

Climate Change, Seasonality and Job Security in Tourism Sector

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Abstract

Original Research Article

Climate change is reshaping tourism in mountain regions by altering snowfall patterns, increasing extreme weather events, disrupting transport access and weakening the reliability of seasonal livelihoods. This study examines the relationship between climate change, tourism seasonality and job security in Himachal Pradesh's tourism sector. The study analyses how changing snowfall, heat stress, flash floods, landslides, Glacial Lake Outburst Floods (GLOFs), water stress and disaster risk affect tourism businesses, seasonal workers, women, tribal communities, migrant workers, artisans and local tourism operators. The study uses a qualitative research design relying on secondary sources, policy documents, statistical data and thematic analysis. The study argues that tourism employment in Himachal Pradesh is vulnerable not only because climate events disrupt tourist flows, but also because much tourism work is seasonal, informal and unevenly protected. Businesses have responded by diversifying into wellness retreats, adventure activities, cultural tourism, eco-friendly practices, online marketing and off-season packages, while workers increasingly rely on skill diversification, non-winter tourism activities, handicrafts, agriculture, hospitality and public livelihood schemes. However, these adaptations remain uneven and require stronger policy support. It concludes that climate-resilient tourism in Himachal Pradesh must combine year-round tourism planning, disaster preparedness, worker protection, women's enterprise support, tribal livelihood strategies and climate-sensitive infrastructure. Job security in the tourism sector should therefore be understood as a central component of climate adaptation.

Keywords: Climate change; tourism employment; seasonality; job security; Himachal Pradesh; mountain tourism.

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1. INTRODUCTION

Tourism in Himachal Pradesh is closely connected to climate. The attractiveness of the state as a mountain destination depends on landscapes, snow, forests, rivers, pilgrimage circuits, adventure routes, cultural settings, road access and seasonal weather. These climatic and ecological conditions shape when tourists travel, where they go, what activities they choose and how local workers and businesses earn income. Tourism therefore operates as a climate-sensitive livelihood system. When snowfall becomes unreliable, when roads are blocked by landslides, when extreme rainfall creates safety risks or when water scarcity affects tourist facilities, the impact is not limited to visitor experience. It also affects employment, business continuity, household income and the security of workers who depend on tourism.

Climate change has become a major challenge for tourism geographies across the world. Extreme rainfall, flooding, drought, heat waves, storms, wildfires, changing snow cover and rising travel costs are altering

tourist flows in both time and space (Gössling & Scott, 2024). Mountain destinations are especially sensitive because winter tourism, adventure tourism, trekking, road travel and high-altitude tourism depend heavily on predictable weather and safe access. Himachal Pradesh reflects this vulnerability. The state's tourism economy is linked to winter destinations, adventure circuits, pilgrimage routes, cultural tourism and rural livelihoods, all of which can be affected by climate variability.

The concern of this study is not only that climate change affects tourism, but that it affects tourism workers unevenly. Tourism employment in Himachal Pradesh is often seasonal and informal. Many workers earn during peak seasons and face uncertainty during off-season periods. Hotels, restaurants, transport operators, guides, artisans, homestay owners, vendors, photographers and support workers depend on tourist flows that can be disrupted by changing snow seasons or extreme events. Women, tribal communities, migrant workers, seasonal workers and informal workers are especially exposed because they often have limited

access to savings, insurance, formal contracts or social protection.

The relationship between climate change and job security therefore requires a livelihood-centred analysis. A decline in snow tourism, a sudden flood event or repeated landslides can reduce tourist arrivals and create immediate income losses. At the same time, climate adaptation can also create new opportunities if tourism is diversified into year-round activities such as cultural tourism, wellness retreats, eco-tourism, trekking, camping, handicrafts, local food systems and community-based experiences. The central question is whether adaptation is planned in a way that improves job security or whether workers are left to manage climate risk individually.

This study examines how climate change, seasonality and job security interact in Himachal Pradesh's tourism sector. The study analyses climate-sensitive employment patterns, local business adaptation, seasonal worker transitions, disaster preparedness, women's and tribal livelihoods and the need for policy support to make tourism work more secure.

2. Research Problem and Objectives

The research problem addressed in this study is that climate change is destabilising tourism livelihoods in Himachal Pradesh while the sector remains heavily dependent on seasonal flows and informal work. Tourism generates income for local communities, but this income is vulnerable to climatic disruptions. Snowfall uncertainty affects winter tourism. Extreme rainfall, flash floods, landslides and GLOFs affect road access, tourist safety and destination image. Heat waves and changing temperatures affect outdoor work, tourist comfort and business operations. These risks are compounded by the fact that many tourism workers lack formal employment security.

