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CHAPTER VI

At the Crossroads: Will We Choose a Sustainable Future? Case Studies from Himachal Pradesh, Uttarakhand and Wayanad

Dr. Niraj Kumar Singh
Associate Professor, University of Delhi

Abstract:

As humanity faces mounting environmental challenges and diminishing resources, sustainability has emerged as a critical global issue. Driven by the United Nations' Sustainable Development Goals (SDGs), sustainability seeks to reconcile economic growth, environmental protection, and social equity. Climate change, resource depletion, and biodiversity loss underscore the need for sustainable development practices. Recent natural disasters in Himachal Pradesh, Uttarakhand, and Wayanad highlight the consequences of neglecting environmental concerns in development projects, emphasizing the urgent need for disaster management strategies and integrated, eco-friendly planning. The balance between economic growth and environmental stewardship is crucial to ensuring a livable planet and prosperous future. Sustainable development must involve adopting green technologies, reducing carbon emissions, and protecting natural habitats. Long-term economic, social, and environmental health depends on comprehensive approaches, responsible decision-making, and public awareness, shaping a sustainable and equitable future for generations to come.

Keywords: Sustainability, United Nations Sustainable Development Goals (SDGs), Biodiversity loss, Disaster management, Urbanization

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Introduction:

As humanity grapples with unprecedented environmental challenges and dwindling resources, sustainability stands at a pivotal crossroads. The urgency to reconcile economic growth, environmental protection, and social equity has never been more pressing. Once a niche concern, sustainability was propelled to the forefront of global discourse by the United Nations' Sustainable Development Goals (SDGs). Adopted in September 2015 as part of the 2030 Agenda for Sustainable Development, these goals aim to end poverty, protect the planet, and ensure prosperity for all. Now, faced with the stark realities of climate change,

resource depletion, and biodiversity loss, sustainability has become central to global decision-making. Recent landslides and cloudbursts especially in Himachal Pradesh, Uttarakhand, and Wayanad in Kerala underscore the urgent need for comprehensive disaster management strategies and sustainable development practices. Addressing the root causes, such as climate change and environmental degradation, is crucial to mitigate these natural disasters' frequency and severity. Sustainability isn't just an environmental concern but a comprehensive approach that includes economic, social, and environmental dimensions. In a rapidly changing climate, prioritizing sustainability is essential to ensure a liveable planet, equitable societies, and robust economies. The decisions made today will determine the health and prosperity of future generations.

Historically, economic growth has often prioritized short-term gains over long-term environmental stewardship. Industries and urbanization have driven significant economic advancement but frequently at the cost of ecological degradation. The challenge now is to move towards an economic model that integrates environmental sustainability. This means adopting green technologies, reducing carbon footprints, and ensures that economic activities do not exhaust or irreversibly damage natural resources.

Economic growth is vital for societal development. Infrastructural projects, industrial expansion, and urban development create jobs, reduce unemployment, and boost the economy. They also significantly improve living standards, providing better housing, healthcare, and educational facilities. Technological advancements and innovations lead to greater efficiency and new solutions for various challenges. Improved infrastructure enhances transportation and connectivity, facilitating trade, commerce, and mobility. Urbanization triggers the development of cities and towns, offering better amenities, housing, and opportunities, attracting investment, and fostering growth. Access to energy is crucial for these developmental goals. Building power plants and energy infrastructure ensures regular electricity supply, the backbone of industrial and residential needs. Economic opportunities and resource access significantly alleviate poverty, while investment in social infrastructure, such as schools and hospitals, enhances education and healthcare access, enriching human capital.

However, this developmental model has taken a toll on our environment. Conserving natural habitats and biodiversity is crucial for maintaining ecological balance and supporting life on Earth. Reducing greenhouse gas emissions through sustainable practices is vital for

combating global warming and its adverse effects. Sustainable management of natural resources ensures their availability for future generations, preventing depletion and degradation. Pollution of soil, water, and air due to indiscriminate development severely impacts public health and quality of life. It is our duty to protect these vital components of the environment through responsible action and stringent environmental regulations.

