

Climate Change and Livelihood Adaptation: A Case Study of District Doda in Jammu And Kashmir State

Shayan Javeed

Assistant Professor in Economics, Institute of Mountain Environment, Baderwah Campus,
University of Jammu,
Jammu and Kashmir, India.

Abstract

Climate change is one of the most serious threats in the present the modern world. Climate change has created havoc for the sustainable rural livelihoods in developing countries. It is a potential threat to the advancement of human development and rural well-being. Poor people are most affected by climate change because of non-availability of resources and the ways of diversifying their livelihood options so as to mitigate the effect of climate change. Adaptation to climate change requires adjustments at all levels. The communities which are suffering from the climate change have to increase their resilience towards climate change by adopting appropriate technologies while make proper use of their traditional knowledge and further diversifying their livelihood options so as to deal with climate change in a better way and to make adaptation measures more effective. Indigenous knowledge is increasingly being used as a tool for climate change adaptation. Vulnerable communities have used indigenous practices to plan adaptation and disaster risk reduction activities.

Keywords: *Climate Change, Livelihood, Vulnerability, Indigenous knowledge and Temperature.*

1. Introduction

Today's world is full of various serious issues which are threat to the existence of life on earth. Of the many problems existing today, climate change is one of the major problems concerning every nation and every individual. According to IPCC (2001), "Climate change is a change in the state of the climate that can be identified by changes in the mean temperature and the variability of its properties and that persists for an extended period, typically decades or longer". Climate change is defined as

more unpredictable and extreme variations in weather conditions over a fairly long period of time. As per a report of Intergovernmental Panel on Climate Change (IPCC, 2007) the average temperature of earth has shown an increase of 0.74 degrees in the period from 1906 to 2005, and that it will continue to rise. Climate Change does not only mean that everything around us will become hotter. Instead, there will be more erratic & extreme weather conditions. Some places will have heavy rain and snow whereas other places may experience droughts and frequent heat waves. It has been internationally agreed that climate change is a serious threat to the goal of achieving sustainable development. Infact even today one can clearly see the severe impact of changing climate across various sectors like natural resource, health, food security, economic system and physical infrastructure (IISD, 2007). Thus what is required is a proper adaptation strategy so as to overcome the severe impact of climate change. Adaptation is a way of decreasing the vulnerability caused by climate change.

From the olden times, the societies have adapted to changing climate by changing their settlement areas and agricultural patterns. However, climate change induced by human beings is continuously increasing, leading to various new and complex challenges regarding climate change. Adaptation to climate change includes changes in behavior as well as change in economic structure that will help in reducing the climate change vulnerability in the society (Smith, 1996). In simple words it can be said that adaptation to climate change means doing things differently because of climate change (UNDP, 2004). Weather society is able to adapt or for how long is dependent on the available resources and knowledge and the ability to exploit them in a properly. While conducting the study one thing which prominently came to the frame was the use of indigenous knowledge by rural household as an adaptive

strategy to overcome the impact of climate change. As per (Acharya and Shrivastava, 2008), indigenous knowledge structure consists of stories, rituals, songs and folk lore etc. Berkes (2012) defines such traditional, ecological knowledge as “a cumulative body of knowledge, practice and belief, evolving by adaptation processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with their environment.

The present study focuses on the Doda District of Jammu and Kashmir state in India. The literature on the state of Jammu and Kashmir with regards to climate change is very less but whatever is available shows the state of Jammu and Kashmir is under the threat of changing climate. IMD also revealed that the temperature in to main cities of state i.e. Jammu and Srinagar has risen over time by 0.08 degree Celsius 0.05 degree Celsius per year respectively (IMD 2007). Furthermore the surface area of various glaciers has also decreased overtime because of changing climate. Thus it becomes necessary to have a look inside the climate change phenomenon in the state and analyze the various adaptation strategies being used in the study area to overcome climate change vulnerability.

2 Objective

The main focus of the study is to understand the various adaptation mechanisms being used by households in study area to overcome the harsh impact of climate change.

3 Methodology

The study was conducted across the village of three blocks of Doda district i.e. Doda, Bhaderwah and Thathri. Stratified random sampling was used to collect data. A sample of 100 households each randomly selected from the sampled blocks. Thus, the total sample size consists of 300 households. Primary data and information was collected from rural households and other relevant stakeholders using proper questionnaire and focused group discussion. Secondary data and information including village profile was obtained from government’s published and unpublished documents and research reports.

