Prismatic Horizons
Journal of Social Science and Humanities
www.phjssh.lexarcheus.com
Vol.-01, Issue-01 (Jan-Mar, 2023)



Analyzing the social and economic effects of natural disasters on vulnerable populations of Jammu and Kashmir

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ARTICLE INFO

Article History

Received	15th Jan, 2023
Revised	21st Feb, 2023
Accepted	23, Feb, 2023
Available Online	26, Mar, 2023

ARTICLE ID
PHJSSH0101001

KEYWORDS

Socioeconomic impact, natural disasters, vulnerable population, Jammu and Kashmir, sustainable development

ABSTRACT

This article examines how natural disaster affect vulnerable population groups in Jammu & Kashmir. It also explores people's resilience and government responses to natural calamities. The cross examine geographical literature suggests that Jammu and Kashmir is a disaster prone area which is affected by multiple natural disasters like earthquakes, avalanches, floods, climate change and landslides. The disaster risk reduction and management system, infrastructure, and early warning system must be upgraded to reduce disastrous risk. Understanding and adapting to climate change requires technology development. The government should form an agenda that will help to reduce the frequency of natural disasters by implementing development policies and strategies to reduce the people's vulnerability. Government should design a sustainable development policy to meet the urgent needs as well as minimize the long term negative consequences of disasters. The analysis conclude that natural disasters have diverse socio-economic impacts depending on nature, intensity and type of disaster.

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INTRODUCTION

Natural disasters cause widespread death and property destruction. Seismic, drought, flood, and landslide events are weather, geology, or biology-related. The manifestation of climate change leads to an increase in natural disasters, especially floods and wind storms, due to ocean temperature changes. People moving to disaster-prone locations may cause additional natural disasters, especially in fragile countries. Frequent disasters prevent high-vulnerability and poor countries from developing and enhancing resilience. Droughts have increased little, while earthquakes, floods, volcanoes, avalanches, and landslides have not. Evidence shows a relationship between disasters, security, and economic development. The short-term effects of natural disasters are clear, but their long-term effects are not. “Disaster” is a disruption in the operation of a community or society that causes widespread human, economic, environmental, or material losses and exceeds its ability to cope (UNISDR, 2009). Natural and man-made disasters have devastated most countries, causing millions of refugees, migrants, damaged livelihoods, and property destruction. Between 1996 and 2015, natural disasters killed 1.3 million people in rich and developing nations. Disasters killed 5 times more people in low-income countries than in high-income countries. India has several disasters due to its topography, geology, geography, climate, and low socioeconomic development. From 1996 to 2015, earthquakes, floods, landslides, and avalanches killed 97,691 Indians, the fifth highest fatality rate in the world.Jammu and Kashmir is one of the most socio-economically and politically challenging regions on Earth, and political and natural disasters have decimated its growth. After the Indian tectonic plate collided with the Eurasian plate, intermontane basins formed, which house most of the region's inhabitants. As tectonics shapes the region's geography, geology, geomorphology, and climate, earthquakes and floods may be inevitable. Our knowledge of earthquake causes instructs us to prioritize preparedness over forecast, which is partly true of flood threats.

Jammu and Kashmir is one of the worst-hit regions by natural disasters. Due to its topography and climate, Jammu & Kashmir faces many natural risks. Jammu and Kashmir has experienced devastating floods, earthquakes, avalanches, and landslides (SDMP, 2017). Over the previous 17 years, the Union Territory has seen a 2005 earthquake, 2010 flash floods and landslides, and 2014's major flood. Natural disasters damage Jammu and Kashmir's agriculture, horticulture, handicrafts, and tourist sectors (Sharma, Sharma, and Waris, 2012). Srinagar, Ganderbal, Bandipora, Budgam, Baramulla, Kupwara, Anantnag, Pulwama, Kishtwar, Doda, and Ramban are in seismic Zone V, which has 50% of the Union Territory's population. Jammu and Ladakh are in Seismic Zone IV (NIDM, GOI, 2015).

