TOWARDS GREEN AND SUSTAINABLE DEVELOPMENT THROUGH COMMUNITY-BASED TOURISM: A MULTIDIMENSIONAL FRAMEWORK FOR UPLAND NORTHERN VIETNAM

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Abstract: *This paper explores the theoretical foundations, global trends, and practical pathways for green and sustainable economic development in the context of community-based tourism (CBT) in Northern Vietnam. Drawing on a multidisciplinary approach, the research integrates key concepts such as the green economy, circular economy, sustainable livelihoods, and climate resilience. Based on comparative case studies from Lao Cai, Ha Giang, and Yen Bai provinces, the paper synthesizes data from literature review, policy analysis, and stakeholder consultations. The findings highlight the potential of CBT to diversify rural livelihoods, promote ecological regeneration, and preserve indigenous cultures. It further identifies structural barriers such as weak institutional coordination, limited access to green finance, and inadequate digital infrastructure. The study proposes an integrated framework that links community empowerment, environmental governance, and digital innovation to enhance sustainable tourism ecosystems in upland regions. The paper concludes with policy recommendations to strengthen institutional capacity, mobilize green finance, and scale up digital platforms tailored to CBT development in ethnic minority areas.*

Keywords: *Community-Based Tourism; Green Economy; Circular Economy; Northern Vietnam; Sustainable Livelihoods.*

1. Introduction

In the 21st century, global development faces unprecedented challenges stemming from environmental degradation, resource depletion, biodiversity loss, and climate change. The conventional "brown economy" model heavily reliant on fossil fuels, linear production-consumption systems, and rapid urban expansion has reached its ecological limits. As a response, the concept of a "green economy" has emerged as a new paradigm, promoting low-carbon, resource-efficient, and socially inclusive growth that aligns economic development with environmental sustainability.

Within this global shift, rural and mountainous regions are increasingly recognized as both vulnerable and pivotal in the green transition. These areas often possess rich cultural heritage and biodiversity but face structural disadvantages such as geographic isolation, economic marginalization, and climate-related risks. Northern Vietnam home to multiple ethnic minorities and ecological hotspots such as the Hoang Lien Son mountain range presents a compelling case for integrated green development strategies.

Community-Based Tourism (CBT) has gained traction in these contexts as a development approach that not only generates alternative livelihoods but also contributes to environmental stewardship and cultural preservation. CBT, by its nature, aligns closely with the principles of a green economy, emphasizing local participation, low-impact practices, and equitable benefit-sharing.

This study investigates how green and sustainable economic development can be promoted through CBT in the upland provinces of Lao Cai, Ha Giang, and Yen Bai. It addresses key questions such as: How does CBT contribute to green growth and sustainable livelihoods? What are the institutional, technological, and

environmental conditions that enable or hinder this contribution? And what models or frameworks can guide future policy and practice?

The main objectives of this research are:

- To clarify the conceptual foundations of green economy, sustainable development, circular economy, environmental risk governance, and community-based tourism;

- To examine representative green growth models globally and regionally, especially those integrating tourism and rural livelihoods;

- To analyze the roles of institutions, technology, and communities in managing environmental risks and enhancing climate resilience;

- To propose actionable policy recommendations to promote green economic models tailored to upland communities in Northern Vietnam.

2. Literature Review

2.1 Green Economy and Sustainable Livelihoods

The concept of a green economy—as defined by UNEP (2011)—refers to an economic system that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities. Core principles include low-carbon development, resource efficiency, and social inclusion. In rural and upland regions, the green economy also involves biodiversity conservation, sustainable agriculture, and renewable energy adoption (Barbier, 2010; OECD, 2012).

In parallel, the sustainable livelihoods framework developed by Chambers and Conway (1992) identifies five types of capital—natural, human, social, physical, and financial—that influence a household's ability to achieve long-term well-being. In tourism contexts, sustainable livelihoods are enhanced when local communities can access new income streams, develop skills, and preserve their cultural and ecological assets (Ashley, 2000; Scoones, 1998).

