

## Evidences of Climate Change in Nepal

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### Abstract

Climate Change is one of the environmental issues. It is one of the threatening problems to the climate scientists and environmental policy makers. Climate change discussion formally entered in Nepal in 1992 and Nepal was concerned with the upcoming consequences of climate change. There are several evidences of climate change and also consequences are seen. Climate Change is the result of a great many factors including the dynamic processes of the Earths itself. Climate change is not solely an environmental issue; it has implications for achieving economic growth, human security and broader social goals. Furthermore, this paper concern with a new thing and new issue was explored from the field visit December 7-11, 2014 and that was there are environmental changes in different places. It is a change or disturbance of the environment by natural ecological processes and anthropological impact.

### Introduction

Climate change, is it real or just the predictions of the scientists, has been an immense issue in this present world. Khan, (2010), states that "Climate change refers to the variation in the Earth's global climate or in regional climate over time" (p. 258). But it's sure that there are several environmental changes that we have been faced and experienced in our life. Those facts clearly signify that there are global environmental changes.

Climate Change is one of the environmental issues. It is one of the threatening problems to the climate scientists and environmental policy makers. It is one of the single greatest challenges worldwide. Ghimire (n.d) has also stated that, "Climate change discussion formally entered in Nepal in 1992, when Nepal became a party of the United National Framework Convention of Climate Change (UNFCCC) at the Rio Convention, 1992" (p. 1). From this also we can say that Nepal was concerned with the upcoming consequences of climate change.

There are several evidences of climate change and also consequences are seen. Kumar (2009) describes Climate Change as, "Climate Change is any long-term significant change in the expected patterns of average weather of a specific region (or, more relevantly to contemporary socio-political concerns, of the Earth as a whole) over an appropriately significant period of time" (p. 110). So Climate Change is the result of a great many factors including the dynamic processes of the Earths itself. Climate change is not solely an environmental issue, it has implications for achieving economic growth, human security and broader social goals. A new thing and new issue was explored from the field visit December 7-11, 2014 and that was there are environmental changes in different places. It is a change or disturbance of the environment by natural ecological processes and anthropological impact.

### Introduction of the study area (ACAP)

The study was conducted in the Annapurna Conservation Area Project (ACAP). The Annapurna Conservation Area Project (ACAP) is the largest undertaking of NTNC and also the first Conservation Area launched in 1986 and largest protected area in Nepal. It covers an area of 7,629 sq. km. and is home to over 100,000 residents of different cultural and linguistic groups. ACAP is rich in biodiversity and is a treasure house for 1,226 species of flowering plants, 102 species of mammals, 474 species of birds, 39 species of reptiles and 22 species of amphibians (ACAP 2012).

The biological diversity of the Annapurna region is equally rivaled by cultural diversity. Gurung and Magar are the dominant groups in the south, whereas Thakali, Manange and Loba are dominant in the north. Each of these groups speaks their own dialect, and has unique cultures and traditions. Besides, there are also Brahmin, Chhetri and other occupational castes although in comparatively smaller numbers. Hindu, Buddhist and pre-Buddhist religions along with a mixture of all these are prevalent across the region. Parker (2003) has stated that, "The ACAP is a project aimed at promoting sustainable development in the Annapurna region of Nepal" (p.4). The operational plan of the then King Mahendra Trust for Nature Conservation (KMTNC) established the ACAP in 198. The local people reside in the 5 districts of the 57 Village Development Committees (VDCs) of the Annapurna Conservation Area Project (ACAP). The natural and cultural features of ACAP have made it the most popular trekking destination in the country, drawing more than 60 percent of the country's total trekkers.

### Objectives of the study

The main objectives of the study are:

- i. to explore the impact of climate change on ACAP area

### **Purpose of the study**

The purpose of this study is to get the general idea regarding the impact of Climate Change and various environmental changes in the study area.

### **Evidences of Climate Change**

Climate change has been a global concern and increasing communities of scientific communities are observing the global climate change. There are various signs and symptoms of the change that has been experienced in the recent years.