Natural Hazards in Jammu and Kashmir

In the northern region of India, the plains around Jammu to the south and the valley of Kashmir to the north define Jammu and Kashmir, a newly constituted Union Territory (until October 31, 2019, a state). A law was enacted in August 2019 to demote Jammu and Kashmir to union territory and create Ladakh as a separate union territory. Jammu and Kashmir, one of India's largest princely states, is bordered by the Indian Union Territory of Ladakh to the east, Himachal Pradesh and Punjab to the south, Pakistan to the southwest, and the Pakistani-administered Kashmir to the northwest. State belongs to western Himalayan Zone. It has steep, mountainous, and undulating terrain at 1,850–3,048 meters above sea level. Jammu and Kashmir covers 42,241 sq.kms, or 16,309

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sq. miles (en.m.wikipedia.org). The Union Territory of Jammu and Kashmir covers 42,241 sq. km between 33 o 23′ 04.62″ to 34 o 12′ 27.18″ N latitude and 74 o 15′ 43.32″ to 75 0 29′ 01.32″ E longitude. Jammu and Kashmir is a unique political place in India because it is a Union Territory and a meeting point for world powers. The temperature in Jammu and Kashmir changes seasonally.

People in Jammu and Kashmir use numerous methods to make a living amid a changing landscape. Agriculture and related sectors are crucial to Union Territory, Jammu and Kashmir's socioeconomic growth. Wheat and paddy are the other two major crops, but agriculture supports 75% of the people. Goat and sheep farming sustain nomadic people. Rainwater is the predominant irrigation source, followed by spring and canal irrigation. Jammu has tropical temperatures whereas the valley has temperate climate. The region receives the most rainfall, 1028 mm, between July and August (IMD, 2014). The Kashmir valley is earthquake-prone. Large and little earthquakes will continue as they have in the past. When, when, and how intense an earthquake may occur is impossible to forecast (UNESO and UNDP, 2007). Kashmir is earthquake-prone due to its location between the Pir-Panjal and Zanskar thrusts in the north-western Himalayas (IND, 2012). Kashmir valley is located in the western Himalayan mountain range on the site of a prehistoric lake produced by mountain uplift that silted in and became fertile through alluvium. The valley's agricultural output and seismic susceptibility result from this. In the Union Territory of Jammu and Kashmir, young folded mountains crumple rock strata, causing earthquakes of different strength and magnitude (Hussain, M. 2000). The data collection approach relies on secondary sources. This article addresses general goals including understanding Jammu and Kashmir's natural catastrophe risk. State capitals Jammu and Srinagar are in national seismic zones IV and V. To study how floods, earthquakes, landslides, and avalanches affect Jammu & Kashmir's economy. To make some practical proposals to reduce the economic impact of natural disasters on Jammu & Kashmir. To examine that the theoretical as well as empirical studies of the long-term impact of natural disasters will differ according to the type of disaster, its frequency, the contribution of international aid and the socio-economic conditions of the country. To understand the link between natural disasters and vulnerability needs more attention, especially in those areas where population pressure is high, land degradation and desertification are increasing rapidly. To design further research on how the national and regional funding mechanisms be expanded and how the inherent moral hazard and covariance could be reduced. To know more about climate change and adaptation where the focus is largely on technical issues but less attention has gone to the economic costs and benefits of different adaptation mechanisms. To learn more about natural disasters on a permanent and comprehensive basis will be a key for better understanding of adaptation to climate change. To frame such policies and strategies on socio-economic development that will build disaster risk mitigation more visible through the national plans.

Floods and avalanches affect socioeconomic development.

Valley of Kashmir is bowl-shaped. Its varied altitude and relief render low-lying areas prone to flooding. The two major urban centres of Jammu and Srinagar, where lakes and ponds act as natural sponges, have suffered significant flooding. Cloudbursts and dam failures cause flash floods, which are deadly and sudden. Floods cause high-velocity water currents that supress downstream areas within minutes or hours. These floods do massive damage in high slope locations. Human activities like deforestation and improper road development can cause landslides that increase flash floods.