When applied to community-based tourism (CBT), these frameworks converge to highlight the potential for low-impact, culturally respectful, and economically inclusive tourism practices that empower marginalized communities while maintaining ecological balance.

2.2 Community-Based Tourism: Global Perspectives

International studies have demonstrated that CBT, when properly implemented, contributes to rural transformation, poverty alleviation, and environmental sustainability. Regmi et al. (2023) analyzed homestay-based CBT in Nepal, emphasizing its role in diversifying income sources and preserving cultural identity. Similarly, Trejos and Chiang (2009) explored CBT in Costa Rica and found that even modest local linkages through food supply chains, guiding services, and handicrafts can generate significant multiplier effects.

Jackson et al. (2025) provided a meta-review of CBT's alignment with the United Nations Sustainable Development Goals, especially SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). However, they also noted persistent risks such as commercialization of culture, elite capture, and ecological overuse if governance mechanisms are weak.

In protected areas, CBT has also served as a conservation strategy. Studies in national parks across Asia and Africa report that CBT can reduce illegal resource extraction and promote community-led environmental monitoring (Stronza & Durham, 2008; Wunder, 2000).

2.3. Community-Based Tourism in Vietnam

In Vietnam, CBT has received increasing attention in recent years as a tool for poverty reduction and rural development. Pham Hong Long (2019) documented CBT initiatives across multiple provinces and concluded that they bring positive impacts on income, cultural revitalization, and gender empowerment. However, the author also highlighted limitations such as uneven benefit distribution and weak management capacity.

Nguyen Quang Nam & Nguyen Van Song (2022) offered a broader assessment of tourism's impacts on rural livelihoods, emphasizing both its potential to drive local development and the risks of environmental degradation and cultural commodification. Meanwhile, Nguyen Van Quyet (2024) focused on CBT in craft villages and underlined the importance of innovation and digital transformation for long-term

sustainability.

These studies affirm the relevance of CBT in Vietnam but also underscore the need for more context-specific analysis, especially in ethnic minority and mountainous regions where cultural dynamics, ecological sensitivity, and infrastructure constraints pose unique challenges.

2.4. Identified Research Gaps

Despite a growing body of literature, several key research gaps remain:

(1) Geographic specificity: Few studies focus systematically on CBT in the upland provinces of Northern Vietnam, particularly in highland ethnic communities with distinct socio-ecological systems.

(2) Integrated impact analysis: Most existing research emphasizes economic outcomes, with limited attention to environmental and climate-related dimensions of CBT.

(3) Climate resilience and risk governance: There is a lack of analysis on how CBT can function as a mechanism for climate adaptation and disaster risk reduction in ecologically fragile areas.

(4) Digital transformation in CBT: The role of digital tools such as online marketing, virtual tours, and digital storytelling remains underexplored in Vietnamese CBT contexts.

(5) Comparative and longitudinal approaches: There is a need for cross-case comparison and longitudinal studies to evaluate the long-term sustainability and scalability of CBT models.

2.5 Contribution of This Study

To address these gaps, this paper investigates CBT as a green economic strategy in the mountainous provinces of Northern Vietnam. It contributes by:

(1) Bridging green economy theory and CBT practice in ethnically diverse rural settings;

(2) Incorporating climate resilience and environmental governance into the CBT framework;

(3) Highlighting the role of digital innovation in enhancing CBT competitiveness;

(4) Offering a comparative analysis across three provinces Lao Cai, Ha Giang, and Yen Bai.

This contribution is expected to support both scholarly discourse and evidence-based policy design for sustainable rural transformation.