The study has four objectives. First, it analyses how climate change affects tourism seasonality and visitor-dependent livelihoods in Himachal Pradesh. Second, it examines the adaptation strategies adopted by local businesses and workers in response to changing snowfall, climate variability and extreme events. Third, it discusses the specific livelihood implications for seasonal workers, women, tribal communities, artisans, migrant workers and tourism operators. Fourth, it identifies the policy measures needed to strengthen job security and climate resilience in the tourism sector.

3. METHODOLOGY

This study is based on a qualitative research design that relies entirely on secondary sources for data collection. Information was gathered from secondary sources, including reports, policy documents, statistical data and research studies published by governmental

bodies such as the Himachal Pradesh Tourism Department, the Ministry of Statistics and Programme Implementation (MoSPI) and the Ministry of Environment, Forest, and Climate Change (MoEFCC). In addition, data from reputable non-governmental institutions, including research organizations and international development agencies, were utilised to supplement the analysis. The data analysis primarily involved thematic analysis, in which key trends, patterns and linkages between tourism, construction, human development and climate change impacts were identified and critically examined. The reliance on multiple secondary sources ensures a comprehensive and multidimensional understanding of the issues, while maintaining the credibility and reliability of the findings.

4. Climate Change and the Restructuring of Mountain Tourism

Climate change is altering the basic conditions on which mountain tourism depends. Snowfall, rainfall, temperature, road access, water availability and disaster risk influence both tourist behaviour and destination management. In winter tourism destinations, snow reliability is especially important. When snow seasons become shorter or unpredictable, destinations that depend on skiing, snow activities and winter recreation face reduced visitor confidence. Many winter destinations are already affected by decreasing snowfall and shorter snow seasons, while some regions may experience more extreme snowfall events that create infrastructure and safety challenges (Gössling & Scott, 2024; Quante *et al.*, 2021; Tsiologianni *et al.*, 2023).

For Himachal Pradesh, this means that climate change is not a distant environmental issue. It directly influences the timing and stability of tourism income. Traditional winter tourism destinations cannot assume that snowfall will remain predictable. Lower-altitude winter tourism areas are particularly exposed because small changes in temperature and snow cover can affect the viability of snow-based activities. Higher-altitude areas may temporarily attract tourists seeking reliable snow, but this may also increase ecological and infrastructure pressure if not managed carefully. The tourism industry must therefore adapt to a changing geography of snow, safety and visitor demand.

The changing snowfall pattern is only one part of the climate challenge. Extreme rainfall, flash floods, landslides, droughts, heat waves, storms and wildfire risks also reshape tourism. Heavy rain can block roads, damage bridges, affect trekking routes and discourage travel. Flash floods can create sudden risks for riverside destinations, campsites, pilgrimage routes and adventure tourism activities. Landslides can damage transport corridors and isolate destinations. Heatwaves may alter tourist comfort and affect workers engaged in outdoor services. These risks can reduce tourist arrivals, increase cancellations, raise operational costs and undermine the income security of workers and small businesses.