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Floods result from rainfall, snowmelt, and other natural events that submerge land. Deforestation, rapid and unplanned urbanization, unstudied bridge and dam construction, and shifting vegetation patterns further increase flood risk. Floods are common in Jammu and Kashmir because large rivers including Jhelum, Chenab, and Indus flow through its populous areas. Heavy rainfall caused one of the worst Kashmir valley floods in September 2014. Due to extreme severe rainfall, the Jhelum, Chenab, and Tawi basins overflowed their embankments in just a few days, 2-6 times the average September rainfall (SDMP, 2017). Continuous rainfall from 1–6 September 2014 caused catastrophic flooding in Jammu and much of Kashmir. Jhelum, Chenab, Sindh, and Lidder basins and tributaries flowed above danger line. The Srinagar riverJehlum, 4.40 feet above the danger line, started rushing above embankments and inundated hospitals, schools, residential buildings, and other infrastructure. The sediment-laden flash flood water took down bridges in low-lying Kashmir, including Awantipora, Srinagar, Bemina, Sonawari, and Qammarwari. The flash flood in Jammu washed away 400 residential dwellings, landslides caused by heavy rainfall obstructed all lines of transit and communication, including roads, railways, mobile service access, and airplanes (Narain, S.2014).). Flash floods in 2014 destroyed crops, agricultural land, and thousands of animals (Shah, Khwaja, Shah, et al., 2018). Landslides damaged buildings, roads, and bridges. A huge landslip in Rajouri drowned away 50 bus passengers. Jammu–Srinagar national highway remains blocked, disrupting rescue efforts (Gupta, 2014). The flood destroyed around 80,000 pucca and 21,000 kachha dwellings. Over 300 people died and millions were displaced. Floods closed four of five Kashmiri hospitals . The elderly, disabled, and those with chronic conditions like diabetes and cancer were harmed by the lack of medical facilities. The abrupt power outage and damaged equipment at GB Pant hospital in Srinagar killed 20 newborns. Education was greatly affected. Many government and private school buildings collapsed in Jammu & Kashmir, leaving thousands of pupils without necessary infrastructure (Venugopal and Yasir, 2017). Food security was a priority for the current government after the floods. According to Sphere India (2014), 36% of Jammu respondents and 86% of Kashmir valley respondents observed a progressive drop in food intake. The flash flood has long-term socio-economic effects on Jammu and Kashmiris. The people of Jammu and Kashmir lost their homes, livelihoods, and animals. Jammu & Kashmir lost $15 billion by 2017 according to the Federation of Chambers of Commerce (Tabish and Nabil, 2015). The damage in Jammu and Kashmir exacerbated mental health issues. A study six months after the 2014 Kashmir flash flood found 60% of the population had acute PTSD. The study found that elders and women were more affected by depression and PTSD after floods (Fatima and Maqbool, 2017). Avalanches are common due to the Himalayas. Avalanche is the flow of snow down a mountain slope due to significant snowfall caused by climate change. One of the worst avalanches in 1995 killed 150 people and closed Jawahar Tunnel on the Jammu-Srinagar national route (Hassan, 2014). As they are stationed in hostile areas, avalanches have killed Indian soldiers. Ice, trees, mud, and rocks might fall with the avalanche, destroying lives and property. In 2017, an avalanche in Gurez area killed 20 army troops and four civilians and threatened a tourist site. Avalanches also block roads, cause shortages of essential goods, paralyze communities in high mountain areas of Jammu and Kashmir, and hurt tourism and agriculture by eroding soil. Avalanches are most common in Kashmir, Gurez, Kargil, and Ladakh. Since avalanches happen quickly, they're hard to predict.