2.6. Core Conceptual Definitions

Brown Economy

The brown economy refers to the traditional growth model based primarily on the exploitation and consumption of fossil fuels such as coal, oil, and gas. It follows a linear pattern of production and consumption- "extract, produce, consume, and dispose"-which is unsustainable, resource-intensive, and responsible for significant greenhouse gas emissions. While the brown economy has historically driven rapid growth, it has also resulted in ecological degradation, pollution, social inequality, and increased climate vulnerability.

Green Economy

The green economy represents a paradigm shift toward an environmentally sustainable growth model. According to UNEP (2011), a green economy is *"one that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities."* In essence, it is an economy in which income and employment growth are driven by investments in environmental protection, efficient resource use, low-carbon technologies, and sustainable innovation.

Sustainable Development

As defined by the Brundtland Commission (1987), sustainable development is *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* Sustainability is built on the balanced integration of three pillars-economic efficiency, social inclusiveness, and environmental integrity. This tri-dimensional equilibrium underpins all policy frameworks for green growth andclimate resilience.

Circular Economy

The circular economy is a closed-loop system of production and consumption designed to minimize waste, maximize resource efficiency, and extend the lifecycle of products through reuse, recycling, and regeneration. It moves away from the "take–make–dispose" model toward one emphasizing "reduce–reuse–recycle", thereby conserving materials and lowering ecological footprints.

Environmental Risk

Environmental risk refers to the potential occurrence of events or processes that may cause adverse impacts on ecosystems, human health, and socio-economic systems. These risks encompass both natural hazards (floods, droughts, storms) and anthropogenic factors (pollution, deforestation, soil degradation). Effective risk governance requires integrated assessment, early warning systems, and cross-sectoral adaptation mechanisms.

Climate Change

Climate change denotes long-term shifts in temperature, precipitation, and atmospheric patterns caused by both natural variability and human-induced emissions. Anthropogenic activities-particularly fossil fuel combustion and deforestation-have intensified greenhouse gas concentrations, driving global warming and climate instability. Addressing climate change necessitates systemic mitigation and adaptation strategies across economic, social, and environmental domains.

Green Innovation

Green innovation refers to the development and implementation of new ideas, technologies, models, or processes that enhance resource efficiency, reduce environmental impacts, and foster sustainable value creation. As a core driver of the green transition in the 21st century, green innovation encompasses technological solutions (e.g., renewable energy, smart agriculture, waste-to-resource systems), institutional reforms, and behavioral transformations that collectively support green growth.

3. Research methods

The study primarily utilizes qualitative research methods, including:

- Literature Review: Systematic collection and analysis of international and domestic publications from UNEP, OECD, IPCC, UNDP, and national policy documents related to green growth, climate change, and sustainable development.

- Case Analysis: Selection, description, and analytical examination of best-practice cases to extract structural components, results achieved, and contextual determinants of success.

- Analytical Synthesis: Integration of theoretical insights and empirical evidence to generate generalized conclusions and policy-relevant interpretations.

Logical Argumentation: Construction of coherent arguments and conceptual frameworks consistent with the objectives of a theoretical and comparative research paper.

- Proposed Conceptual Framework: This study proposes a conceptual framework that integrates green growth, environmental risk governance, and community-centered digital innovation within a unified sustainability model. The framework builds on three foundational assumptions:

+ Economic restructuring is central to sustainability: Transitioning from a resource-intensive to a regenerative economic model requires aligning production, consumption, and governance systems around low-carbon and circular principles.

+ Environmental risk is both a driver and constraint of growth: Effective risk governance-incorporating climate adaptation, mitigation, and resilience planning-determines the long-term stability of green transformation.

+ Innovation and participation are catalytic mechanisms: Technological innovation (AI, IoT, digital monitoring) and community participation act as enabling processes that translate policy intentions into sustainable outcomes.

There for, the framework includes three components

(1) Inputs – Enabling Conditions: Policy and Institutional Foundations (National strategies, legal frameworks, and financial incentives for green investment);

Technological and Data Infrastructure (Digital systems for environmental monitoring, risk mapping, and innovation platforms); Community and Social Capital (Local governance structures, traditional ecological knowledge, and participatory networks).