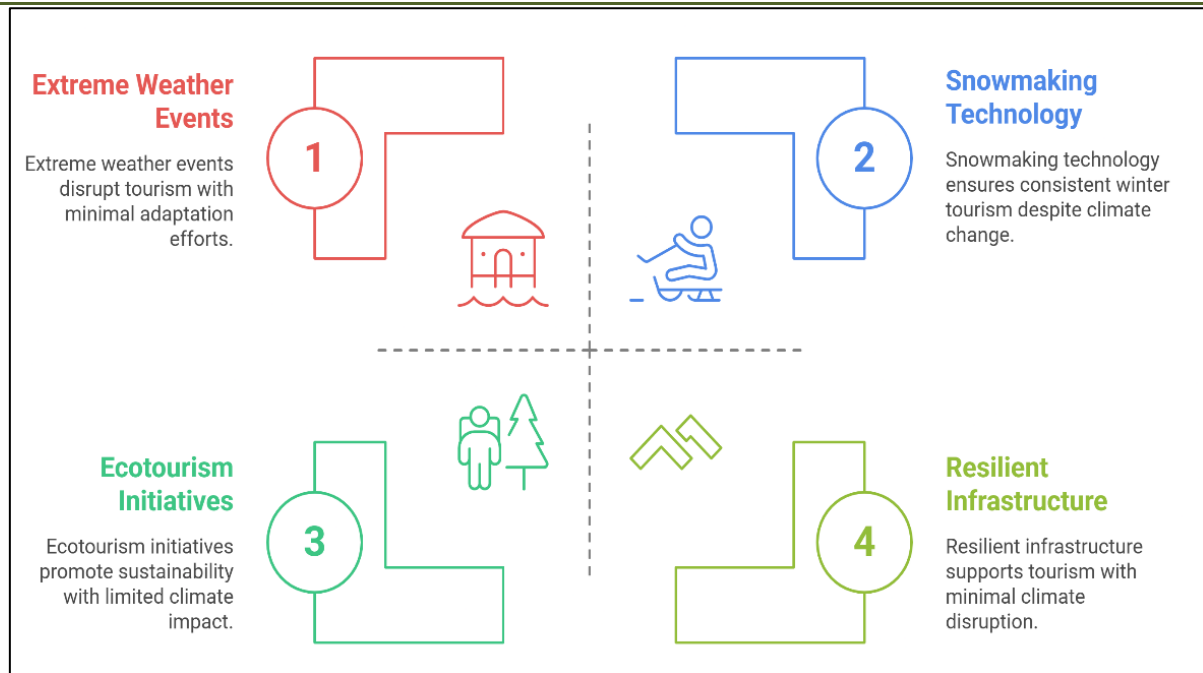


Figure 1: Balancing Tourism Adaptation and Climate Impact

Figure 1 shows the central policy tension that Himachal Pradesh must sustain tourism while responding to climate stress. This requires more than destination promotion. It requires climate-aware tourism planning, resilient infrastructure, diversified tourism products, emergency preparedness and environmental conservation. If tourism remains dependent on narrow seasonal windows and climate-sensitive attractions, its workers remain exposed to repeated income shocks. If tourism becomes more diversified and better prepared, it can support more stable livelihoods.

5. Seasonality and Job Security in Tourism

Tourism employment in Himachal Pradesh is shaped by seasonal peaks. Summer and winter seasons generate demand for hotels, restaurants, transport, guides, adventure activities, local products and support services. During these periods, local workers and migrant workers find opportunities in hospitality, food services, driving, guiding, handicrafts and tourism infrastructure. However, this seasonal structure also produces insecurity. When tourist arrivals decline because of climate disruptions, workers lose income quickly. Those without written contracts, savings or social protection are the most affected.

Climate change intensifies this insecurity by making seasons less predictable. A business that once depended on winter visitors may face shorter snow periods, reduced bookings or cancellations. A guide dependent on trekking or adventure tourism may lose work when extreme rainfall increases risks. A homestay owner may face losses when road access is disrupted. A small vendor may lose peak-season income when safety advisories discourage travel. Seasonal workers may have

to move between tourism, agriculture, construction and other informal jobs to maintain income.

The local businesses in Himachal Pradesh have responded to changing snowfall, urbanisation, pollution and temperature fluctuations by diversifying their tourism offerings. Hotels and resorts have introduced wellness retreats, adventure activities and cultural experiences that are less dependent on snowfall. Some businesses have adopted eco-friendly practices, including sustainable materials, waste minimisation and green tourism. Online platforms are used for marketing and sales, helping businesses offer off-season packages and attract tourists during non-peak periods. Businesses also upgrade heating and cooling systems to maintain tourist comfort across changing weather conditions and form partnerships with communities, NGOs and government agencies (Chaturvedi, 2023).

These responses show that adaptation is already taking place, but it is uneven. Larger hotels and established operators may be better able to diversify, market online, upgrade facilities and absorb short-term losses. Smaller businesses, informal vendors, guides, artisans and seasonal workers may lack capital and institutional support. If adaptation is left to individual market capacity, climate resilience will be unequal. Those with resources will adjust, while workers and small operators may remain vulnerable. Therefore, job security must become part of climate adaptation policy.

The shift toward year-round tourism is central to improving job security. If tourism remains concentrated in short peak seasons, employment will remain unstable. Year-round tourism does not mean increasing visitor pressure throughout the year without

limits. It means designing tourism activities that spread income more evenly while respecting ecological capacity. Cultural tourism, wellness tourism, local food experiences, craft markets, eco-tourism, pilgrimage, trekking, camping and community-based tourism can provide livelihood opportunities beyond snow-dependent winter tourism. Such diversification allows workers to use different skills across seasons rather than depending on one type of tourist flow.

6. Worker Adaptation and Livelihood Diversification

The changes in employment patterns among seasonal workers in Himachal Pradesh's tourist hotspots. As snowfall becomes less predictable, seasonal workers increasingly diversify their skills and take up roles in agriculture, construction, hospitality, handicrafts, ecotourism and sustainable tourism activities. Government schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the National Rural Livelihoods Mission (NRLM) provide alternative employment support during off-peak periods (Singh & Arun Kumar, 2024). These shifts show that adaptation is occurring at the worker level, not only at the business or policy level.

