

Impact of Climate Changes on Human Rights: A Case Study of Tehri Garhwal District, Uttarakhand

Poonam Kumria

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Introduction

India is a large country with nearly 1.34 billion people, with about 72.2 percent of population living in rural areas directly depending on climatic conditions and natural resources for their livelihood. Climate change likely to impact all natural ecosystems like- water, biodiversity, mangroves, coastal zones, grasslands, marginal range lands, dry lands; as well as socio-economic systems. India is facing dual burden of climatic changes and globalisation. The impact of climate change is different with different geographical regions and difference in socio-economic adaptive ability. Therefore, approaches and paradigms to deal with climatic changes have to be context and region specific. Traditionally the climate change techniques focused on the mitigation measures but with changing approaches the adaptive measures have also been acknowledged as effective and equitable means to deal with the impacts of climatic changes. Most of the mitigation measures are high in terms of technology and capital. Consequently, the developed countries are making heavy investments, developing countries choose to adapt. However, allocating responsibilities for climate change and its reduction require international co-operations and negotiations. Debates on multilateral actions and blame game of climatic changes between the developed and developing countries has been sharply polarised for a long time. India has been in the eye of this storm since 1980s when debate started. This is because India forcefully made development and poverty eradication as main components within the climatic change negotiations. India does not buy the argument of developed countries that concern for the earth's present climate must supersede the historical guilt of the farmers as the major polluters or that the developing

Poonam Kumria (✉)

Department of Geography, Miranda House, University of Delhi, New Delhi (India)

countries should adjust their growth prospects in consideration of climatic changes (Narian, 2009).

In current circumstances, the rapid economic growth, expanding industrialisation, increasing urbanisation, rising incomes, rapidly increasing transport and modernising agriculture are causing serious environmental concerns. The sectoral energy consumption in energy use has been rising due to increasing production, despite a reduction in specific energy consumption pattern in almost all the sectors. Glacial studies indicate that climate change is well under way, with glaciers receding at an average rate of 10-15 meters per year. If the rate of melting increases flooding is likely in the river valleys fed by these glaciers, followed by diminished flow, resulting in a scarcity of drinking water and water for irrigation. Most of the trends show general warming of temperature as well as decreased range of diurnal temperature. A warming of 0.5o C is likely all over India by 2030, with maximum increase in North India. Increased rainfall comes in the form of fewer rainy days but more days of extreme rainfall events. Drizzle type rainfall that replenishes soil moisture is likely to decrease. Increased temperatures are likely to lead to higher levels of tropospheric ozone pollution and other air pollution in major cities of India. Most global models suggest that Indian summer monsoon will intensify with warming climates but the timings will shift, causing drying during the late summer growing season. With most of the Indian agriculture is rain fed this will have severe impact on the food production in the country. There is also a prediction of early snowmelt, which could have significant adverse effect on agriculture production, both irrigated and non irrigated areas (www.dni.gov).

Climate is changing at the global level throughout the history. This is evident throughout the different geological periods from ice age to inter-glacial periods. There are natural factors as well as human factors as causes leading to climatic changes. A significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from: Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; Natural processes within the climate system (e.g. changes in ocean circulation); Human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc. The United Nations Framework Convention on Climate Change defines climate change as -"a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (United Nation, 2006). Climatic changes are affecting human lives in all possible ways. The relationship between environment and human right has become an issue of debate. The debate emphasizes that good physical environment is a precondition for the dignity of life.

Human Rights

The Universal Declaration of Human is one of the great documents in the history of human rights (www.un.org). According to this all human beings are born free and equal. Each one of them is entitled to rights without any kind discrimination on the basis of colour, sex, religion, language, etc. Everyone has the right to life and liberty. No one in this world should be tortured. Everybody is equal as an individual before the law. There are about 30 articles in this declaration. The right to life, which is one of the most basic human rights, has an extensive environmental link. Environmental pollution- air, water, nuclear disasters, oil spilling, logging, excess withdrawal of water, deforestation, mining activities affects the life of the people to such a extent that either they leave, die or fight with government agencies for their basic right to live. As soon as water pollution damages fish stock or other marine animals, it affects the working of fisherman and in many cases put local fisherman out of work. Environmental degradation also affects the right to diversity or culture. This includes tribal community or indigenous people whose lifestyle intricately linked to natural resources around them. For example, more than 150,000 Inuit who are living in the polar areas of Canada, Greenland, Alaska, and Russia, where climate change has affected their culture and even existence (www.globalissues.org). As they are living close to nature global warming is affecting snow and ice fields of these areas. They were using these snow and ice fields as runways. Toxic water from different place of the world has contaminated marine food here. Melting permafrost is causing marine beach slumping. Glaciers are melting. New species have arrived which are unknown to people there. It is affecting the culture of hunting and food sharing in these areas.

