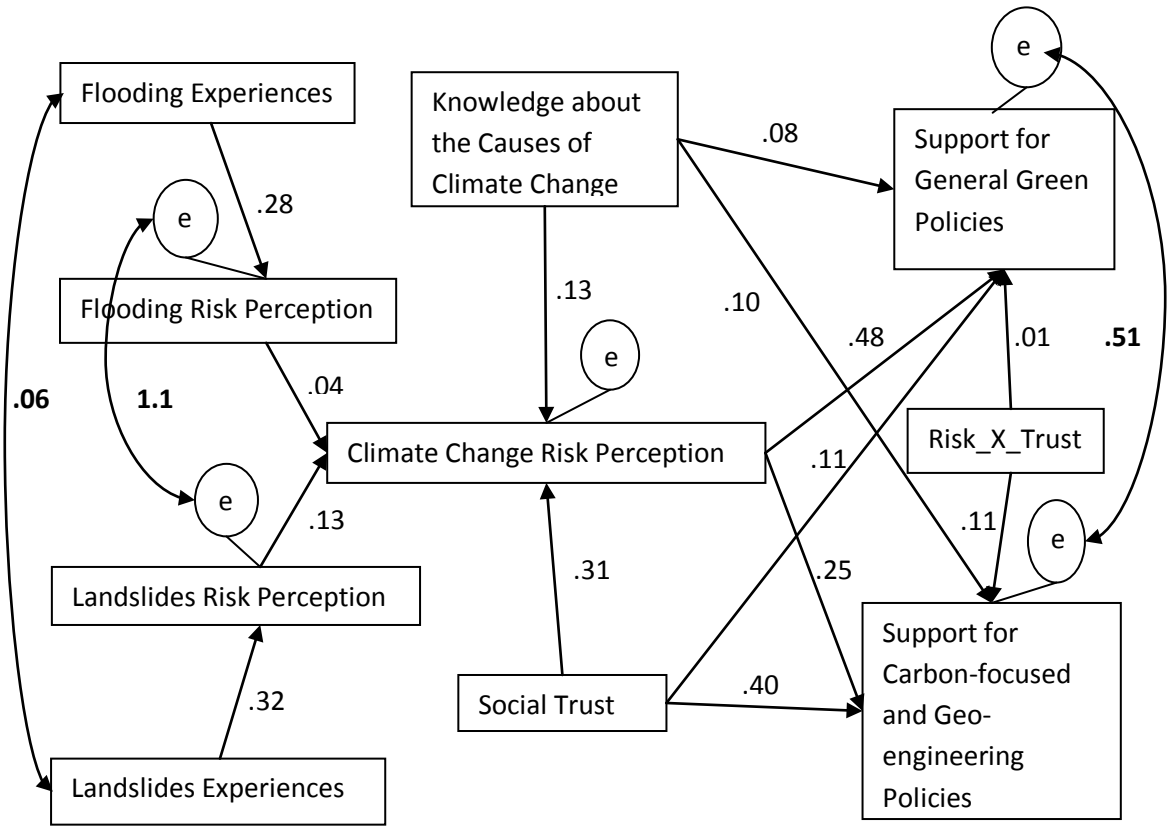

Figure 2. *Variables in the causal model used for model test in amos.20 graphic interface and numbers with line represent Standardized path Coefficients. Note: bold entries are covariance.*

Before estimating the path analysis in AMOS, error terms between the two policy factors, disaster risk perceptions, and knowledge and trust were correlated. Similarly, disaster experiences (exogenous variables) were also correlated. The following model fit indices show that the proposed model is explaining the data satisfyingly. The significant Chi-square value (Chi^2 = 53.028, df = 27, p < . 001) stands for that the model was being over-estimated but this is not a problem since the Chi^2 test tends to be oversensitive already for relatively small sample sizes (Blunch, 2008). The Chi^2 to degrees of freedom ration of 1.956 is considered as

good sign of fit for maximum likelihood estimation (Blunch, 2008). Similarly, CFI value greater than .95 (CFI = .965) and RMSEA value near to .05 (RMSEA = .052), seems to be a satisfactory for model acceptance (Blunch, 2008). The hypothesized model explained 29.6 percent of the variance in carbon-focused and engineering policy support; whereas 32.0 percent of the variance is explained in general green policy support.

Table 4 and figure 2 present the predictors of each endogenous variable in the causal model, which provides details about the pathways by which different risk perceptions, disaster experiences, knowledge, and trust affect the two different policy groups. As expected, risk perception of climate change is able to predict the intention to support both types of climate change policies. However, contrary to the expectation, flooding risk perception has no significant influence on risk perception of climate change. Risk perception of landslides increases global climate change risk perception. As expected, disaster risk perceptions are significantly predicted by their corresponding experiences. In other word, people having experiences with flooding/landslide events in their life perceived a higher risk of theses disasters than the people having no such experiences. The higher the trust in the leadership of social institutions is, the stronger is support for climate change mitigation policies related to reducing CO_2 level and engineering solutions to minimize the adverse impact of climate change. Also the prediction of the support of general green policies by social trust is significant. Moreover, social trust is able to predict climate change risk perception.