However, worker adaptation should not be romanticised. When workers move between multiple low-paid informal jobs, this may indicate resilience, but it may also indicate insecurity. A tourism worker who shifts to agriculture, construction, handicrafts or casual work during off-season periods may be managing risk without adequate institutional support. Skill diversification becomes meaningful only when it leads to better income, safer work and more predictable livelihood options. If workers are forced into fragmented work because tourism has become unreliable, adaptation remains incomplete.

Skill development is therefore essential. Workers need training that allows them to operate across different tourism activities and seasons. A guide may need skills in eco-tourism interpretation, disaster awareness, first aid, cultural storytelling, digital communication and visitor management. Homestay operators may need training in hospitality, sanitation, local food presentation, waste management, online booking and safety protocols. Artisans may require design support, digital marketing, product diversification and links to tourism markets. Drivers and transport workers may need training in climate-risk routes, emergency response and tourist safety. Such skills can reduce livelihood vulnerability by widening employment options.

The local businesses have formed partnerships with communities, NGOs and government agencies (Chaturvedi, 2023). This is important because adaptation requires collective support. Individual workers cannot manage climate risk alone. Community-level

associations, cooperatives, self-help groups, tourism clusters, hotel associations and guide unions can help coordinate training, share information, negotiate support and respond to crises. Such institutions can also help link workers with government schemes and climate-adaptation programmes.

Tourism job security should therefore be understood as a system involving workers, employers, communities, public agencies and visitors. Workers need skills and protection. Employers need incentives to diversify responsibly and maintain decent work conditions. Communities need control over tourism development. Public agencies need to provide infrastructure, training, safety information and social protection. Visitors need reliable information and responsible behaviour. Without this system, climate adaptation remains fragmented.

7. Women, Tribal Communities and Climate-Sensitive Tourism Livelihoods

Women and tribal communities occupy an important position in Himachal Pradesh's tourism economy. The women participate through homestays, restaurants, small shops, handicrafts, handlooms and other enterprises. Their involvement can increase income, autonomy and community visibility. However, women's tourism work is often informal and concentrated in service activities that may not provide stable income or social security. Climate disruptions can therefore affect women directly through reduced tourism income and indirectly through increased household responsibilities during crises.

The study identifies initiatives that support women and tribal communities in securing livelihoods within the climate tourism economy. The Tribal Sub-Plan focuses on socio-economic development through funding for infrastructure, education, healthcare and employment opportunities for tribal populations. The Mahila Shakti Kendra scheme supports rural women through community participation and skill development. The National Rural Livelihood Mission promotes self-employment through Self-Help Groups, financial assistance and training. The Integrated Tribal Development Project emphasises holistic development in tribal areas, including infrastructure, education, healthcare and livelihood sectors (Kumar & Rajender Singh, 2022).

These schemes are important because climate-resilient tourism requires targeted support for groups whose livelihoods are vulnerable. Women's participation in tourism can be strengthened through women-led homestays, craft clusters, local food enterprises, eco-friendly product lines, cultural interpretation and digital marketing. Tribal communities can benefit from eco-tourism, cultural tourism, adventure activities and handicrafts if tourism is community-led and culturally respectful. However, without safeguards,

tourism may commodify culture, increase land pressure or allow external actors to capture benefits. Climate-resilient tourism must therefore combine livelihood support with cultural and ecological protection.

The tribal women artisans have adopted adaptive income strategies in response to climate-induced decline in tourist flows. These strategies include diversification of product offerings, creation of eco-friendly goods, use of online marketing platforms, collaboration with NGOs and cooperatives, skill enhancement, improved product quality and use of natural dyes and recycled materials to appeal to eco-conscious consumers (INTACH, n.d.). This shows that women's adaptation is not passive. Women are actively responding to shifting markets and environmental concerns by changing products, practices and marketing strategies.

Yet these adaptive strategies need stronger institutional backing. Online marketing requires digital literacy, logistics support, product photography, pricing knowledge and access to reliable internet. Eco-friendly production requires material access, design training and market recognition. Cooperative support requires organisational capacity and fair revenue sharing. If women artisans and tourism entrepreneurs are expected to adapt without these supports, the burden of climate resilience falls on those who already face structural barriers. Policy support must therefore focus on reducing the cost of adaptation for women and tribal communities.

8. Extreme Events, Tourism Operators and Preparedness

Climate change affects tourism not only through gradual seasonal shifts but also through sudden extreme events. The impact of cloudbursts, flash floods, GLOFs and landslides on Himachal Pradesh's tourism infrastructure and safety. Extreme events disrupt roads, damage bridges, affect hotels and campsites, threaten tourists and create uncertainty for operators. For tourism workers and businesses, such events can result in cancellations, loss of income, repair costs and reputational damage to destinations.