(2) Processes – Transformation Mechanisms: Green Innovation (Technological, organizational, and institutional innovations promoting efficient resource use and low-carbon growth); Environmental Risk Governance (Integration of climate risk assessment into planning, budgeting, and spatial design); Community-Based Governance (Empowerment of local actors in

decision-making, monitoring, and adaptive management).

(3) Outputs – Development Outcomes: Sustainable Production and Consumption (Circular and regenerative systems reducing waste and emissions); Resilient Socio-Ecological Systems (Enhanced capacity to anticipate, absorb, and adapt to environmental shocks); Inclusive Green Prosperity (Equitable distribution of benefits, gender and ethnic inclusion, and improved quality of life).

These three layers interact dynamically as Policies create the enabling environment; innovation and governance mechanisms operationalize sustainability; and community participation ensures social legitimacy and resilience.

Feedback loops occur when data-driven insights from communities and digital systems inform new policy adjustments, thereby institutionalizing adaptive governance. This integrative model demonstrates that the path to a green and sustainable economy depends on: Co-evolution between technological advancement and institutional reform; Synergy between top-down policy and bottom-up participation; and Continuous learning and feedback among economic, environmental, and social subsystems.

The framework thus serves as both a theoretical lens and a practical guide for analyzing green transformation in Vietnam. It highlights that *sustainability is not a linear outcome but a dynamic process* where innovation, governance, and community empowerment interact within a multi-level system of change.

4. Research results

Based on an extensive review of international experiences, the study identifies two key analytical dimensions: Representative models of green economic growth, and

Approaches to environmental risk management and climate adaptation.

These findings form a comprehensive foundation for policy learning, cross-country comparison, and contextual adaptation in Vietnam's transition toward sustainable development.

4.1. Representative Models of Green Economic Growth

4.1.1. The Eco-City Model

An eco-city is an urban system designed and managed according to sustainability principles-energy efficiency, renewable energy use, waste reduction, protection of green spaces, and promotion of low-emission mobility.

Freiburg, Germany – A Model of European Urban Sustainability

Located in southwestern Germany, Freiburg is often referred to as the "Environmental Capital of Europe." With a population of approximately 230,000, the city exemplifies the successful integration of economic growth, environmental protection, and quality of life.

Key achievements include:

- Green mobility: Over 70% of residents use public or non-motorized transportation (light rail, buses, bicycles, pedestrian routes).

- Solar energy leadership: More than 4,000 buildings are equipped with solar panels, including public facilities, private homes, and university campuses.

- Energy-efficient architecture: Urban buildings comply with low-energy or passive house standards, minimizing energy consumption.

- Clean technology industries: Freiburg is home to numerous renewable energy and environmental technologyfirms.

- Participatory governance: Transparent urban management encourages civic involvement in planning andmonitoring.

- Environmental education: Schools and research institutes promote environmental awareness and innovation.

Freiburg's experience demonstrates that green urbanization is feasible even within modern development contexts. Its success stems from policy coherence, citizen participation, and strategic investment in green infrastructure-providing a practical model for cities aiming to integrate ecology, economy, and community well-being.

Masdar City, United Arab Emirates – A High-Tech Zero-Carbon Urban Laboratory

Initiated in 2006 on the outskirts of Abu Dhabi, Masdar City is envisioned as a "zero-carbon, zero-waste" smart city within a desert

environment. The project serves as a living laboratory for clean technologies, energy efficiency, and sustainable urban design.

Core objectives include:

- Achieving net-zero carbon emissions by 2050;

- Constructing infrastructure based on sustainable building standards (Estidama 3-Pearl rating system); Integrating renewable energy, water recycling, and waste recovery systems;

- Reducing energy demand through compact urban design-narrow streets and shading layouts that mitigate desert heat;

- Implementing a Personal Rapid Transit (PRT) system powered by renewable energy.