Sustainable development is essential. Investments in renewable energy sources, like solar and wind, provide sustainable alternatives to fossil fuels, reducing environmental impact. Promoting eco-friendly industries, especially in ecologically fragile zones, fosters economic growth while preserving the environment and creating a green economy. Sustainability ensures long-term economic and environmental health, preventing the negative consequences of a short-sighted growth model. We are at a crossroads, negotiating with the dominant developmental discourse for a better, liveable future. This balancing act requires integrated planning, thorough environmental impact assessments before embarking on development projects, and identifying and mitigating potential environmental hazards. Sustainable urban planning is needed like designing cities with green spaces, efficient public transportation, and eco-friendly buildings to balance development and environmental concerns. Stringent environmental laws and their enforcement are a must to protect natural habitats and promote sustainable practices. Incentivizing green practices in business and adopting green technologies will drive sustainable development. Public awareness and engagement are crucial. Promoting awareness about the importance of sustainability and the environmental impact of development will foster responsible behaviour and policy support.

Recent disasters in Himachal Pradesh, Uttarakhand, and Wayanad highlight the consequences of ignoring environmental concerns. These ecologically fragile regions have suffered due to development projects that undermined environmental impact assessments and ignored warnings from local communities and experts. The severe landslides and cloudbursts in Himachal Pradesh during the 2023 monsoon season devastated Kullu, Shimla, Mandi, and other districts, causing massive economic disruption, loss of life and property, and displacement. Uttarakhand is witnessing similar devastations, with erratic development projects, widening of the Char Dham Road Project, and intense infrastructural activities changing the region's contour. The Kedarnath catastrophe in 2013 is a stark reminder of nature's fury. This year, landslides and cloudbursts have occurred again. Most recently, the Wayanad region of Kerala saw over 300 lives lost, with over 200 still missing.

Himachal Pradesh

In recent years, the Himalayan state of Himachal Pradesh has been severely impacted by climatic catastrophes, particularly during the monsoon season. The region witnessed devastating events such as landslides, cloudbursts, and flash floods, leading to widespread destruction of life and property. These disasters underscore the growing vulnerability of the Himalayan region to extreme weather events, which are likely exacerbated by climate change, making disaster preparedness and response increasingly critical. Developmental projects in the Himalayan region have often been linked to these recurrent climatic catastrophes. Factors such as deforestation, loss of vegetation, hydroelectric projects, unplanned urbanization, and road construction contribute to the increasing risk of landslides and other disasters. While development is essential for economic growth, the fragile nature of the Himalayas means that poorly planned or executed projects can significantly increase the likelihood of natural disasters. Therefore, sustainable development practices that consider the unique environmental sensitivities of the region are crucial in mitigating these risks.

Between June and mid-August, Himachal Pradesh witnessed over 50 cloudbursts and flash floods, resulting in widespread destruction, particularly in the districts of Mandi, Kinnaur, and Shimla. The devastation caused by these events included extensive loss of life and infrastructure. Rescue operations, involving multiple agencies such as the army and the National Disaster Response Force, have been ongoing to search for missing persons and provide relief to affected communities. However, the continued heavy rainfall has made these operations extremely challenging. By mid-August, over 100 roads were closed, and vital services like power and water supply were severely disrupted, leading to economic losses exceeding Rs. 1000 crore. A combination of geological, climatic, and human factors causes landslides in the Himalayan region. The Himalayas, one of the world's youngest mountain ranges, are still tectonically active, making the region geographically unstable and prone to landslides. The steep slopes of the Himalayas, coupled with intense rainfall during the monsoon season, contribute to the frequent occurrence of landslides. Additionally, snow melting in the upper reaches further saturates the soil, increasing the risk of landslides.