Furthermore, higher understanding of the cause of climate change can predict higher public support for the climate change mitigation policies related to carbon-focused and geo-engineering alternatives but support for general green policies is not predicted significantly.

Table 4. Regression Coefficients of Variables in the Model

	B	S.E.	Beta	P	R2
LRP←LE	.933	.114	.326	***	
FRP←FE	.780	.109	.287	***	
CCRP←FRP	.003	.050	.004	.946	
CCRP←LRP	.102	.046	.135	.028	
CCRP←ST	.311	.049	.314	***	
CCRP←K	.167	.063	.134	.011	
CEPol←CCRP	.303	.056	.254	***	
GGPol←CCRP	.486	.048	.484	***	
CEPol←ST	.474	.054	.402	***	
GGPol←ST	.105	.047	.106	.024	
CEPol←K	.154	.068	.104	.023	
GGPol←K	.106	.058	.084	.070	
CEPol←R_x_T	.127	.050	.113	.012	
GGPol←R_x_T	.017	.043	.018	.690	
CEPol					.296
GGPol					.320

*significant at 0.05; **significant at 0.01: ***significant at 0.001.

Variables: CCRP = climate change risk perception, FE = flooding experience, LE = landslides experience, FRP = flooding risk perception, LRP = landslides risk perception, K = knowledge, ST = social trust, R_x_ T = interaction term between ST and CCRP, CEPoL = carbon-focused and geo-engineering policies, and GGPol = general green policies.

An interaction term between trust and climate change related risk perception (Risk_x_Trust) was added to the model, assuming that public support for implementation of climate change mitigation policies is driven by the level of perceived risk which is moderated by the level of trust in leadership of social institutions that take part in the action. As expected, this is true for the carbon-focused policies and engineering alternatives for mitigating climate change adverse impact. In another words, people having higher levels of risk perception of climate change support the climate change impact mitigation policies to greater extent if they trust the leadership of social institutions. However, the interaction for general green policies is not significant.

5. DISCUSSION

The vast majority of the participants support most of the listed climate change mitigation policies. Interestingly, participants opposed the idea of putting dust into atmosphere. This finding supports the argument that the public perceives geo-engineering strategies as either risky or unpleasant (Bostrom, et al., 2012). Results from the factor analysis of policy support suggest that the participants did not distinguish the geo-engineering policies from carbon-focused strategies. However, mean scores of support for geo-engineering strategies are lower than for carbon-focused policies.

People also showed little support for carbon-tax increment and this could be due the perception that it would directly affect their daily life which supports the aforementioned work by Leiserowitz (2006), Bostrom, et al. (2012) and Dietz, et al. (2007). The worldwide popularity of general green policies like planting trees, using renewable energy etc., also exist among Nepalese people.

The study showed a moderate level of concern about climate change and its negative consequences among Nepalese people. Furthermore, it showed a very low level of knowledge about the cause of climate change and participants displayed common misconceptions, like nuclear power generation or aerosol spray cans as causes of climate change (e.g., Bostrom, et al., 1994; Leiserowitz, 2007b; Bord, et al., 2000). This is especially interesting since the sample consisted of well-educated students. Higher number of participants able to recognize industrial pollution as a cause of climate change and, at the same time, they reported higher support for reducing air pollution from toxic chemical. Participants might have understood climate change as air pollution, a misconception that also exists among the general public in various other countries like USA, Canada, Brazil, Portugal and Russia (Bord, et al., 1998, 2000).

Our study further points out that several factors affect public support for climate change mitigation policies and thereby provide support for the hypothesized model. The results

indicate that people having experience with potentially climate-related hazards perceive higher risk of climate risk, an effect which is mediated by higher hazard specific risk perception. Together with higher climate risk perception, more knowledge about the cause of climate change and higher trust in the leadership of social institutions elicits stronger policy support. This underlines the importance of risk perception in the public support for climate change mitigation policies; a finding that is in the line with previous studies (Leiserowitz, 2006; Bostrom, et al.; 2012, O'Connor, et al., 1999).