Masdar City symbolizes sustainable urban innovation in the Middle East, showcasing cutting-edge practices in green architecture, clean technology, and resource management. Despite challenges such as high implementation costs and limited scalability, it provides valuable lessons on the interplay between urban planning, technology, and environmental policy.

4.1.2. The Circular Economy Model

The circular economy represents an advanced green growth strategy focused on optimizing material cycles, minimizing waste, and transforming industrial systems toward regenerative production.

The Netherlands

The Dutch government aims to achieve a fully circular economy by 2050, with an interim target of reducing primary raw material use by 50% by 2030. The national roadmap, *A Circular Economy in the Netherlands by 2050* (2016), outlines key priority sectors: consumer goods, plastics, construction, manufacturing, biomass, andfood systems.

The 2023–2030 National Circular Economy Program emphasizes four actions:

- Reducing material consumption;

- Substituting renewable inputs; Extending product lifecycles;

- High-grade recycling to maintain resource value.Success factors include:

- Tripartite collaboration among government, private sector, and civil society; Innovation ecosystems that connect research institutions and startups; Policy alignment integrating environmental goals into industrial planning.

However, challenges persist in measuring progress, managing global supply chains, and shifting consumer behavior. The Dutch case demonstrates that transitioning to circularity requires long-term commitment, social transformation, and international cooperation.

Japan

Japan has institutionalized circularity through its Fundamental Plan for Establishing a Sound Material-Cycle Society (Ministry of the Environment, 2020). Key mechanisms include:

- Extended Producer Responsibility (EPR): Manufacturers are legally obliged to manage post-consumer waste and recycling of their products.

- Design for Environment (DfE): Product design prioritizes recyclability, material efficiency, and reduced environmental impact.

- Zero-waste enterprises: Businesses are encouraged to eliminate landfill waste and reintegrate materials into production cycles.

Japan's recycling rate for plastics reaches approximately 24%, supported by a strong legal framework and corporate participation. However, high administrative costs and complex waste sorting systems remain constraints. The Japanese experience illustrates that circular transformation requires not only recycling technologies but also systemic redesign across production, consumption, and governance.

4.1.3.Ecological and Regenerative Agriculture Models

These models promote sustainable farming systems that restore soil fertility, conserve water, and preserve biodiversity while improving rural livelihoods.

Peru

In Peru's mountainous and rainforest regions, traditional mixed cropping systems are being revitalized through regenerative agriculture initiatives aimed at soil restoration, ecosystem recovery, and climate adaptation.

Key practices include:Use of bio-fertilizers and microbial soil treatments; Conversion of open grazing to integrated agroforestry-pastoral systems; Enhancement of agrobiodiversity through crop diversification.

Reported outcomes include yield increases

from approximately 700 kg/ha to 1,000 kg/ha within several years, along with reduced chemical input costs and enhanced ecological resilience.

India – Regenerative Agriculture for Climate-Resilient Farming

India faces severe agricultural challenges-soil degradation, excessive agrochemical use, and water scarcity. Through programs such as the National Innovations in Climate Resilient Agriculture (NICRA), regenerative practices are being promoted.

Examples include: Rice cultivation projects in Telangana applying Alternate Wetting and Drying (AWD) and efficient irrigation, reducing GHG emissions by ~39% and water use by ~34%; Agroforestry models in Odisha, combining cotton, legumes, and short-cycle vegetables to improve soilfertility and diversify income.

Results indicate improved carbon sequestration, water efficiency, and smallholder incomes—showing that regenerative agriculture can rebuild ecosystems while sustaining productivity.

4.1.4. *Ecotourism and Community-Based Tourism (CBT)*

Costa Rica

Costa Rica, with 25% of its land designated as protected areas, has transformed biodiversity into a core asset for sustainable tourism and economic growth. Ecotourism contributes over 8% to national GDP, emphasizing low-impact travel, environmental education, and local community participation. Guiding principles include minimizing physical and behavioral impacts, fostering environmental awareness, and ensuring that benefits flowdirectly to host communities.