Human activities, such as deforestation for agriculture and timber, infrastructure development, and urbanization, further destabilize the region. Construction activities, including developmental works and mining, significantly increase the probability of landslides. The region is also seismically active due to ongoing tectonic activity, which can

trigger landslides. During the rainy season, numerous rivers and streams in the Himalayas erode the base of slopes, undermining their stability and leading to landslides. Climate change has also led to more extreme weather patterns, including heavier and torrential rainfall and rapid snowmelt, contributing to the increased frequency of landslides. These human activities have not only caused direct environmental degradation but also have far-reaching impacts on the climate and natural processes in the Himalayas. The consequences include an increased frequency and intensity of natural disasters, loss of biodiversity, and long-term damage to the livelihoods of communities that depend on the region's natural resources. Human activities have exacerbated the natural vulnerabilities of the Himalayan region, making it imperative for policymakers and developers to seek solutions and question some of the processes that have driven large infrastructural projects. The loss of vegetation and biodiversity has severely disrupted the region's natural equilibrium. Agricultural practices, such as slash-and-burn agriculture, have led to large-scale forest degradation, particularly in terms of soil erosion and increased carbon emissions. Overgrazing by livestock further reduces vegetation cover, leading to soil erosion and desertification. It also compresses the soil, reducing its ability to absorb water, which can result in more severe runoff and flooding.

Urbanization and infrastructural development have also had significant impacts on the region. Rapid and unplanned urbanization, including constructing roads, buildings, and dams, has altered the natural landscape. The frequent cutting of mountain slopes destabilizes the region, increasing the risk of landslides. Poorly designed drainage systems in urban and infrastructural projects often lead to waterlogging, exacerbating the impact of heavy rainfall and contributing to landslides and floods. The construction of large dams and hydroelectric projects has disturbed river ecosystems by restricting the natural flow of rivers, altering sediment transportation, affecting aquatic ecosystems, and potentially leading to downstream erosion. Mass tourism has further strained the fragile ecosystem of the Himalayas. The region's growing popularity as a tourist destination has led to the construction of hotels, roads, and other infrastructure in sensitive areas. The influx of tourists has put additional pressure on the ecosystem, disturbing the local environment and resulting in increased waste, pollution, and resource depletion. Climate change, induced by global warming, altered weather patterns, pollution, and mining activities, poses a significant threat to the pristine Himalayas.

In response to these challenges, the government of Himachal Pradesh, in collaboration with the central government of India, has implemented several action plans and strategies to address landslides and other disasters in the region. These initiatives aim to address both immediate disaster management needs and long-term prevention and mitigation. Some measures include early warning systems, infrastructure resilience, disaster management and preparedness, environmental protection and reforestation, zoning and land-use planning, rescue and relief operations, public awareness and community involvement. While focusing on immediate disaster response, these measures also aim at long-term mitigation and adaptation to reduce the frequency and impact of landslides in Himachal Pradesh. However, ongoing challenges such as rapid urbanization, climate change, and more vigorous enforcement of regulations require continuous efforts from both the government and local communities. Addressing landslides and other disasters in the Himalayan region, including Himachal Pradesh, involves significant sustainability challenges. These challenges arise from the complex interplay of environmental, social, and economic factors.

It is high time that all stakeholders come together to develop comprehensive plans and sustainable development models to mitigate the impact of natural disasters in the Himalayan region. The fragile ecosystem of the Himalayas is already under tremendous stress, and without a concerted effort to address these challenges, the region will continue to face devastating climatic catastrophes.

Uttarakhand

Uttarakhand has faced numerous climatic disasters in recent years. Heavy rainfalls, cloudbursts, landslides, and other ecological crises have dotted the length and breadth of the state. While these events are largely due to geographical, geological, and climatic factors, human activities have also significantly contributed in altering the landscape of the region. The region, part of the seismically active Himalayas, is characterized by steep slopes and young, fragile mountains, making it particularly prone to landslides, especially during the monsoon season. This vulnerability is worsened by extensive deforestation, which began during British rule for various purposes, as well as road and dam construction, other infrastructure projects, and unplanned rapid urbanization.