Himachal Pradesh has taken steps to enhance resilience against extreme weather events. In collaboration with the French Development Agency, the state launched a Disaster Risk Reduction and Preparedness Program. This initiative emphasises early warning systems for landslides, floods, cloudbursts and GLOFs, along with Disaster Risk Reduction and nature-based solutions. Efforts include stabilising landslide-prone areas, upgrading roads and bridges, developing flood forecasting networks, strengthening disaster governance and improving institutional capacities. A Special Disaster Response Force was also set up in Kangra to provide rapid responses during disaster events (Himbu Mail, 2023).

Tourism operators have also adopted emergency preparedness measures following GLOF and flash flood incidents. Early warning systems help operators receive alerts and take preventive actions, including tourist evacuation. Operators have developed emergency response plans, evacuation routes, emergency contacts and safety procedures. Training sessions and drills cover first aid and disaster response protocols. Tourism operators also collaborate with local authorities and disaster management agencies during crises. Infrastructure upgrades include reinforcing buildings, improving drainage systems and installing backup power supplies to improve resilience (Jokta Academy, 2024).

These measures are directly linked to job security. When destinations are better prepared, tourism businesses can recover faster and workers face less prolonged income disruption. Emergency preparedness protects tourists, but it also protects livelihoods. A destination that can provide accurate warnings, safe evacuation, reliable communication and rapid restoration of services is more likely to maintain visitor confidence. Conversely, repeated unmanaged disasters can damage the destination's image and reduce future tourist demand.

GLOFs require particular attention in the Himalayan context. Structural flood defence measures such as lake-level controls, channel modifications and flood defence infrastructure can reduce physical damage from GLOFs (Shah & Ishtiaque, 2025). However, technical measures must be linked with community preparedness and tourism planning. Tourism activities near rivers, glacial valleys and flood-prone areas should include risk mapping, visitor restrictions during high-risk periods, trained local responders and clear evacuation protocols. Adventure tourism, camping, trekking and riverside tourism must be assessed through climate-risk lenses before promotion.

9. Environmental Conservation and Tourism Continuity

The continuity of tourism employment depends on the health of natural and cultural resources. If destinations suffer from pollution, waste accumulation, water scarcity, biodiversity loss or landscape degradation, their long-term attractiveness declines. The environmental conservation initiatives are part of Himachal Pradesh's strategy to sustain tourism amid climate challenges. Biodiversity conservation, protected areas, wildlife sanctuaries, improved waste management and policy support for lesser-known destinations are all relevant to tourism resilience (Mahajan, 2023; Government of Himachal Pradesh, 2019).

Tourism workers are often discussed as beneficiaries of tourism, but they are also dependent on destination quality. A guide depends on safe trails and attractive landscapes. A homestay owner depends on clean surroundings, water availability and visitor

confidence. A vendor depends on tourist footfall. A craft producer depends on the destination's ability to attract visitors. Environmental degradation therefore becomes an employment issue. When tourism damages the ecological base, it undermines the livelihoods it creates.

This is why sustainable tourism practices matter for job security. Eco-friendly accommodation, waste reduction, water conservation, renewable energy, responsible visitor behaviour and biodiversity protection are not only environmental measures. They protect the destination's long-term economic viability. Climate-resilient tourism must therefore integrate environmental management with employment planning. Policies that promote tourism without environmental safeguards may generate short-term jobs but increase long-term vulnerability.

The Himachal Pradesh Tourism Policy 2019 emphasises sustainable tourism development, lesser-known destinations and the integration of climate adaptation strategies into tourism planning (Government of Himachal Pradesh, 2019). The State Strategy and Action Plan on Climate Change also identifies measures related to energy efficiency, renewable energy and climate action (Department of Environment, Science & Technology, Government of Himachal Pradesh, 2012). These policy directions are important, but their effectiveness depends on implementation at the destination level.

10. Job Security as Climate Adaptation

The analysis suggests that job security should be treated as a core component of climate adaptation in Himachal Pradesh's tourism sector. Climate adaptation is often discussed in terms of infrastructure, early warning systems, environmental conservation and policy planning. These are necessary, but they are incomplete if workers remain insecure. A destination may have better roads and warning systems, but if guides, vendors, artisans, hotel workers, transport workers and homestay operators lack stable income and social protection, climate resilience remains partial.

Tourism workers face multiple layers of vulnerability. They depend on visitor flows, visitor flows depend on climate stability, road access, safety and destination image. Workers also depend on employers, markets, seasonal demand and public support. A climate event can disrupt all these links at once. For example, a flash flood may damage roads, reduce bookings, affect hotel occupancy, reduce demand for transport, stop guiding activity and weaken artisan sales. Workers with formal contracts or savings may recover more easily,

while informal and seasonal workers may face immediate income loss.