Most of the suggested paths in the model were significant but a few important relationships could not be shown in the present study. People having experience with flooding and landslides also perceived higher chances of suffering from respective hazards in the near future and results are in the line with previous studies of Ho, et al. (2008) and Whitmarsh (2008). In the present study, risk perception of climate change is conceptualized both as a general concern and the likelihood of specific negative consequences on the personal and global level. The important deviation from the proposed model is a missing significant relation between perceived risks of flooding and climate change risk. Flood victim's lower concern for climate change might be caused by that people did not see the direct link between flooding and climate change and rather linked flooding events with changes in weather patterns or infra-structure development (Whitmarsh, 2008). It might also be that both flooding and landslides risk perceptions are related to climate change risk perception but are so highly correlated (r=.58) that they do not have an independent effect. Separate research on the direct experiences and risk perceptions of these climate related hazards is needed to highlight their individual contribution on climate change risk perception. The significant relation between perceived risk of landslides and climate change risk perception suggests that the former was probably more likely to be perceived as related to nature imbalance. Therefore, there is some support for the statement that "highlighting the links between local weather events and

climate change is likely to be a useful strategy for increasing concern and action" (Spence, et al., 2011, p. 46).

Contrary to our expectations, knowledge about causes of climate change was not associated with the public support for the general green policies. However, knowledge significantly predicts the support for carbon-focused and geo-engineering policies. The overwhelming support for green policies that are neither "risky" nor "painful" (Bostrom, et al., 2012) seems much related to the general awareness of environmental issues. Participants, who are aware that climate change is really happening but do not have the specific knowledge about causes, simply decided to choose green policies. Bord and his colleagues (2000) reported similar results among the American public: general awareness about climate change can predict behavior intentions for mitigation even if correct knowledge is missing. For the Nepalese perspectives, more education about causes of climate change seems necessary for the general public to help them understand how a certain climate risk mitigation strategy works and improve the decision making in support of more effective policies.

The critical role of social trust in supporting climate change risk mitigating policies was also found in this study which is consistent with previous studies (Slovic, 1993, 1997; Lin, et al., 2008; Dietz, et al., 2007). Trust was able to predict policy support directly as well as indirectly via climate change risk perception. Participants report higher trust in environmental groups, scientists and academic institutions than government agencies and non-governmental organizations regarding their leadership for mitigation measures. This emphasizes the important role of environmental groups, scientists and academic institutions in communicating risks among laypeople and taking initiatives on climate risk-reducing programs on the individual/community level. Furthermore, trust in social institutions moderated the relation between climate change risk perception and carbon focused and engineering policy support. Contrary to the expectations, the hypothesis about the social trust

as a moderator for supporting general green policies was not supported in this study. For the more complex and less-known climate change risk mitigating strategies like carbon-focused and geo-engineering policies, public trust in authorities seems more important to get a wider public support than for well-known strategies like planting trees. The important role of trust in other complex technological issues like nuclear energy and gene technology has been proven previously in various studies (e.g., Sjöberg, 2001; Siegrist, 2000). A strong support for controlling population growth for climate change mitigation among Nepalese students, unlike in previous research (Leiserowitz, 2007b), is interesting and might be useful for policy makers linking climate change with such local problem to achieve higher community support for mitigation measures.

The weak relation between public support for green policies with causal knowledge and trust is different from the previous findings of Bostrom, et al. (2012), Leiserowitz (2006), Bord, et al. (2000). The high preferences for green policies irrespective of correct knowledge about the cause of climate change and trust suggest that people might simply favor planting trees and developing renewable energies without linking them to climate change. Their motive for supporting green policies may also be driven by the perception of limited availability of fossil fuel on the planet or there is simple less risk perceived to be connected to such strategies. What could go wrong if you plant trees?

The data suggests that Nepalese are moderately aware of risk imposed by climate change. Climate campaigns designed to disseminate science-based information as a means of educating the public by utilizing credibility of certain social institutions is likely to increase support for appropriate policy measures.

An important limitation of the present study needs to be addressed: The participants of the study were mainly students from colleges and universities. Such a well-educated sample from

the capital area is more likely to have media exposure, higher awareness and higher knowledge about the phenomenon than general people of Nepal, which may influence the level of policy support. Therefore, there are some restrictions in the generalization of results. Although, the sample can represent a group within the society, that has power to influence others to a great extent than the layperson. It addition, it needs to be assumed that in the general population, the level of knowledge is even lower than the level that was displayed by the sample of students.

In spite of the limited generalizability the findings suggest that a starting point for communicating climate–risk should be raising public awareness about causes of climate change. Furthermore, linking local hazard experiences and impacts with global image would be likely to increase voluntary participation in the risk-mitigation measures at individual as well as community level. People are more likely to show immediate response if the risk is affecting and threatening them at personal level and also express higher behavioral intentions for mitigation. Public perception of climate-risk can identify -who fears about to what extent and why they are; which might be the guidelines for working with vulnerable communities, formulation and implementation of programs successfully at national and local level. Furthermore, it seems important that utilizing public trust in social institutions, like environmental groups, academics is useful for public involvement in climate-risk mitigation activities in the long run and successful implementation of stronger policies like carbon-reduction, tax increments and the controversial policies like geo-engineering alternatives.

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APPENDIX

Variance/Covariance Matrix used for the analysis.