Like Himachal Pradesh, the fragile geology of the Himalayas has always been prone to erosion because the rocks are loosely bound and are easily destabilized by both natural and

human-induced disturbances. Steep slopes further increase the likelihood of landslides. Uttarakhand's hilly regions are particularly susceptible to concentrated rainfall during the monsoon season, leading to cloudbursts. Orographic lifting, where moist air ascends over mountains, leads to condensation and precipitation, causing heavy rainfall on the windward side of the mountains, which can trigger landslides. Additionally, climate change has resulted in changing weather patterns, leading to extreme and unpredictable rainfall, which can trigger cloudbursts. Global warming has caused glaciers to melt, forming glacial lakes that can overflow or burst due to additional rainfall, resulting in massive floods and landslides downstream. Intense human activity has also taken a toll on the region, leading to deforestation and land use changes. Deforestation for agriculture, infrastructure development, and hydropower projects destabilizes slopes, as forests act as natural barriers that hold the soil together. Unplanned construction of roads and other infrastructure without proper environmental assessments further increases the risk of landslides. Over time, major hydropower projects and dams have been built in the region, increasing water pressure on mountain slopes and making them prone to collapse. During heavy rainfall, water from these reservoirs is released in huge quantity, contributing to flash floods and landslides. Development projects often involve modifying river channels, impacting natural sediment flow and leading to sediment build-up in some areas and increased erosion in others, both of which can trigger landslides. Population growth further exacerbates these issues, increasing pressure on the land and leading to more deforestation as settlements expand into geologically unstable areas. The influx of tourists, especially during pilgrimage season, also contributes to the problem. To accommodate large numbers of tourists, extensive construction of roads, hotels, and other amenities takes place, putting immense pressure on the local environment.

Two major recent projects highlight the challenges of balancing development and environmental conservation. The Char Dham Road Project, aimed at connecting religious shrines in the hills, is a complex and contentious initiative that underscores the need for sustainable and carefully planned infrastructure development in ecologically sensitive areas. While the project promises to improve connectivity and economic opportunities, it has also sparked controversies over its environmental impact, legal challenges, and social implications. Similarly, Joshimath has been at the centre of ecological concerns due to projects aimed at improving infrastructure and boosting tourism. These projects have led to significant ecological imbalances, such as land subsidence and environmental degradation.

Recent disasters illustrate the dangers of unsustainable development. The Kedarnath floods of 2013, caused by an unprecedented cloudburst that breached Chorabari Lake, triggered massive floods and landslides, resulting in significant loss of life and property. The disaster is a stark reminder of the consequences of unplanned construction, deforestation, and inadequate disaster preparedness. The region lacked the capacity to accommodate such a large number of pilgrims who visit Kedarnath, highlighting the need for sustainable planning and better disaster preparedness. In Joshimath, continued development has led to widespread land subsidence, with parts of the town sinking. This phenomenon is attributed to geological instability, as well as the construction of a hydropower project and the Char Dham Road Project. The Rishiganga Glacier Burst of 2021 and recurrent forest fires in the region further highlight the growing ecological instability.

Despite severe ecological crises that have gripped the region in recent years, construction and development works continue unabated. It is crucial for governments to be more sensitive to ecological impacts and adopt sustainable practices when planning major infrastructure projects, particularly in ecologically sensitive areas. Comprehensive environmental impact assessments should be conducted to protect the environment, including flora, fauna, water resources, and local communities. Wider public consultation, especially with local communities, is also essential. Eco-friendly construction techniques should be adopted to minimize land disturbance, and sustainable building materials and techniques should be used to reduce the environmental footprint of construction. In addition to sustained conservation activities such as afforestation and reforestation, sustainable ecological practices, disaster-resilient infrastructure, sustainable urban planning, renewable energy integration, biodiversity conservation plans, waste management, and pollution control are all necessary. A balance must be struck between our infrastructural and environmental needs. Ultimately, we have a responsibility to pass on a secure and liveable future to future generations.

Wayanad

Down south, the district of Wayanad has also witnessed severe cloudbursts and landslides which have become recurrent in recent times. Not only Wayanad, the entire length and breadth of India has been battered by adverse climatic conditions ranging from heavy torrential rains and subsequent landslides and cloudbursts, floods to heat waves, rising atmospheric temperature, drought and irregular seasonal variations resulting in loss to life and resources. And reasons are not far to fathom. Unmindful of recurrent ecological disasters,

human activities have ceased to take note of sustainability concerns and developmental activities have gone unabated. Not only the fragile Himalayas have seen the fury of nature, down South, the Western Ghats and particularly the Wayanad region has witnessed massive devastations caused by the landslides of July 30. This happened despite the warnings issued by the Gadgil Committee report, officially known as the Western Ghats Ecology Expert Panel (WGEEP) set up by the Ministry of Environment and Forests in 2010 under the chairmanship of eminent ecologist Madhav Gadgil.