The adaptation is already occurring through business diversification, eco-friendly practices, online marketing, worker skill changes, alternative employment, women's enterprise strategies and disaster preparedness. However, these adaptations need to be organised into a coherent tourism employment strategy. Such a strategy should recognise workers not merely as labour inputs but as central stakeholders in climate-resilient tourism. Their knowledge of local routes, seasons, visitor behaviour, risks and community needs can improve destination planning.

A climate-resilient job-security framework would include five elements. First, tourism should be diversified into year-round activities to reduce dependence on snow and peak seasons. Second, workers should receive multi-skill training that allows movement across tourism activities and related livelihoods. Third, informal workers should be linked with social protection, insurance, emergency relief and registration systems. Fourth, women and tribal communities should receive targeted support for enterprise development, digital marketing and community-based tourism. Fifth, tourism operators should be integrated into disaster preparedness systems through training, communication, evacuation planning and infrastructure upgrades.

The concept of job security must also be expanded. It should not mean only permanent employment in formal establishments. In tourism, many livelihoods are self-employed, family-based, seasonal or community-based. Job security in this context means predictable income opportunities, access to alternative work during disruption, safety at work, protection from sudden shocks, fair participation in tourism benefits and the ability to adapt without falling into debt or distress migration. This broader understanding is more appropriate for mountain tourism economies.

There is also a need to recognise that climate adaptation can create new inequalities if not carefully planned. Businesses with capital can upgrade infrastructure, market online, diversify products and recover after disasters. Small operators may struggle. Workers with education and digital skills may shift into new tourism roles, while others may remain in low-paid informal work. Women and tribal artisans may create eco-friendly products, but without market access they may not capture value. Therefore, adaptation policy must include redistributive support so that resilience does not become limited to better-resourced actors.



Figure 2: Impact of Climate Change on Labour

Figure 2 shows labour dimension of climate change is especially important for tourism because the sector relies on outdoor, mobile, seasonal and service-based work. The study identifies women and youth as groups particularly exposed to climate impacts in tourism and construction, especially in regions where informal and outdoor labour is common. Heat stress, extreme weather, physical work demands and lack of technological support can worsen working conditions for vulnerable groups (Lundgren *et al.*, 2013). Tourism workers also face wider challenges such as low pay, discrimination and seasonality, which can be intensified by climate disruptions (Aynalem *et al.*, 2016). Thus, the climate crisis affects labour not only by reducing work opportunities but also by making available work more hazardous and uncertain.

This point has major implications for tourism planning. If a destination experiences higher temperatures, workers in guiding, transport, outdoor vending, trekking support, food services and maintenance may face health risks. If rainfall becomes more intense, workers may face unsafe travel, fewer workdays and greater exposure to landslides or flooding. If disasters interrupt tourist seasons, informal workers may lose income without compensation. If tourism shifts geographically toward higher-altitude areas in search of snow reliability, labour demand may also shift, forcing workers either to migrate seasonally or to adapt to new skills. Job security therefore depends on anticipating how climate changes the geography and timing of work.

A worker-centred tourism adaptation model would begin by identifying which groups are most

exposed to income loss, health risk and occupational insecurity. Seasonal guides, drivers, porters, food vendors, small shopkeepers, hotel support staff, homestay workers, artisans, women's groups and migrant workers may experience climate disruptions differently. Guides and adventure workers may lose income during unsafe weather. Drivers may face dangerous routes and road closures. Homestay workers may experience cancellations but still bear maintenance costs. Artisans may lose sales when tourist footfall falls. Women may face the double burden of reduced income and increased unpaid care work during climate emergencies. Migrant workers may lack local support networks during crises.

The study also highlights the importance of access to health and emergency services during extreme events. Disruptions in water, sanitation, roads and medical access can create public health risks, especially for displaced or stranded populations. Investments in landslide-resistant roads and bridges, early warning systems, mobile medical units and community training in first aid and emergency response can improve resilience during disasters (Sphere India, 2023). These measures are relevant to tourism because tourist destinations often include remote areas where emergency response is difficult. Protecting workers and visitors requires basic health and safety infrastructure, not only tourism promotion.

A second issue concerns the relationship between adaptation and mobility. Tourism workers may become increasingly mobile as climate change alters the seasonality of work. Some may move from winter

tourism to summer activities, from hotels to agriculture, from guiding to construction or from local selling to online markets. Such mobility can be adaptive, but it can also weaken stability if workers lack contracts, housing, insurance or access to schemes. Migrant workers are particularly vulnerable because their livelihoods depend on temporary work and their access to local welfare systems may be limited. Climate-resilient tourism policy should therefore recognise mobility as part of the labour system and design portable protections for workers.