4 Results and Discussion

As earlier stated, while conducting the survey one thing which prominently comes out was the use of indigenous knowledge by the local households to decrease the vulnerability to climate change. The households argue that the government policies are not reaching the locals as they require proper scientific knowledge and training which is not possible for the poor and local households. Furthermore most of the policies of the government are meant for towns and cities and they have very

less applicability for the villages. Government policies are not being implemented properly in the village areas which results in village using their traditional knowledge to show resilience towards changing climate. Thus indigenous knowledge holds a very important place in climate change adaptation of the rural households (Bukhari, 2016). Based on this, in table 1 the households were asked regarding their concept of indigenous knowledge. The households give different perceptions regarding indigenous knowledge which is given in table 1.

TABLE 1: Opinion on Indigenous Knowledge (%age)

Perception	Doda (%age)	Bhaderwah (%age)	Thathri (%age)	Total (%age)
Local Knowledge	32	25.3	36	31.1
Traditional Knowledge	14.7	20.7	20.6	18.7
Firsthand Knowledge	12	8	6.2	8.7
Mouth to Mouth Knowledge	20	26.9	23.8	23.6
All of the Above	21.3	19.1	13.4	17.9
Total	100	100	100	100

Source: field survey

In Doda block of the sample area, among sample households (32%) consider IK as local knowledge , whereas (14.7%) consider it as firsthand knowledge, (12%) take it as mouth to mouth knowledge , (20%) consider it as traditional knowledge and (21.3%) sample household think that all the above terms can be used for indigenous knowledge. Similarly in Bhaderwah Block, among sample households (25.3%) consider it as local knowledge, (20.7%) consider it as firsthand knowledge, (8%) take it as mouth to mouth knowledge, (26.9%) consider it as traditional knowledge and (19.1%) sample household think that all the above terms can be used for indigenous knowledge. In Thathri Block, among sample household (36%) consider it as local knowledge, (6.2 %) take it as firsthand knowledge, (20.6%) consider it as traditional knowledge and (23.8%) sample household take it as mouth to mouth knowledge whereas (13.4%) consider all the above terms can be used for indigenous knowledge.

After getting the concept of IK, another thing which crosses the mind is whether IK is really an important tool to tackle climate change. Table 2 tries to analyze the thinking of local households regarding IK as tool for climate change adaptation.

Table 2: Indigenous Knowledge as a Tool for Climate Change Adaptation (%age)

Perception	Doda (%age)	Bhaderwah (%age)	Thathri (%age)	Total
Yes	53.3	61.4	51.8	55.5
No	46.7	38.6	48.2	44.5
Total	100	100	100	100

Source: field survey

A look at the table reveals that across the whole sample area 55.5 percent households believe that indigenous knowledge is an important tool for climate change adaptation whereas 44.5 percent don't believe in use of indigenous knowledge for climate change adaptation

Having talked about the use of indigenous knowledge doesn't nullify the importance of modern scientific techniques being use in the modern era. However in rural are the scientific application is because of lack of proper knowledge and infrastructure. Thus we can say that even in rural areas scientific methods of adaptation are being used but in a limited manner. Table 3 tries to analyze the used of modern scientific techniques and indigenous knowledge as a compliment for each other.

Table 3: Using Modern Techniques and Indigenous Knowledge as Compliment for Adaptation

Response	Doda (%age)	Bhaderwah (%age)	Thathri (%age)	Total (%age)
Yes	46.3	52	38.3	45.5
No	53.7	48	61.7	54.5
Total	100	100	100	100

Source: field survey

It is clear from the table that the compliment of science and indigenous knowledge is still not used in a proper way. It can be clearly seen from the table 3 that only 45.5 percent of total households are using both whereas 54.5 percent are still not using both scientific techniques and indigenous knowledge together.

The fourth most important aspect is the various adaptation mechanisms being used by the rural households to overcome the climate change vulnerability. Adaptation mechanisms refer to strategies that help the community to make adjustments to the climate change impacts. Rural households are using various adaptation mechanisms based on indigenous knowledge and limited scientific knowledge so as to lessen their vulnerability to climate change. Table 3 figures out

the various adaptation mechanisms being used by the rural households in the study area.

Table 4: Adaptation Mechanisms

Adaptation Mechanism	Doda (%age)	Bhaderwah (%age)	Thathri (%age)	Total (%age)
Crop Diversification	44.6	34.5	53.3	43.6
Mobility	29.1	22.3	22.6	28.7
Diversification in Livestock	18.2	32.8	14.4	18.3
Others	8.2	10.4	9.7	9.4
Total	100	100	100	100

Source: field survey

During the study the most prominent adaptation mechanism being used by the sample households includes crop diversification, livestock diversification and mobility. Apart from these there are some other measures which are used by very few households like small private business; dairy business etc.