The Gadgil Committee set up under Madhav Gadgil in 2010 was tasked with assessing the ecological status of the Western Ghats, a UNESCO World Heritage site and world's one of the 'hottest hotspots' of biological diversity and suggest measures for sustainable development in the region. The Committee classified the Western Ghats into three Ecologically Sensitive Zones based on their ecological sensitivity. While Zone 1 comprised of most fragile areas with highest conservation priority and strict environmental regulations, Zone 2 were designated as areas with significant environmental value but allowed regulated development. In Zone 3 areas, more development was permitted under controlled guidelines. The entire Western Ghats region was recommended for protection with emphasis on balancing environmental conservation and local livelihood needs. The Committee also recommended and strongly advocated for decentralised environmental governance with bottom-up approach, ban on certain large-scale development activities particularly in Zone 1 like mining, hydropower projects, industries, quarries. Significant recommendations on agricultural activities included sustainable agricultural and plantation practices, organic farming, mixed cropping, advised against expanding monoculture plantations such as tea, coffee and rubber in order to reduce the ecological footprint of agriculture in the region. The Committee also recommended for the protection of forests and wildlife corridors, water resources management – watershed management and rainwater harvesting, discouraged large scale tourism projects in ecologically sensitive areas particularly in Zone 1 areas and promotion of eco-tourism and community based tourism. It also recommended for climate change mitigation strategies in order to protect the region from environmental degradation that could exacerbate the effects of climate change such as frequent floods, landslides and altered rainfall patterns.

Wayanad district falls within the Western Ghats and parts of it under Zone 1 and 2 as per Gadgil Committee recommendations, meaning stricter environmental regulations. The

region's ecological sensitivity, high rainfall and frequent landslides made it a fit case for more stringent conservation efforts. The Report highlighted concerns over expansion of plantation of tea and coffee which had contributed to deforestation and soil erosion and suggested for stronger land-use controls and better water management to prevent future disasters. The Committee had also suggested for regulated tourism infrastructure and advocated for eco-friendly tourism models that would not damage and alter the natural landscape. The Report was, however met with significant opposition particularly from political and industrial groups as its recommendations were seen as too stringent and restrictive for development that would affect the livelihoods of people dependent on agriculture, plantation and mining. In order to mitigate the backlash, the Kasturirangan Committee was formed to review and revise the recommendations of the Gadgil Report which suggested a more development friendly approach. With the dilution of the Gadgil Report several developmental activities were undertaken in expansion of plantation area and tourism infrastructure ultimately leading to increased footfall in an already ecologically fragile region.

Wayanad has had a series of landslides in 2018 and 2019 also along with the recent July devastations mainly due to its fragile terrain with steep slopes and heavy monsoon rains. The situation is further aggravated due to deforestation, unregulated development projects, and tourism infrastructure. The recommendations of the Gadgil Report have been diluted especially in Zone 1 and 2 leading to more catastrophes in the waiting. The recurrence of landslides in Wayanad is a consequence of not adequately addressing the root causes identified from previous disasters. Failure to regulate land use, controlled deforestation, implement sustainable agricultural practices, and improve rainwater management is some of the unlearned lessons that continue to trigger landslides. Until comprehensive measures are taken to address these issues, Wayanad will remain vulnerable to landslides, especially during heavy monsoon seasons.

Conclusion

To address these catastrophes, we must adopt a cautious approach to development in ecologically vulnerable areas. Development must proceed, but it must also address the concerns raised by scientists, academia, and NGOs. We are sitting on a ticking time bomb. Unless we take drastic measures to address environmental concerns, the day is not far when one ecological zone after another will be denuded of its pristine nature and humanity will

suffer an irreparable damage. The environment versus development debate is not a zero-sum game. Sustainable development can provide a pathway to economic growth while preserving the environment. The choices we make today will determine the future of our planet and the well-being of future generations. We stand at a crossroads, and the direction we choose will shape our collective destiny. Balancing economic growth with environmental stewardship is not just a necessity but a responsibility we owe to ourselves and future generations.

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