Agrawal, Raksakulthai, Aalst, Larsen, Smith and Reynolds(2003) said, "The most critical impacts of climate change in Nepal are related to its water resources and hydropower generation, stemming from glacier retreat, expansion of glacial lakes, and changes in seasonally and intensity of perception"(p.28). This also signifies that Nepal is vulnerable of climate change and there may cause several consequences regarding climate change and climate hazards.

It is stated that there are impacts on water resources in Nepal. Parajuli (2010), states that, "Mean monthly discharges show that global warming would shift the peak discharge month from August to July, due to the fact the snow cover on mountain tops would melt earlier"(p. 2-3). This also signifies that Nepal is facing the consequences of the climate change. The snow capped mountain and the glaciers are changing in different ways. The predictions are made that the snow will melt earlier.

In the study area, there are several evidences of Climate Change. Regarding my concern, I have planned to study several environmental changes of ACAP area. Basically my focus is on environmental changes. The facts and data's that I have got from the study area are discussed as below:

### **Decrease in Snowfall Pattern**

During my field visit to Kathmandu-Pokhara-Ghandruk-Tadapani-Ghorepani-Poonhill-Tatopani, some of the people who have been residing at Ghorepani from last 27 years have shared me the changes that has been occurred in the environment. Basically they told that the changes of snowfall pattern and the amount of snowfall. I have also clearly seen the blooming of rhododendron on November 10, 2012 (Kartik 25, 2069). These are some of the evidences of the environmental changes that the people have shared.

One of the residence of Ghorepani, who has been residing there for more than 27 years have told that , "at my early age snow fall used to be in huge amount but nowadays the amount has been decreasing". When I went for the interview, he was preparing lunch for the people who are residing at his hotel and for himself. He shared that because of the panoramic beauty of the Himalayan range and the snowfall during January, February, most of the tourists are attracted to visit that place. Specially the November, December is good for the visit according to him because the weather seems to be pretty fine. But on January, February it would be more cold and snowfall also occurs.

In his young age, he used to observe snowfall by sitting inside his home and when they see the snow covered places after snowfall, they used to observe snowfall upto the waist of that person who seems to be about 2 feet. And also his daughter added that, "I have experienced snowfall and the destruction of vegetables because of it". They used to cook and reside within their home. When the snowfall happen, it was impossible to come out of their houses as there won't be any space to put the legs. Interestingly, when I asked what about toilet, they said that it would be very difficult to go outside their home as toilets are not attached with their home. And they have to do according to the weather conditions. And it would take some days to melt the snow covered places. After the snowfall it would be colder and livelihood would be more panic to adjust.

The above paragraph also shows that there are environmental changes during the period of 27 years. When the people were living at that place there used to be snowfall but nowadays, the amount has been increased. This also signifies that there are different environmental ups and downs. And also the vegetation has been disturbed by the environmental changes. This may lead a severe consequence in the near future. The people residing at that place would face great problems not only because of the decrease in amount of the snowfall but because of the adjustment and adaptation in the changing environment.

In the article published in The Rising Nepal on Aug 22 states "Warming in the Himalayan Region has been greater than global average. Both increasing and decreasing rainfall patterns have been detected in the area. Weather patterns are becoming more unpredictable and extreme- dry seasons become dryer and wet seasons wetter".

But a vast differences between the past and present, sadly he expressed that the environmental changes has swept away those things just they have experience and remembrance of the snowfall that used to be up to the waist of that person. What is the real change he has faced during his stay of 27 years in that place? Yes it is environmental change, a great fear and threat to the environment and the global. He explained that the snowfall pattern is also not same as previous years and the amount of snowfall has been totally decreased. The person who has experienced the snowfall up to the waist has been experiencing the snowfall even not up to his knees. He said that we couldn't find the snowfall more than 2 inch. I asked the question that why it is happening, he

was unsure what actually the cause but he told most of the people coming to his hotel used to speak about climate change and global warming and it might be the reason. Though the livelihood is not changed by this factor, they are adjusting on the environmental change that has occurred.