Another important issue related with rights of humans regarding environment is environmental communication. It means if there is any mishaps then it is the duty of the government to apprise people of environmental dangers and emergencies. It can be construction of dam or road, nuclear disaster, or oil spills as this will affect the health of people living in these areas. People have right to participate in the planning and development plans applicable to their society. With the declaration of forest as reserve areas the government of India had taken all the rights from local people to use forest resources. This resulted into conflict between the government and local community. Chipko movement was such environmental movement where local women fought against the government for their rights on forest resources. The basic right of survival of human beings is right to housing or shelter. Displacement of people due to construction of river dams or power projects, or railway construction requires rehabilitation of the people living in those areas. Under the UN charter, the council is responsible for the promotion of good quality of life, employment, social and economic development, health issues, international co-operation and universal respect for human rights, cultures and outlooks. Each individual has right to clean and healthy environment for present as well as for future generations.

Study Area

The state of Uttarakhand lies between 28.43° and 31.28° north latitude and 77.32 and 81.00° east longitudes. It is surrounded by Himachal Pradesh in west, Uttar Pradesh in the south, Nepal in the east and Tibet in the north (China). Uttarakhand was carved out from Uttar Pradesh taking out 13 districts, covering an area of 53,483 sq. kms having 78 Tehsils, 95 blocks and 7227 Panchayats, in Nov. 2000. According to Census 2011, the state has a total of 16,826 inhabited villages, 86 cities/towns and only five are major cities with population over 1 lakh. The state has a population of 8.5 million with average density of 159 persons per sq km which varies from as high as 612 in Haridwar and 414 in Dehradun districts to as low as 37 in Uttarkashi and 48 in Chamoli. 89 % of the villages have population less than 500. 93% of the area of the state is hilly and 63% of the land is covered with forests. Uttaranchal is predominantly a rural state, with about 15,117 rural settlements (excluding Hardwar district). Of the total village settlements, 13,388 (or 88.6%), have populations of less than 500 persons. In the districts of Garhwal, Pithoragarh, Chamoli, Tehri Garhwal and Almora, more than 90% of rural settlements have populations of less than 500 persons.

The district of Tehri Garhwal stretches from the snow clad Himalayan peaks of Thalaya Sagar, Jonli and the Gangotri group all the way to the foothills near Rishikesh. The gushing Bhagirathi which runs through seems to divide the district into two, while the Bhilangna, Alaknanda, Ganga and Yamuna rivers border it on the east and west. Its neighbouring districts are Uttarkashi, Chamoli, Pauri, Rudrapur and Dehradun. Lying on the southern slopes of outer Himalayas, Tehri Garhwal is one of the sacred hilly districts of Uttarakhand State. Tehri name has been derived from Trihari, signifying a place that washes away the three types of sins - Vacha and Karmana or thought Sins born out of Mansa word and deed. Garh in Hindi means fort. Major portion of the district is covered by hills and forests. The areas under forests have a great importance not only in the ecology but also in the economy of the district

The survey was conducted in fifteen villages in each Vikashhand of Tehri Garhwal district. The criteria for choosing a particular village were- accessibility by the road and different elevation levels. It has been seen in the field that with the change in geographic location the social, cultural and economic life of the society changes drastically. Areas where people are mostly working in agriculture sector are in – river valleys of Bhagirathi and Alaknanda River, covering Jakhinidar and Narendernagar vikashhand. The urban areas of the district have less concentration of cultivators. In inaccessible and hilly terrain areas like- Jaunpur, Thauldhar and Bhilangana Vikashhand, the data information is not available. The Ghansali tehsil has large tract of land where we find less number of cultivators. The middle of the

district, i.e. Kirtinagar, Jakhnidar, Prtapnagar, Chamba vikaskhand people are engaged in agricultural activities. The unit of sample is Household and number of households is based on the random sampling. Total number of households surveyed was seven hundred thirty nine.

Climatic impact varies according to geographical conditions. It has negative impact on some region while positive on others. Due to extreme climatic conditions at the foothills and at the snow clad mountains, communities in these areas have to respond in different ways as part of the adoptive measures. The secondary information has been collected from various census handbooks, research articles from journals and different reports related climate change and its impact on social, cultural and economic activities of the people living in this district. The primary survey has been conduct in these study villages to study the perception of people regarding climate change.