A look at the data reveals that among the whole sample household's majority (43.6%) are using crop diversification as a source of adaptation followed by migration/mobility (28.7%). Furthermore (18.3%) of the households in sample area are keeping different varieties of livestock as adaptation mechanism whereas (9.4%) are using other methods of adaptation.

In Doda block (44.6%) are using crop diversification as an adaptation mechanism. The other adaptation mechanisms include migration (29.1%), keeping different livestock varieties (18.2%), and other measures (8.2%). In Bhaderwah block, among low income households (34.5%) are using crop diversification as an adaptation mechanism. The other adaptation mechanisms include migration (22.3%), keeping different livestock varieties (32.8%), and other measures (10.4%). In Thathri block, (53.3%) are using crop diversification as an adaptation mechanism. The other adaptation mechanisms include migration (14.4%), keeping different livestock varieties (22.6%), and other measures (9.7%).

Finally, the final thing which was surveyed was the success rate of the adaptation mechanism being used by the rural households. Table 4 shows the perception of the rural households with regards to the success rate of these adaptation measures.

Table 5: Success of Adaptation Measures Being Used

Perception	Doda (%age)	Bhaderwah (%age)	Thathri (%age)	Total (%age)
Successful	56	60.3	50.7	55.7
Unsuccessful	44	39.7	49.3	44.3
Total	100	100	100	100

Source: field survey

It is clearly visible from the table 5 that the adaptation strategies are moderately successful. Overall a total of 55.7 percent household have successfully used these adaptation mechanisms whereas 44.3 percent household doesn't have success in these strategies. Block wise highest success rate is achieved in Bhaderwah Block i.e. 60.3 percent followed by Doda 56 percent and at last is the Thathri block with 50.7 percent success rate.

5 Problems in Adaptation Practices

One can argue that even after having so much different adaptation the success rate is not as desired. There are many reasons for the lack of success. Some main reasons which cause problems in proper implementation of adaptation process are:

- **Lack of proper implementation:** The first reason is that there are various techniques for adaptation process but they are not properly implemented. They don't get the ground for proper implementation at the grass root level.
- **Inappropriate government policies:** Secondly, government may have various policies but they lack proper designing. The policies fail to address all the relevant stakeholders due to which policies fail to give desired results.
- **Lack of proper infrastructure:** Proper implementation of ant policy requires proper infrastructure facilities. In the absence of proper infrastructure, the results one get are not desirable.

6 Conclusion

This paper gives an analysis of the adaptation techniques being used in the study area. The study shows that rural households are dependent on indigenous knowledge to adapt rather than scientific technology because of lack of proper knowledge and information regarding scientific technology. Further whatever scientific techniques are used by locals is unable to get the desired result as that requires skills which local households don't possess. Thus what is

required is the need to have a proper system of implementation of policies so that the results are desirable. Efforts should be made to break the cyclical nature of the factors causing vulnerability at different levels with immediate, medium and long-term interventions. Having proper implementation of policies will results in better implementation of adaptation mechanisms which will help in decreasing the vulnerability of rural households and helps them in breaking the menace of climate change.

References

- [1] Acharya & Shrivastava, Indigenous Herbal Medicines: Tribal Formulations and Traditional Herbal Practices, Aavishkar Publishers Distributor, Jaipur- India. pp 440, (2008).
- [2] Berkes, F, Sacred Ecology, Third Edition. Routledge, New York, USA. Berkes, F., Kislalioglu (2012).
- [3] Bukhari, Environmental Economic Analysis of Impact of Climate Change on Pastoral Population of Poonch District in Jammu And Kashmir, University of Jammu, (2016).
- [4] IISD, UNFCCC workshop on adaptation planning and practices under the Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change, Rome, 10-12 September. Final workshop report. Winnipeg, Manitoba, Canada (2007).
- [5] IMD, Indian Metreological Department, Annual report (2017).
- [6] IPCC, Climate Change 2001 – The Scientific Basis, Contribution of Working Group I to the Report of the Intergovernmental Panel on Climate Change [Houghton, J. T., Y. Ding, D. J. Griggs, M. Noguer, P. J. van der Linden, X. Dai, K. Maskell and C. A. Johnson (eds.)], Cambridge University Press, Cambridge, UK, page 881 (2001).
- [7] IPCC, Working Group II Contribution to the Fourth Assessment Report, Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability (Geneva: WHO and UNEP IPCC, (2007).
- [8] Smith, Ragland & Pitts, A process for evaluating anticipatory adaptation measures of Mundy, P. & Compton, J. L. (1991). Indigenous Communication and Indigenous Knowledge. (1996).
- [9] UNDP, Reducing disaster risk: A challenge for development. United Nations Development Programme, Bureau for Crisis Prevention and Recovery, New York, USA, (2004).