In a study conducted by Koirala and Bhatta (2012) on Taplejung, Khotang, Kavre, Baglung Kailali district about the changes on environment because of climate change, they noticed that Changes brought on Khotang, rainfall, snowfall, temperature and forest are going back to the last ten year. This signifies that change on snowfall pattern is also one of the evidences of climate change.

Not only this, there used to be frequent snowfall during the winter season and it would be effecting the vegetation and the business of the local people. But nowadays snowfall won't harm them as it used to do. He also explained that, most of the tourists used to come to see and experienced the snowfall but it would be very rare case because of the change of weather pattern and the change of snowfall pattern too. In the past it was sure that when snowfall but at present, it has been very difficult to predict when snow will fall.

### **Untimely Blooming of Rhododendrons**

Similarly, there is another event that I have seen along with my friends on the way to Sikha, Myagdi from Ghorepani. What a surprise, we saw a bloomed rhododendrons! In the month of November. It was November 10, a very sunny day. A picture of bloomed rhododendrons taken on November 10, 2012 is given on Annex.

It is one of the species out of over 850 rhododendron species available in the world. The scientific name of this flower Laliguransh is *R. arboretum*, and it is one of the species among 32 different species of rhododendron available in Nepal. The diverse species of this flowering plant are available from east to west of Nepal in the temperate zone. But there is the need to recognize this richness and make efforts to conserve this beautiful gift of nature. It is one of the plant species that is available above 1200 meters in the temperate zone with humidity.

The main flowering seasons is March and April when the rhododendrons are in full glory. In western Nepal the best time to see flowers is July and August. But surprisingly it was November. The best time of blooming is from late March to mid June.

In a study conducted by Koirala and Bhatta (2012) on Taplejung, Khotang, Kavre, Baglung Kailali district about the changes on environment because of climate change, they noticed that Changes brought on Taplejung and Baglung by climate change in major crops especially mustard, flowers, fruits and oilseeds. And also in other districts there were changes on rainfall, temperature, dew drought, flood, etc. With this evidence also the untimely blooming of rhododendrons may be because of climate change. But it's sure that, it is environmental changes.

On our way, we have seen the trees of rhododendrons but eventually, with a surprise there was a tree where we could notice the bloomed flower. Annapurna Post, 2012, Jan "The flowering of *Bombax ceiba* and *Rhododendron* species was observed at Doti much earlier than its flowering season by which locals as well as climate change experts said climate change had led the untimely blossom." (as cited in Raut, Neupane and Thapa, 2012, p.2).

In a study done by Tiwari, Awasthi, Malla and Situala (n.d), it is found that more than 50% respondents said that warming days have been increasing, rainfall pattern has become more unpredictable, seasons may have been changing, frequency of drought has increased, warmer wind flows these days, decreasing natural water sources, windstorm is getting stronger, changes in flowering and fruiting time (*Rhododendron*, *Bauhania* species), invasion of new plant species such as Banmara (*Machania* spp), Kalo banamara (*Ageratina adenophora*), Seto banamara (*Lantana camera*) and Gandhe (*Ageratum* spp) plant with bluish flower are found in abundance.

### **Conclusions**

There are several evidences that could be seen because of climate change and other environmental changes. If the awareness and clear plans and policies are not formulated then different countries would face different challenges and the consequences of climate change. Not only this, the countries like Nepal in the developing phase have to face several challenges. Timely adaptation and mitigation measures have to be done from local level and national level. Environmental problems used to be only for the environmentalists and the marginalized and local people will be facing most of the consequences. So the problems and changes like decrease in snowfall, untimely blooming of rhododendrons should be addressed not only in plans and policies but also practically.

The world is vulnerable to climate change. There is a dire need for promoting green entrepreneurship, sustainable energy (renewable energy solutions) usage, and low carbon economy. Efforts for climate change adaptation should be at par with mitigation efforts as the global south cannot afford mitigation measures.

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## ANNEX



**Fig: A picture of tree seen where rhododendron is blooming on November 10, 2012**





Fig: Bloomed Rhododendron

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