Third, the study suggests that climate adaptation must be connected to destination reputation. Tourists are increasingly sensitive to safety, road conditions, extreme weather and environmental quality. When destinations are seen as unsafe or poorly managed, tourist confidence declines and workers lose income. Disaster preparedness, accurate communication, emergency protocols, clean surroundings and visible environmental management can therefore protect employment indirectly by maintaining destination trust. Conversely, poor crisis management can have long-term livelihood impacts even after physical infrastructure is repaired.

Fourth, tourism enterprises need support to maintain workers during climate disruptions. Small hotels, homestays, restaurants and local operators may be unable to pay workers when bookings collapse. Emergency credit, temporary wage support, insurance products and recovery grants can help businesses retain workers after disasters. Without such support, climate events may produce cycles of layoffs, distress migration, debt and business closure. Since tourism is a key livelihood sector in Himachal Pradesh, recovery planning should include employment continuity measures.

Finally, job security must be linked with responsible tourism behaviour. Visitors influence waste generation, water demand, transport congestion, risk exposure and pressure on fragile sites. Responsible visitor behaviour can reduce environmental stress and improve safety, while irresponsible behaviour can increase burdens on local workers and emergency services. Tourism communication should therefore include guidance on waste, water use, weather risk, route safety, local culture and emergency protocols. Such communication helps protect both destinations and those whose livelihoods depend on them.

11. Recommendations

First, Himachal Pradesh should integrate job security into tourism climate adaptation planning. Tourism policies should assess how climate risks affect workers, not only destinations and infrastructure. Worker vulnerability assessments should be included in tourism master plans and district-level climate action. Second, the state should promote year-round tourism activities that reduce dependence on snow-based and peak-season tourism. Wellness tourism, cultural tourism, eco-

tourism, local food experiences, handicrafts, pilgrimage, trekking, camping and community-based tourism can support more stable income if planned within ecological limits. Third, skill development programmes should be expanded for tourism workers. Training should include hospitality, digital marketing, eco-tourism interpretation, first aid, disaster response, waste management, local guiding, language skills and enterprise management. Such training should be accessible to women, youth, tribal communities, migrant workers and informal workers. Fourth, women's tourism enterprises should receive targeted support. Women-led homestays, craft groups, local food enterprises, eco-friendly product lines and digital marketing platforms can strengthen household income and community resilience. Support should include credit, training, design assistance, market linkages and cooperative structures. Fifth, tribal tourism development should remain community-centred. Cultural tourism, eco-tourism and adventure tourism in tribal regions should be based on community consent, cultural safeguards, local control over interpretation and fair benefit-sharing. Tourism should support cultural continuity rather than extract cultural value. Sixth, informal and seasonal tourism workers should be linked with social protection. Worker registration, emergency relief mechanisms, health insurance, accident coverage, wage protection and access to public employment schemes can reduce vulnerability during climate disruptions. Seventh, tourism operators should be integrated into disaster preparedness systems. Hotels, homestays, guides, transport providers, campsites and adventure operators should have access to early warnings, evacuation protocols, emergency contacts, training drills and coordination with disaster management agencies. Eighth, destination-level environmental management should be strengthened. Waste management, water conservation, renewable energy, biodiversity protection and responsible visitor behaviour should be treated as livelihood protection measures because environmental degradation directly threatens tourism employment. Ninth, tourism recovery planning should include livelihood continuity. After landslides, flash floods, or disrupted seasons, recovery is often measured through road reopening, hotel repairs or restoration of visitor movement. These are necessary, but they do not fully capture the impact on workers. A guide who has lost bookings, a woman artisan who has lost market access, a driver whose vehicle remains idle or a homestay owner who has taken loans for repairs all experience recovery differently. District administrations and tourism departments should therefore include livelihood-loss assessment in post-disaster planning. Tenth, digital systems should be used to support both tourism promotion and worker resilience. Online platforms can help businesses attract tourists during off-season periods, but they can also provide weather alerts, road advisories, emergency contacts, training modules and market access for artisans. Digital marketing should not be limited to established hotels or larger operators. Women's groups, homestays, guides, local food

enterprises and craft producers should also be supported in using digital tools.

11.1 Policy Pathway for Climate-Secure Tourism Employment

A climate-secure tourism employment pathway for Himachal Pradesh can be organised around three phases: preparedness, continuity and transformation. Preparedness refers to actions taken before climate disruption occurs. This includes worker registration, risk mapping, early warning access, first-aid training, insurance awareness, skill development and emergency planning. Preparedness is essential because climate events often unfold quickly and workers in informal tourism roles may not receive timely institutional support. If workers and operators know evacuation routes, emergency contacts, alternative income schemes and safety protocols in advance, the livelihood shock of disasters can be reduced. Continuity refers to measures that help workers and businesses maintain income during and immediately after disruption. This includes temporary employment support, access to public livelihood schemes, emergency credit, cancellation-management support, transport restoration, market access for local products and rapid communication on destination reopening. Continuity measures are important because tourism workers often lose income before physical damage is fully visible. Even rumours of unsafe conditions can reduce bookings. A climate-secure tourism system should therefore provide reliable information and short-term support so that workers are not forced into distress borrowing or migration.