	CCRP	FRP	LRP	FE	LE	ST	K	R_x_T	CEPol	GGPol
CCRP	**1.18**	.17	.29	-.03	-.03	.41	.11	-.14	.55	.63
FRP	.12*	**1.73**	1.10	.15	-.05	.23	-.09	-.16	.17	.10
LRP	.18**	.58**	**2.06**	.01	.24	.33	-.12	-.08	.23	.09
FE	-.05	.24**	.01	**.24**	.06	.01	-.02	-.03	-.04	-.03
LE	-.06	.08	.33**	.25**	**.25**	.03	-.04	.01	-.04	-.03
ST	.34**	.16**	.21**	.01	.05	**1.19**	-.01	.02	.69	.32
K	.12*	-.08	-.09	-.06	-.09	-.01	**.74**	.04	.15	.13
R_x_T	-.13*	-.11*	-.05	-.05	.01	.02	.04	**1.28**	.13	-.05
CEPol	.39**	.10	.13*	-.07	.06	.49**	.14*	.09	**1.66**	.51
GGPol	.53**	.07	.06	-.06	-.05	.27**	.14**	-.04	.36**	**1.18**

Note: * P < 0.05; ** P < 0.01; (two-tailed) Numbers above the diagonals are covariance, numbers below the diagonals are Pearson correlations and numbers on the diagonals are variances; N = 356. (CCRP = climate change risk perception, FE = flooding experience, LE = landslides experience, FRP = flooding risk perception, LRP = landslides risk perception, K = knowledge, ST = social trust, R_x_ T = interaction term between ST and CCRP, CEPoL = carbon-focused and geo-engineering policies, and GGPol = general green policies).

6. ADDITIONAL RESULTS

The following chapter will present results that were not included in the article. Results included are descriptive and inferential statistics for mean used to examine the risk perceptions of climate change, flooding and landslides, and policy supports.

6.1. Climate Change Risk Perception

On average, participants perceived a significantly higher risk of negative impacts of climate change at the global level than at the local level in decreased in living standard: $t = 2.39$, $p < .05$, increased rate of serious disease: $t = 3.71$, $p < .001$, and water shortage: $t = 3.77$, $p = < .001$(mean and standard deviations are given in the table 1)..

Table 1. Participant's Average Scores in the CCRP Scale Items

CCRP Scale Items	Mean	Standard Deviation
Decrease living standards (Local)	4.70	1.68
Serious threat to non-human nature	4.80	1.75
Increased rate of serious disease (Local)	5.23	1.67
Water shortage (Local)	5.30	1.66
Global impact	5.40	1.46
General concern about climate change	5.41	1.37
Increased rate of serious disease (Global)	5.52	1.55
Water shortage (Global)	5.60	1.42
Decreased living standards(Global)	5.89	1.79

Participants from Tarai region perceived higher likelihood of water shortage worldwide but participants from Himalayan region perceived that water shortage would be higher at local level. However, both the differences are not significant (Tarai region: $F (2, 344) = .85$, $p = .83$; Himalayan region: $F (2, 135.66) = 1.50$, $p = .22$).

Differences are also reported among the participants from different educational background. Medical student perceived significantly higher risk on health-related impact of climate change like, increased rate of serious diseases locally ($F (5, 149.46) = 25.03$, $p < .000$, as well as globally ($F (5, 149.74) = 24.7$, $P < .000$). Participants from Natural Science background

perceived higher risk of water shortage at local level but the result is not significant (F (5,347) = .66, P = .65).

Personal experiences of climate-related hazards had no significant effect on the perceived level of climate change risk. For flooding experiences: the test statistic is, F (1, 350) = .99, p = .32 (Experienced, M = 5.20, SD = 1.05, Not Experienced, M = 5.32, SD = 1.14) and for landslides experiences: the test statistics is, F (1, 350) = 1.18, p = .27 (Experienced, M = 5.19, SD = 1.14; Not Experienced, M = 5.31, SD =1.4). However, participants with flooding experience perceived significantly lower risk of increased diseases worldwide (F (1, 349) = 5.407, p < .01; Experienced, M = 5.35, SD = 1.52 and Not Experiences, M =5.75, SD = 1.59). Female (M =4.96, SD =1.55) participants perceived significantly higher risk of decreased living standard due to climate change than their counterpart, male (M =4.52, SD =1.74; t (351) =2.44, p <.05).

6.2. Flooding Risk Perception

Flooding risk has been perceived as least controllable and highest in dread characteristics (table 2). On average, participants from Tarai region perceived a significantly higher risk of flooding than participants from Mountain and Himalayan regions (F (2, 346) =8.55, p <.001) These participants perceived the flooding as higher in likelihood, increased threat to life, a substantial financial loss and higher in dread character (table 2).