Land Use

Remote Sensing images of land use of Uttarakhand indicates that there is decrease of seven percent in vegetative cover form 2002 to 2010 and the settlement has been increased to eight percent (Issac & Isaac, 2017). Another study indicates Majority of cultivated areas in Himayalan foothills as well as urban areas showed widespread browning. Browning trend is also visible in closed needle leaf forest areas and alpine shrubland. The trend in an earlier green-up for most parts of the Uttarakhand Himalayas. (Mishra and Chudhary, 2015)

Table 2: Land Use Pattern , Tehri Garhwal

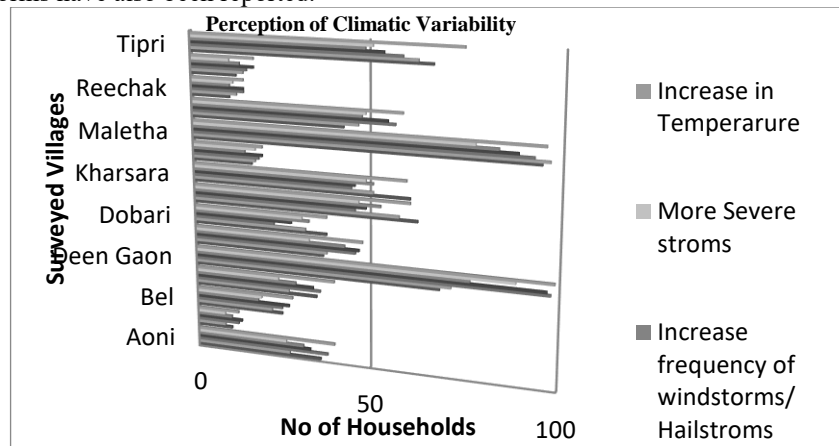
Sl. No.	Land Use	Area (in Hectares)
1	Gross Area	485517
2	Forest	321564
3	Culturable Waste Land	78517
4	Fallow Land	
a.	Current Fallow	3988
b.	Other Fallow	7265
5	Land not suitable for Cultivation	5575
6	Permanent Pastures	481
7	Orchards	2177
8	Net Sown Area	58569

Source: District at a Glance, 2011-12

The land use pattern of the district Tehri is dominated by forest land use. Over 66 percent of the land is under forest. Due to mountainous region this area is rich in flora and fauna many times causing problems to human habitations. The second major category is culturable waste land which constitutes about 16 percent of the total land use. The important land use that is net sown area is about 12 percent in the district.

Climatic Variability

Frequent droughts have been observed in the district with due to uneven spatial and temporal variation of rainfall. Increase in rainfall has been observed for all the monsoon months. The decadal increase in rainfall intensity has been noticed in this region (Mishra and Chudhary, 2015). The increased rainfall creates high runoff and leads to soil erosion and loss of top productive soil. Alongside increases in the rainfall intensity, extreme weather events including heat waves, tropical cyclones, prolonged dry spells, intense rainfall, snow avalanches, thunderstorms, and severe dust storms have also been reported.



Source: Survey, 2016

Figure1: Perceptions of Climatic Variability

Drastic and sudden changes in critical variables including temperature and precipitation have adversely affected agriculture patterns in the area causing the adoption of plantation crops and a decrease in the cultivation of grain crops (Ibid, 2015). Climatic Impact can also be seen in terms of retreating glaciers in the state. Many scientific studies analysed the retreating glaciers in Uttarakhand. Consequently, it has changed the whole eco-system in the Himalayas. It has changed the species composition and invasion of non-native species

(www.biologydiscussion.com). The survey indicates that people perceived that there are climatic changes in the district leading to erratic and less rainfall. There is high variability of rainfall, increasing the intensity for some time and then long dry spell. Majority of household perceived that temperature is becoming warmer. Rainfall is very scanty in winters even reducing the snowfall in the upper reaches.

Impact on Freshwater Resources

The responses of surveyed people in different villages responded that due to erratic nature of rainfall, the quantity of water is decreasing in the region. Moreover increase in the temperature many streams or nalas are drying. The situation is becoming grim during summer times. The onset of monsoon has been delayed and less predictive now. According to IPCC projections, climate change will significantly reduce surface water and ground water resources, thus intensifying competition for water among agriculture, industry and settlements.

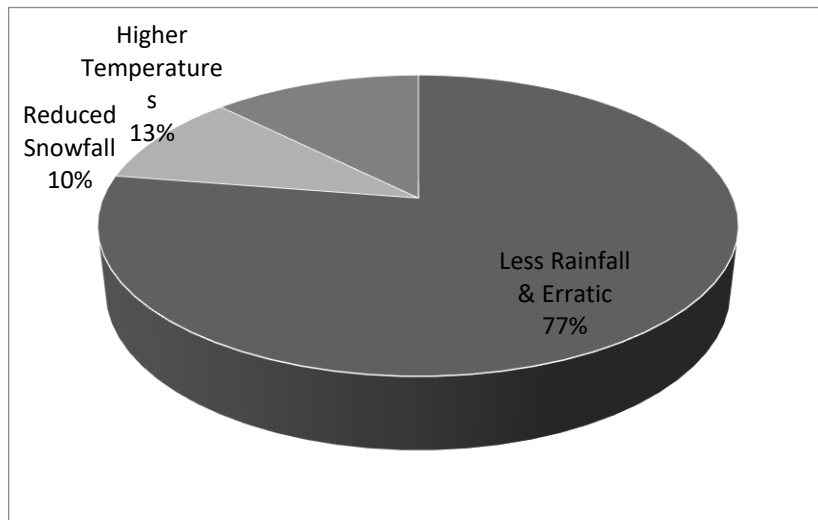


Figure 2: Causes of Water Shortage

The survey shows that most of the people responded that erratic and less rainfall is the main reason behind the water shortage. A water shortage has increased the frequency of drought in the district.