Costa Rica demonstrates that tourism and conservation can be mutually reinforcing when supported by strong governance and equitable benefit-sharing mechanisms.

Thailand

Thailand's Community-Based Tourism (CBT) has been widely implemented since the 1990s under the motto *"Tourism by the local people, for the local people."* CBT emphasizes community ownership, participatory planning, and fair distribution of tourism revenues. Local residents engage in tour design, homestay services, craft production, and cultural

performances-turning heritage and landscapes into economic assets.

The Thai experience shows that CBT not only preserves cultural identity but also reduces rural-urban migration by generating sustainable livelihoods within local communities. Its principles provide valuable insights for Vietnam's mountainous ethnic minority regions, where culture, ecology, and tourism are deeply intertwined.

4.2. Environmental Risk Management and Climate Adaptation

4.2.1. Integrating Climate Risk into Development Planning

Several countries-including Germany, Australia, and Bangladesh-have successfully integrated climate risk assessment into spatial, regional, and socio-economic development planning. These examples demonstrate how cross-sectoral institutional frameworks can transform climate data into practical planning instruments.

Germany

Germany has established a national policy framework under the Federal Climate Adaptation Act, which mandates periodic updates of the German Strategy for Adaptation to Climate Change (DAS) every four years. The 2021 report, *Climate Impact and Risk Assessment (KWRA)*, prepared by 25 federal agencies, evaluated over 100 climate impacts across 13 priority sectors.

According to the German Environment Agency (Umweltbundesamt), climate adaptation has become a key cross-sectoral theme within spatial, regional, and urban development planning. Land-use zoning, infrastructure investment, and spatial design are now required to integrate assessments of flood risk, heat exposure, soil erosion, and disaster preparedness.

The German model underscores that climate risk assessment must extend beyond national policy to reach regional and municipal levels. Tools such as vulnerability indices, spatial risk maps, and scenario modeling are essential for guiding resilient land-use decisions. However, gaps remain at the local level, where smaller municipalities often lack data, expertise, and institutional capacity to conduct comprehensive

risk assessments.

Australia

Australia has implemented the first National Climate Risk Assessment (NCRA) to identify eleven priority climate risks across seven critical systems-community, infrastructure, economy, water, industry, environment, and ecosystems.

The NCRA findings serve as a foundation for the National Adaptation Plan, which informs strategic investment and policy priorities.

By identifying key hazards-such as sea-level rise, flooding, bushfires, and infrastructure vulnerability-the assessment integrates climate risk into regional and land-use planning processes. Urban and coastal zoning now explicitly considers exposure levels when designating development areas and infrastructure types.

The Australian case illustrates how a national risk assessment can become an actionable planning tool. Yet, data interoperability, interagency coordination, and local implementation capacities remain critical challenges for ensuring that risk-informed planning becomes institutionalized rather than symbolic.

Bangladesh

Bangladesh is among the world's most climate-vulnerable nations, exposed to recurrent floods, cyclones, and coastal erosion. To address this, the government developed the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) and subsequent frameworks focusing on risk data integration, interagency coordination, and climate finance mobilization.

These frameworks strengthen reporting, data aggregation, and adaptive investment planning, transforming risk assessment into a strategic tool for development. In practice, however, Bangladesh's main challenge lies in localizing data-driven risk assessments—translating national climate data into actionable policies for coastal and rural areas. The country's experience highlights the importance of climate finance, international partnerships, and institutional capacity-building as prerequisites for effective adaptation.

4.2.2. Digital Technologies for Environmental Monitoring

In an era of escalating environmental uncertainty, digital transformation has become a cornerstone of environmental risk management. Emerging technologies are revolutionizing how governments and organizations monitor ecosystems, detect hazards, and make timely, evidence-based decisions.