Table 2. Descriptive statistics of FRP Scale and LRP Scale

Scale items	FRP: M (SD)	LRP: M(SD)
Perceived control	3.99(1.666)	4.05(1.67)
Financial loss	4.08(2.05)	4.19(2.08)
Threaten life	4.14(2.01)	4.08(2.00)
Affect life quality	4.28(2.00)	4.17(1.97)
Confidence in mitigation knowledge	4.29(1.56)	4.18(1.63)
Likelihood	4.39(1.76)	3.99(2.12)
Dread	4.76(1.83)	4.81(1.91)

Participants with the experience of flooding events perceived higher risk of flooding than the non-experienced. They perceived flooding as higher in Likelihood, more life threatening and higher in catastrophic nature but also showed more confidence in their own mitigation knowledge; perceived higher control of negative outcomes. All these result are significant (table 3).

Table 3. Effect of personal experience of flooding events on the perceived risk of flooding

Risk Characteristics	Experienced M(SD)	Non-experienced M(SD)	F statistics (df)	p values
Likelihood	5.03 (1.61)	3.44 (2.6)	60.54 (1, 126)	.000
Confidence in mitigation knowledge	4.46 (1.62)	4.04 (1.43)	6.64 (1, 331)	.010
Perceived control	4.18 (1.75)	3.72 (1.47)	6.96 (1, 337)	.011
Threaten life	4.46 (1.97)	3.69 (1.98)	12.95 (1,348)	.009
Affect life quality	4.42 (1.87)	4.07 (2.16)	2.48 (1, 280)	.116
Financial loss	4.23 (1.97)	3.83 (2.14)	3.22 (1, 293)	.073
Dread	4.97 (1.76)	4.46 (1.88)	6.76 (1, 48)	.010
Flooding risk perception	4.53 (1.21)	3.89 (1.35)	21.64 (1, 350)	.000

There is a significant gender difference in the risk perception of flooding. Female participants perceived higher risk of flooding than male. Among flooding risk characteristics, female participants scored higher mean values on following: affect life quality of life, financial loss and dread character (table 4).

Table 4. Gender Differences in Flooding Risk Characteristics

	Female $M(SD)_n$	Male $M(SD)_n$	t-statics	p value
Affect life quality (n =352)	$4.52(2.22)_{152}$	$4.07(1.97)_{200}$	2.31	.021
Financial loss	$4.41(2.10)_{153}$	$3.83(1.98)_{201}$	2.62	.009
Dread	$5.51(1.63)_{153}$	$4.46(1.92)_{200}$	3.53	.000
Flooding risk perception	$4.44(1.35)_{153}$	$4.14(1.28)_{202}$	2.16	.031

6.3. Landslides Risk Perception

Participants identified landslides risk as highest in dread characteristics and least in likelihood of such event in near future (table 2). Participants from Himalayan region perceived higher likelihood of landslides events in their neighbor in near future ($F(2, 344) = 3.80$, $p < .05$). However, the difference in perceived risk of landslides due to the difference in participant's place of residency is not significant ($F = .487$, $p = .65$).

The variation in the perceived risk of landslides among students of different educational background is found to be significant ($F(5, 345) = 2.76$, $p < .05$). IT students are least confident in their knowledge about mitigation ($M = 3.70$, $SD = 1.67$) and perceive least controllability of landslides ($M = 3.69$, $SD = 1.82$), in opposite, medical students are scored highest mean values in both (confident in their knowledge about mitigation: $M = 4.79$, $SD = 1.32$; controllability: $M = 4.86$, $SD = 1.30$). Art and literature students perceived landslides as a highest on the risk of financial loss ($M = 4.88$, $SD = 2.01$), whereas, Natural Science students rated landslides a highest in risk of decreased life quality ($M = 4.57$, $SD = 1.8$) and threat to life for themselves ($M = 4.74$, $SD = 1.9$).

Participants with the experience of landslides events perceived a significantly higher risk of landslides than non-experienced participants (table 5). They perceived the higher likelihood of such events; could bring more negative consequences like threatening their life, decrease in life-quality, substantial financial loss; and would be more catastrophic in nature. At the same time these experienced participants also showed more confidence in their own mitigation knowledge and perceived higher control over the severe outcomes of landslides than their counterparts.

Table 5. Effect of personal experience of landslides events on the perceived risk of landslides

Risk Characteristics	Experienced M(SD)	Non-experienced M(SD)	F statistics (df)	p values
Likelihood	4.81 (1.87)	3.24 (2.06)	55.46 (1, 347)	.000
Confidence in mitigation knowledge	4.57 (1.53)	3.84 (1.62)	18.18 (1,348)	.000
Perceived control	4.36 (1.68)	3.77 (1.61)	10.89 (1, 345)	.001
Threaten life	4.58 (1.72)	3.61 (2.13)	21.71 (1, 343)	.000
Affect life quality	4.76 (1.67)	3.64 (2.039	31.06 (1, 343)	.000
Financial loss	4.73 (1.84)	3.69 (2.18)	23.50(1, 346)	.000
Dread	5.17 (1.69)	4.48 (2.02)	12.25 (1, 346)	.001
Landslides risk perception	4.71 (1.19)	3.75 (1.47)	44.94 (1, 344)	.000

Significant gender differences have been reported in the perception of landslides risk. Particularly, Female participants scored significantly higher average value on 'likelihood of events, decrease in quality of life, financial loss, and dread character. (table 6).