Changing Forests

The research related with climate change and vegetation in mountainous areas shows that increasing temperature combined with no gain in precipitation have negative impact on vegetation productivity, which can be cause of vegetation browning in high altitude environments. Due to less water availability and less humidity forests are also drying up. There are many areas where tree are dying. Forest dieback has its major impact on climate, water quality, wood production and livelihood. There are abundance of insects, pests and pathogens. The community response on impact of climatic changes in Tehri Garhwal region is varies with changing elevations. Majority of people responded that the there is loss of forest density due to increase in temperature and less rainfall. At higher elevations that is the areas of bhugyals and upper reaches greening has increased due to longer summer and increase in temperature. There is increase in the density of forest causing menace by monkeys as they are destroying cultivable fields in Aoni Village.

The greening can also be seen in the higher elevation areas due to increase in temperature. Earlier these areas are under perpetual snow. This is quite positive for tribal people who have large livestock population with them like people of the Reechak village. Reechak village is situated in Bhilangana vikaskhand of the Ghansali Tehsil. The accessibility to the village is very difficult. It is situated at the elevation of 2110 mts. The soil layer is thin and vegetation is scanty. This area belongs to alpine grasslands or Bhugyals as known in local language. Livestock rearing is the main occupation. Their herd consists of sheep, goats, and cows. Each household has more than 1000 sheep. It is traditional society though everyone owns a mobile here. People still eats coarse grains. Accessibility to the area is difficult. No metalled road, and no electricity in the village.

Agriculture and Food Security

The effects of climate change on crop production are already evident in many areas. Most of the agriculture area is rainfed in the district. Due to slopes and higher elevation irrigation facilities are only possible close to river or streams terraces. Late onset of the monsoon affected the annual cropping cycle. Increased temperatures result in higher yields in some areas but lower yields due to higher rate of evapotranspiration and water deficits, increased incidence and range of pests and diseases, extreme weather events cause flooding, crop loss and erosion, drought results in reduced crop yields. A new phenomenon observed in Uttarakhand was double flowering of apple and Malta orange trees, leading to two harvests in a year. This adversely affected fruit quality; fruits were smaller and less tasty. There is very little snowfall and the weather has become quite warm and it seems that this is affecting the flowering pattern of apple and Malta trees. Horticulturalists are concerned that the double fruiting could result in crop losses and impair the overall health of the

orchard, as it prevents the trees from recuperating between crops and makes them weaker. Crop seasons fall one month earlier in the valley than mid latitudes and high land areas (Macchi, et al, 2011).

Villagers have responded that there is no significant rainfall from November to March. However, there is scanty rainfall in the higher altitude. If it is an early monsoon, it damages potato, amaranth, pulses and vegetable. The intensity of rainfall has increased from few minutes to two hours, increasing the intensity to many folds, consequently damaging the standing crops. In many villages especially along the roads people have stop cultivating their fields as they are now dependent on external markets for their food requirements. Paturi is a relatively large village in Pratapnagar vikaskhand of Pratapnagar Tehsil. Due to higher elevation and hilly terrain (1628 mts.), soil is thin and also becoming unproductive as people are not cultivating the land. Agriculture is rain fed so there are shortages of water. Deen Gaon is a large village in Pratapnagar vikaskhand of Pratapnagar Tehsil. It is second highest study village. In terms of population it is the largest village. The soil is very fertile. People are mostly engaged in agriculture. Land is cultivated in all season except winter due to snowfall. Due to increase in temperature people now are able to cultivate as they have long growing season.

Conclusion

Climate change has profound effect on human rights of the people in this district. It has affected the humanized natural landscape, the whole ecosystem and natural resources upon which many lives and livelihood depend. Government has obligations to protect human rights and adopt strategies to reduce emission and ensure that climatic changes do not result in human right violations. There must be strategies to ensure public participation in environmental decision making. Climate Change has negative as well as positive impacts in the Himalayan region. With climatic changes human- nature interaction has been adapted and adopted new relationship. Human civilisation must assess the increase vulnerability of hazards and disasters in this region. The human right violations that are taking place due to gender, class, caste and environmental vagaries need to be assessed so that there is equal distribution of resources. to look into human right and environmental rights.

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