Key technological applications include: Sensors and IoT devices for real-time monitoring of air, water, soil, and meteorological parameters; Data transmission networks (LPWA, 4G/5G, satellite links) that enable continuous environmental data collection; Remote sensing and GIS mapping for spatial visualization and risk mapping; Artificial intelligence (AI), machine learning (ML), and big data analytics for early warning and predictive modeling; Digital twins and interactive dashboards for multi-sectoral simulation and decision support.

These innovations create an integrated digital environmental monitoring system, enhancing transparency, responsiveness, and accuracy.

Countries such as Singapore, the United States, and South Korea have demonstrated how AI-driven environmental analytics can detect forest fires, forecast floods, and monitor urban air quality with high precision. However, the human and institutional dimensions remain critical: digital solutions must be accompanied by data governance frameworks, technical training, and community engagement to ensure inclusivity and accountability.

Thus, digital technology is not merely a monitoring tool but a strategic enabler of the green economy, bridging data, policy, and community participation for sustainable development.

4.2.3. Community-Based Risk Governance

Community-based risk governance (CBRG) places local communities at the center of risk management, transforming them from passive beneficiaries into active participants. This approach recognizes that residents possess contextual knowledge, adaptive practices, and local leadership structures vital to resilience-building.

Key components of effective CBRG include:

- Risk Identification and Assessment: Participatory mapping of hazards, vulnerabilities, and exposure zones atthe community level.

- Planning and Preparedness: Localized strategies for prevention, mitigation, and emergency response (e.g., flood defenses, early warning drills, reforestation).

- Implementation and Monitoring: Community involvement in executing and evaluating resilience measures.Learning and Adaptation: Continuous feedback loops that allow communities to revise strategies and strengthen institutional memory.

The advantages of community-based governance include: Enhanced local ownership and sustainability of risk-reduction measures; Integration of indigenous knowledge with modern science; Strengthened collaboration between communities, local governments, and NGOs; Promotion of social equity by empowering the most vulnerable groups.

Nevertheless, challenges persist: limited technical capacity, fragmented funding, inconsistent policy support, and weak legal recognition of community roles. To be effective, community-based risk governance must be institutionally embedded, with formal mechanisms for representation, decision-making, and access to financial resources.

Global research underscores that empowering communities is key to effective climate and disaster risk reduction. Blending local wisdom with digital tools—such as participatory GIS, mobile applications, and low- cost sensors-can significantly enhance grassroots resilience. Ultimately, sustainable risk management is achieved when community action becomes an integral part of national resilience systems.

5. Discussions

Through comparative analysis of representative experiences from countries such as Germany, the Netherlands, Japan, Singapore, Bangladesh, Costa Rica, and Peru, it becomes evident that the pursuit of green and sustainable economic development is not merely a global trend-it is an urgent necessity for addressing climate change, resource depletion, and inequality. While each country demonstrates distinct approaches, their collective experiences reveal several universal principles and foundational lessons.

5.1. Green Economy as a Structural

Transformation, Not Merely an Environmental Goal

The cases of the Netherlands' circular economy, Japan's zero-waste enterprises, and Peru's regenerative agriculture indicate that leading nations do not treat the green economy as an *alternative option*, but as a core paradigm for restructuring economic systems.This transformation generates new forms of value creation by combining technological innovation, resource efficiency, and inclusive social policies.The shift from "brown" (resource-intensive) to "green" (resource-regenerative) growth is therefore not cosmetic but systemic—aiming to decouple prosperity from pollution.

For developing countries such as Vietnam, particularly its mountainous northern provinces, this lesson is crucial: green transition should be viewed as a comprehensive restructuring process-one that integrates local culture, natural capital, and digital innovation into development strategies.

5.2. Environmental Risk Governance Must Be Systemic, Anticipatory, and Planning-Based

The experiences of Germany, Australia, and Bangladesh highlight that effective risk management requires institutional integration rather than isolated sectoral responses.