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Earthquakes' Impact on Socioeconomic Development

Jammu and Kashmir, in the Himalayas, is in India's most seismically active zones, zones IV and V. It has been struck by multiple earthquakes. Since 1505, earthquakes have struck this area. People face serious hurdles from Himalayan and Kashmir earthquakes. Jammu and Kashmir saw 170 earthquakes between 1889 and 1990 (Hassan, 2014). Earthquakes in this region are rising, which is concerning. The valley was devastated by 1555, 1885, and 2005 earthquakes. Earthquakes are unavoidable, but mitigation can reduce their impact on people and the environment. A devastating earthquake hit Jammu and Kashmir in 1555, but its magnitude and location are unknown. Another destructive earthquake hit in 1885, affecting Srinagar, Gilgit, and Shimla in Himachal Pradesh. One million square feet were affected including Baramulla and Pattan (Lawrence, 1895). Many villages were devastated and over 3,000 people died. Kashmir has experienced deadly earthquakes for ages (Ghaffar and Abbas, 2010). In 2005, a 7.6-magnitude earthquake rocked the India-Pakistan border, affecting both nations. The most destructive earthquake killed over 80,000 Pakistanis, injured 100,000, and left 6300 Indians with significant injuries, causing a humanitarian disaster. It was the worst Himalayan earthquake ever (Anees and Bhat, 2016). Residential structures suffered substantial damage, 121 collapsed, 25% of which were in Uri and Poonch towns, bridges collapsed, and highways were blocked. The collapsed houses rendered entire families homeless (Kumar et al. 2006). Frequent earthquakes produce immediate destruction and long-term socio-economic damage. Earthquakes damaged hospitals and government buildings, disrupting health and other vital services. The terrible earthquakes also affected Jammu and Kashmir women. As family caregivers, the women felt insecure and stressed due to a lack of hygiene and food. The lack of medical and reproductive facilities hurt pregnant women.

LANDSLIDES AND SOCIO-ECONOMIC DEVELOPMENT

Landslides are widespread in Jammu and Kashmir. Young mountain ranges with unstable rock bases are here. Disruptions to the slope cause trash, mud, and rocks to flow. Earthquakes, cloudbursts, and severe rain can cause landslides. Deforestation, overgrazing, road construction, dam building, and other human activities have exacerbated vulnerability (Singh, Bhat, Sharma, et al., 2012). Floods and other discrete climatic phenomena that could restrict roads are subject to the vulnerability shadow and economic impact. Landslides and floods are more frequent due to climate change. The economic impact of a landslide and its vulnerability shadow can be divided into three categories: direct economic impact, direct consequential economic impact, and indirect consequential economic impact. Jammu & Kashmir's most landslip-prone areas include Bandipora, Anantnag, Pulwama, Shopian,Doda, and Kishtwar. A landslip from the hills damaged residences, hospitals, bridges, highways, farms, and other infrastructure. Hospital disruptions and sanitation issues harmed public health. Unplanned road and dam building causes most landslides (Singh et al. 2012). Landslides in Kashmir cause fuel and vegetable shortages, raising prices. Landslides have also disrupted religious and cultural events like the Amarnathyatra. The lifestyles of hilly farmers and nomadic groups are also affected. Landslides cover more territory and prohibit nomadic groups from grazing their animals, affecting their transhumance ship (Anees and Bhat, 2016). A 2009 landslide on the Batote-Doda road along National Highway 1B was caused by slope failure from the Baglihar hydropower plant. The devastating landslide washed away 150 m of highway, killed one person, and damaged 600,000 people's livelihood and food security for a month (Singh, Bhat,

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Sharma, et al., 2012). Mining in landslide-prone areas endangers the ecosystem and creates a vicious cycle. Landslides obstruct highways and roads, disrupting regional life. Every year, landslides obstruct the Jammu-Srinagar highway, the lifeline of Kashmir valley, stranding hundreds of vehicles.