Table 6. Gender Differences in Landslides Risk Characteristics

	Female $M(SD)_n$	Male $M(SD)_n$	t-statics	p values
Likelihood	$4.26(2.13)_{153}$	$3.79(2.10)_{200}$	2.09	.037
Affect life quality	$4.43(2.07)_{153}$	$3.96(1.88)_{199}$	2.23	.026
Financial loss	$4.54(2.14)_{153}$	$3.91(2.01)_{199}$	2.83	.005
Dread	$5.22(1.79)_{153}$	$4.51(1.94)_{200}$	3.54	.000
Landslides risk perception	$4.44(1.44)_{153}$	$4.02(1.40)_{200}$	2.73	.007

6.4. Support for Climate Change Mitigation Policies

There is no significant difference in the support for either type of climate change mitigation policies (i.e., *carbon-focused and engineering alternatives* and *general green policies)* among the participants from three different geographical regions. For the participant's educational

background, medical student expressed higher support of either types of policies (for *carbon-focused and engineering alternatives*: F (5, 132.85) = 10.85, p < .000, and for *general green policies*: F (5, 145.78) = 13.42, p < .000).

No gender differences were recorded regarding support for climate change mitigation policies. No any significant relation between climate-related hazard experiences with either type of mitigation policies was reported.

7. ADDITIONAL DISCUSSION

The overall findings of this study implies that majority of the Nepalese people are concerned about the climate change impact and its future challenges, supports less risky, less effective way of mitigation measures like green policies but are reluctant to favor most effective mitigation policies those demand some personal costs and involvements. The predictors of policy support and their implications are discussed in article section and, here, findings about the nature of relevant risk characteristics of climate change and related hazards and personal experiences are analyzed. Finally, this research is concluded by highlighting implications of this research for developing strategies for public engagement and climate change policies in Nepal.

The common and unchallenged phenomenon of risk perception 'unrealistic optimism' (Sjöberg, 1996; Oltedal, et al., 2004) also exists among Nepalese students. The severity of climate change impact on the decreased living standard, increased diseases and water shortage at global is perceived higher than personal level. People are concerned for and aware of negative impact of climate change but the impact is perceived to be less severe in personal level and for non-human nature. Since, climate change impacts on human are perceived as distant in nature and it is conceived more distant for non-human nature (Leseirowitz, 2006).

The result suggests that participants are more concerned with the impact directly associated with Human being than the physical environments.

Personal experiences are able to elicit higher risk perceptions of respective hazards. Experiences of flooding and landslides prove that personal risks from these hazardous events are real and threatening. Personal experiences influenced their probabilistic judgments on likelihood of events, feeling of dread, and higher threat to life. The finding is in the line with previous research (e.g., Payne and Pigram, 1981; de Man and Simpson-Housley, 1988; as cited in Whitmarsh, 2008)) and support the notion that people with direct experience to climate-related hazards are more likely to accept that it poses a serious risks. Furthermore, this might be supportive evidence, participants from hazard-prone region (i.e. In Nepal, Tarai region suffers more by flooding events and more landslides events occurs in Mountain Region) perceived higher risk of related hazards. However, these hazard-experiences are not related to risk perception of climate change. Since, climate change itself is not directly observable and conceptualized through temperature changes and weather fluctuations (Ungar, 2000), which makes them hard to find direct connections (Spence, et al., 2011). Such a weak or no relationship of direct hazard-experiences with climate risk is already found in several studies (e.g., Whitmarsh, 2008; Desai and Sims, 2010). Participants experienced with landslides events also show higher confidences on their mitigation knowledge and perceived control over the impact caused by landslides. Experiences provide them more confidence for their adaptive capacity (Lin, et al., 2008)

A gender difference (common in risk perception) has been noticed in risk perceptions of climate change and related hazards. Female participants show higher risks for their lifestyles such as decrease in living standards, financial loss from climate change. They also characterize the landslides as increased likelihood of the events and will be more dreadful. For general environmental risks, gender difference has been attributed to social role and everyday

activities: the role of female as nurturer and care provider is associated with concern about health and safety issues and thus perceive higher environmental risk. (Gustafson, 1998). Another explanation is related to power relation and social control (Devidson and Freudenberg, 1996)). The unequal power relation among male and female and less social control achieved by women in a male dominant society is associated with the perception of more self-vulnerable, where as men, having higher power balance and more social control, perceive the risk more acceptable, can be handled and having some benefits. Nepalese society is characterized as patriotic society where unequal power balance between men and women is common, and women are assumed to be more responsible for household works and child rearing practices (Bista, 2001). Therefore, both the explanations are relevant in Nepalese context.