Transformation refers to longer-term changes in tourism systems so that livelihoods become less vulnerable to future climate events. This includes diversification into non-snow activities, community-based tourism, women-led enterprises, eco-friendly products, resilient infrastructure, responsible visitor management and stronger social protection. Transformation is the most difficult phase because it requires changes in policy, investment, skills and behaviour. However, without transformation, tourism will remain trapped in repeated cycles of disruption and recovery.

These three phases are interlinked. Preparedness without continuity may protect lives but not livelihoods. Continuity without transformation may provide temporary relief but leave workers exposed to the next event. Transformation without preparedness may produce long-term plans but fail during immediate crises. A strong climate-resilient tourism policy must therefore combine all three.

11.2 Implications for Tourism Governance

The governance of tourism employment must become more integrated. Tourism departments cannot address job security alone because employment resilience depends on transport, disaster management, rural development, skill development, women and child

development, tribal welfare, environment, public works and local government. For example, a homestay cluster may require tourism registration, road maintenance, waste collection, water supply, digital connectivity, women's credit support and disaster preparedness. If these systems do not work together, local tourism livelihoods remain fragile.

Local institutions are particularly important. Panchayats, self-help groups, local tourism committees, guide associations, hotel associations, women's groups and cooperatives can help identify vulnerable workers, communicate risks, support training and manage tourism at the destination level. Climate adaptation becomes more effective when local institutions participate because they understand seasonal patterns, road conditions, visitor behaviour and community needs. Top-down planning may miss these details.

At the same time, local communities need resources and authority. Asking communities to manage tourism without financial support, technical training or decision-making power can shift responsibility without enabling action. Community-based tourism should therefore include real participation in planning, revenue sharing, environmental monitoring and crisis response. This is especially important for women and tribal communities whose knowledge and labour support tourism but whose decision-making power may remain limited.

The main contribution of this study is to connect climate change with job security in Himachal Pradesh's tourism sector. Much discussion on climate-resilient tourism focuses on destinations, infrastructure or environmental conservation. This study shows that the labour question is equally central. Tourism cannot be considered resilient if the workers who sustain it remain insecure. Guides, artisans, drivers, homestay operators, hotel workers, vendors, women entrepreneurs, tribal communities and migrant workers are not secondary to the tourism economy, they are its everyday foundation.

The seasonality is not only an economic pattern but a climate vulnerability. When tourism income is concentrated in short seasons, any climate disruption can create immediate livelihood stress. Year-round tourism, skill diversification and alternative income opportunities are therefore not merely development tools, they are adaptation tools. Similarly, disaster preparedness is not only about saving infrastructure and tourists, it is also about protecting employment continuity.

Finally, the study highlights that adaptation should not become individualised. Workers and small businesses are already adapting through multiple strategies, but individual adaptation has limits. Without policy support, adaptation can become a burden placed on those least able to bear it. A just tourism adaptation strategy must therefore distribute support toward

vulnerable workers, women's enterprises, tribal communities, informal workers and small operators.

12. CONCLUSION

Climate change is reshaping the tourism economy of Himachal Pradesh by altering snowfall, increasing extreme weather risks, affecting road access and destabilising seasonal employment. The tourism sector cannot respond to these changes through promotion and infrastructure alone. It requires a livelihood-centred adaptation strategy that protects workers, supports businesses, strengthens communities and conserves the environmental resources on which tourism depends.

The local businesses and workers are already adapting. Businesses diversify into wellness, adventure, cultural experiences, eco-friendly practices, online marketing and off-season packages. Workers move across tourism, agriculture, construction, handicrafts, hospitality and public livelihood schemes. Women and tribal artisans develop eco-friendly products and use online platforms. Tourism operators adopt emergency preparedness measures. These responses demonstrate resilience, but they also reveal the uneven burden of adaptation.

The job security must be recognised as climate adaptation. In Himachal Pradesh's tourism sector, climate resilience depends not only on roads, warning systems and policies, but also on whether workers can maintain income, safety, dignity and adaptive capacity under changing climate conditions. A tourism model that creates year-round opportunities, protects informal workers, supports women and tribal communities, strengthens disaster preparedness and safeguards the environment can make Himachal Pradesh's tourism economy more resilient. Without such measures, climate change will continue to convert tourism seasonality into livelihood insecurity.

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