Climate change effectson socio-economic development

The mountainous geography of Jammu and Kashmir supports an economy that relies on water towers for hydroelectricity, agriculture, water supply, horticulture, and tourism. The Union Territory J&K is rich in biological, sociocultural, and ecological diversity. Jammu & Kashmir's mountains are its pride and necessity. The region's economy relies on natural resources and climate. The region's climate change concerns include floods, landslides, human health, biodiversity, droughts, endangered species, food security, agriculture, and livelihood. Global climate change may cause temperature rise, floods, wildfires, intense rainfall, snowstorms, windstorms, hailstorms, landslides, floods, and diseases. Climate change threatens regional agriculture and horticulture. It impacts regional water resources, ecosystems, forests, tourism, species variety, wildlife, and livelihood. Temperature, precipitation, humidity, and cold waves affect agriculture. Reduced rainfall hurt rain-fed agriculture most. Due to less snowfall, horticultural crops produce less. Human health is affected by climate change. It also affects global forest vegetation patterns, distribution, structure, and ecology. Recent years have seen Anantnag, Pulwama, Kulgam, Shopian, Baramulla, Bandipora, and Budgam convert more paddy land into rain-fed or dry land. According to Climate Change (2014), apple farming has increased while production per hectare has decreased. Climate change will affect the hydrological cycle through evapotranspiration, fresh water shortages, and snow cover loss. Climate change (INCCA) is crucial to regional tourism. Sustainable development in the face of climate change requires a balance between sustainable economy and sustainable environment by creating sustainable livelihoods. Table 1 shows natural disaster-related deaths.

Table 1: Analysis of Natural Disasters and their impact on human life

Year	Earthquake		Flood		Avalanche		Landslide		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
1985	3000	_	_	_	_	_	_	_	3000	_
1995		_	_	_	150	_	_	_	150	_
2005	80000	106300	_	_	_	_	_	_	80000	106300
2014	_	_	320	_	_	_	50		370	_
2017	_	_	_	_	20	_	_	_	20	_
Total	**110000**	**106300**	**320**	**_**	**170**	**_**	**50**	**_**	**110540**	**106300**

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Table 1 shows that earthquakes killed 110000 Jammu and Kashmir residents from 1885 to 2017. The figure includes Pakistan-occupied Kashmir deaths. Disaster earthquakes in Pakistan-occupied Kashmir and Indian-occupied Kashmir harmed 106300 people in recent decades. The 2014 flash flood killed 320 people, according to the table. There were 170 avalanche deaths and 50 landslide deaths. In 2005, 80000 people died and 106300 were injured in the worst earthquake.

Disaster resilience measures by government and non-government agencies

Following natural catastrophes, government and non-government organisations developed strategies to address the vulnerability of individuals and groups to social-economic situations. After the 2014 flood, Kashmiri student organizations from Delhi and other parts of India helped people cope with natural disasters. The national government has additionally sanctioned $720 million in several packages to Jammu and Kashmir for relief and rehabilitation of 2014 flash flood victims. After an avalanche in 2018, the State Disaster Relief Fund gave $5715 to the families of the dead and $172 to the injured. The central government has linked Disaster Risk Reduction to MGNREGA and Indira AwasYojana to help disadvantaged groups. The central government launched MGNREGA to produce jobs in water harvesting, flood control in water-logged areas, irrigation canal management, tree planting, and traditional water body rehabilitation. The government and nongovernment organizations have started self-help groups for women to empower them to generate micro-credit schemes, self-employment activities like carpet weaving, goat and sheep rearing, and other activities to boost the region's socio-economic development and disaster resilience. The Jammu and Kashmir government provides farmers with high-quality seeds, fertilizers, and water management facilities to boost agricultural growth to 4% and boost socioeconomic development.

CONCLUSION

This study covered the effects of natural disaster on Jammu and Kashmir residents. Time is needed to strengthen the effective disaster risk reduction and management system, enhance the early warning system by nodal agencies like the Indian meteorological department, and strengthen infrastructural facilities like schools, roads, buildings, and bridges. Infrastructure should be built according to geological and civil engineering criteria to minimize damage from floods and earthquakes. The report recommends a local train group to rescue catastrophe victims, offer first aid by understanding evacuation routes, and communicate for relief before outside help arrives. The studyemphasize the need to mitigate demographic vulnerabilities through community development programs for socioeconomic development. To protect residents, the government should create a disaster cycle of preparedness, response, reconstruction, and mitigation. The government should develop sustainable measures to strengthen communities by considering natural catastrophe threats. In-depth research is recommended to guarantee regional natural catastrophe resilience measures are addressed.

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