Participant's educational backgrounds have significant influences on some of risk characteristics and policy supports. Medical students are more concerned about global climate change, perceived higher impacts on health related issues and expressed higher level of support of all types of policies where as social science, and natural science students' perceived higher risk for themselves, financial loss, affect life quality. Both the differences might be attributed to their background knowledge of their own field and their causal knowledge about climate change (medical student also scored significantly higher mean score in knowledge scale (reported in article section).

Since, one of the limitations of this study is justified by the nature of data. Participants were colleges/university students, characterized as educated young adults. It is assumed that the participants fill out survey questionnaires with honest and reliable answers. The language of administration was English, which is different from mother-tongue of participants. There might be difficulty in understanding the technical terms of questionnaires as well as possibility of different interpretations by participants. This might be the reason why

participant took much time than the expected one to fill up the questionnaire. One of the possible reasons for underachieved reliability of widely used Schwartz's values scale and NEP scales in this study could be the use of English language. Although, values are also influenced by age and level of education also –'they determine opportunities and constraints people confront and their sources of coping' (Schwartz, 2009 p.6). In this perspective, these students are different from the rest of society in their value preferences and may represent a subgroup within the society that holds different value priorities (Schwartz, 1994). However, this is hard to explain according to their uniqueness in giving equal importance to all competing values. The former might be good explanation for this and also the reason for indifferent responses recorded in straight and reverse scale items of NEP scale. Furthermore, cultural bias has been reported in some previous studies regarding value measurements in eastern societies (Mathews, 2000) and there is no evidence to rule out for this in the present study.

Besides these limitations, this research, a first attempts to conduct a detailed study applying psychological approach to examine factors affecting climate change risk perceptions and policy support for mitigation measures among Nepalese people, may able to reflect basic architect of Nepalese image of climate change and motivate further research. Conversing all the findings of this research, public perception of climate change is important for the support of mitigation policies. As the climate change is complex in human understanding and multidimensional in its impact and consequences, communication of basic principles of climate change should be the starting point for any risk-mitigation measures. Understanding the Images of threats that the climate change imposed in the public mind could be helpful in indentifying the link between personal behaviors with this global phenomenon. In the future, Interventions utilizing public motivations behind such climate change-related personal

behaviors would be useful to combat negative impact of climate change and GHG emission reduction in Nepal.

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APPENDIX A

Factor Analysis Results

Table1. Factor Analysis Results of CCRP Scale

Items	Fixed (1) factor extract	Based on Eigenvalues < 1	
	1	1	2
-General concern about climate change	.462	.458	686
-Worldwide, most people's standard of living will decrease	.731	.730	168
-Worldwide water shortages will occur	.724	.726	405
-Increased rates of serious disease worldwide	.793	793	094
-Your own standard of living will decrease	.722	722	083
-Water shortages will occur where you live	.63	643	568
-Your own risk of getting a serious disease will increase	.811	811	040
-Current impacts of global warming around the world	.577	581	245
Explained variance (%)		47.599	13.169
Total explained variance (%)	**47.59**	**60.768**	
Factor correlation		.18	

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin (for the criterion Eigenvalue <1) with Kaiser Normalization

Table 2. Factor Analysis Results of Flooding Risk Perception Scale

Items	Fixed factor extract	Based on Eigenvalues < 1	
	1	1	2
-How likely do you think it is that flooding will occur?	.710	.596	.252
-How well do you know how to prepare in order to mitigate flooding?	.501	.067	.825
-How much control do you feel that you have over the severe outcomes of flooding?	.414	-.052	.879
-How likely do you think it is that your life will be in danger due to flooding?	.851	.822	.103
-How likely do you think that your "quality of life" will decrease due to flooding?	.841	.867	.003
-How likely do you think it is that flooding will cause substantial financial loss for you?	.855	.932	-.092
-In general, how afraid are you of flooding?	.637	.712	-.100
Explained variance (%)		49.953	18.129
Total explained variance (%)	**49.953**	**68.082**	
Factor correlation		.43	

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin (for the criterion Eigenvalue <1) with Kaiser Normalization

Table 3. Factor Analysis Results of Landslides Risk Perception Scale

Items	Fixed factor extract	Based on Eigenvalues < 1	
	1	1	2
-How likely do you think it is that landslides will occur?	.778	.437	.592
-How well do you know how to prepare in order to mitigate landslides?	.606	.000	.889
-How much control do you feel that you have over the severe outcomes of landslides?	.546	-.072	.893
-How likely do you think it is that your life will be in danger due to landslides?	.835	.870	.023
-How likely do you think that your "quality of life" will decrease due to landslides?	.833	.939	-.095
-How likely do you think it is that landslides will cause substantial financial loss for you?	.841	.944	-.070
-In general, how afraid are you of landslides?	.703	.676	.109
Explained variance (%)	55.287	55.287	18.560
Total explained variance (%)	**55.287**	**73.847**	
Factor correlation		.46	

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin (for the criterion Eigenvalue <1) with Kaiser Normalization

Table 4. Factor Analysis Results of Social Trust Scale

Items	Fixed factor extract	Based on Eigenvalues < 1	
	1	1	2
-Scientists	.560	.054	-.615
-NGO's	.698	-.055	-.893
-INGO's	.735	.013	-.868
-Central government	.785	.606	-.323
-Local government	.677	.624	-.175
-Educational institutions (academic research programs)	.651	.916	.153
-Environmental groups	.606	.746	.033
Explained variance (%)		45.829	16.454
Total explained variance (%)	**45.829**	**62.283**	
Factor correlation		.46	

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin (for criterion Eigenvalue <1) with Kaiser Normalization

Table 5. Factor Analysis Results of Basic Value Scales

Items	Factor Loadings	
	1	2
-Power: attainment of social status and prestige, and	-.167	.909

control or dominance over people and resources; authority, wealth, social power.		
-Achievement: competence, ambitious, successful, capable, influential.	.436	.509
-Hedonism: pleasure or sensuous gratification for oneself, enjoying life.	.201	.607
-Stimulation: excitement, novelty, and challenges in life; a varied life, an exciting life.	.546	.263
-Self-direction: creativity, freedom, choosing own goal, curiousness, being independent.	.741	-.060
-Universalism: understanding, appreciation, tolerance, protection of welfare of all people and for nature, unity with nature, protecting the environment.	.603	.195
-Benevolence: need of affiliation, helpful, loyalty; being forgiving, honest, responsible; true friendship, mature love.	.790	-.030
-Tradition: respect, commitment, and acceptance of customs and ideas of one's culture or religion, humbleness, devoutness, accepting one's portion in life, moderation.	.707	-.078
-Conformity: obedient, self-direction, politeness, honoring parents and elders.	.867	-.168
-Security: safety, harmony, social order, family security, national security, sense of belonging, healthiness	.659	.192
Explained variance (%)	44.407	11.960
Total explained variance (%)	**56.367**	
Factor correlation	-.42	

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin with Kaiser Normalization

Table 6. Factor Analysis Results of NEP Scales

Items	Factor Loadings		
	1	2	3
-When humans interfere with nature, it often produces disastrous consequences	414	-.245	-.321
-The balance of nature is very delicate and easily upset	688	200	057
-The balance of nature is strong enough to cope with the impacts of modern industrial nations	-.197	015	-.908
-Humans are severely abusing the environment.	639	-.175	-.009
-The so-called "ecological crisis" facing humankind has been greatly exaggerated.	148	-.022	-.666
-The earth is like a spaceship with very limited room and resources.	403	-.323	-.257
-We are approaching the limit of the number of people the earth can support.	613	164	-.052
-Humans will eventually learn enough about how nature works to be able to control it.	.031	188	-.654
-If things continue on their present course, we will soon	514	-.253	018

experience a major ecological catastrophe.			
-Human ingenuity will insure that we do not make the earth unlivable.	393	096	-.335
-Despite our abilities, humans are still subject to the laws of nature.	706	122	122
-The earth has plenty of natural resources if we just learn how to develop them.	652	-.100	-.090
-Plants and animals have as much right as humans to exist.	521	-.320	-.148
-Humans have the right to modify the natural environment to suit their needs.	128	867	-.051
-Humans were meant to rule over the rest of nature.	-.032	803	-.180
Explained variance	29.476	13.639	7.554
Total explained variance		50.670	
Factor correlation:	r12 = .15, r23 = -.38, r13 = -.04		

Extraction Method: Principle Component Analysis, Rotation Method: Direct Oblimin with Kaiser Normalization

APPENDIX B

Inter-Item Correlations (Pearson) of Basic Value Scales

Power									
Achievement	.39**								
Hedonism	.32**	.41**							
Stimulation	.25**	.44**	.36**						
Self-direction	.07	.40**	.28**	.40**					
Universalism	.22**	.41**	.33**	.35**	.42**				
Benevolence	.16**	.47**	.28**	.43**	.46**	.45**			
Tradition	.16**	.34**	.24**	.32**	.32**	.41**	.51**		
Conformity	.06	.42**	.27**	.47**	.48**	.39**	.56**	.51**	
Security	.23**	.48**	.34**	.45**	.49**	.53**	.46**	.36**	.50**

Note. N = 345-255. **correlation is significant at the .01 level (2-tailed)

APPENDIX C

Survey questionnaire