In Germany, risk mapping and climate impact assessments are integrated into urban and regional planning; in Australia, national risk assessments inform adaptation investments; and in Bangladesh, community-based adaptation frameworks link risk data to livelihood strategies.

These cases collectively demonstrate that climate risk governance must be: Systemic, covering interconnected socio-ecological and economic systems; Anticipatory, focusing on prevention and early warning rather than reaction; Embedded, integrated into spatial, socio-economic, and infrastructure planning.

For Vietnam, this implies the necessity of developing a multi-tiered climate risk information system, connecting national databases with local applications and decision-making tools.

5.3. Digital Transformation as a Catalyst for Green Economy and Climate Resilience

From global platforms such as PRISM (WFP), Global Forest Watch (WRI), and Virtual Singapore, to national AI-based environmental systems, digital transformation has fundamentally changed the way governments manage resources and risks.

Artificial intelligence (AI), remote sensing, and Internet of Things (IoT) technologies enable real-time data collection and predictive modeling, facilitating evidence-based governance.

However, technology alone is insufficient. Its effectiveness depends on three enabling conditions: Data quality and interoperability – consistent, high-resolution data accessible across institutions; Transparent governance mechanisms – clear regulations for data sharing, accountability, and privacy;

Human capacity and inclusivity – training and participatory systems that allow communities to benefit fromtechnology.

In short, digitalization must go hand in hand with institutional and social innovation to ensure that the green economy is not only efficient but also equitable and resilient.

5.4. Community-Centered Governance: The Foundation of Sustainable and Equitable
Development

A recurring insight from international practice is that communities are not beneficiaries-they are agents of change.

The success of Community-Based Disaster Risk Management (CBDRM) and Community-Based Tourism (CBT) models worldwide demonstrates that empowering communities enhances resilience, ownership, and sustainability.

When communities are equipped with knowledge, decision-making power, and access to resources, their capacity to adapt and recover from environmental shocks significantly increases.

In Vietnam's mountainous regions, where ethnic diversity and ecological fragility coexist, local participation is vital. Integrating community knowledge, cultural heritage, and traditional ecological practices into planning and tourism management will reinforce both cultural continuity and ecological stability.

Community empowerment thus becomes not only a tool for risk reduction but a moral and developmental imperative-ensuring that sustainability translates into justice, dignity, and shared prosperity.

5.5. Implications for Vietnam and the Northern Mountainous Region

The comparative analysis of international experiences reveals valuable lessons for Vietnam as it pursues a transition toward a green and sustainable economy. For the northern mountainous region-characterized by fragile ecosystems, rich cultural diversity, and limited infrastructure-the green transition must be both place-based and community-driven. The following implications provide a contextualized roadmap for policy, planning, and implementation.

5.5.1. Integrating Green Transition into National and Regional Planning

Vietnam should institutionalize green-growth objectives as cross-cutting priorities within its socio-economic and spatial development strategies. For mountainous provinces such as Lào Cai, Yên Bái, Hà Giang, and Lai Châu, this means:

- Embedding low-carbon and circular-economy principles into regional master plans, tourism strategies, and agricultural restructuring programs;

- Prioritizing ecosystem-based land-use planning, which balances conservation and livelihood needs through zoning for forest protection, eco-agriculture, and community tourism;

- Establishing provincial "Green Transition Task Forces" to coordinate multi-sectoral implementation across environment, agriculture, tourism, and digital-governance agencies.

These mechanisms will ensure that sustainability becomes a structural pillar of regional competitiveness rather than an add-on policy goal.

5.5.2. Developing Green Economic Sectors Anchored in Local Strengths

The northern highlands possess comparative advantages in ecological agriculture, cultural tourism, and forest-based livelihoods. Building on the successful models identified in the study,

Vietnam should foster:

- Regenerative agriculture systems combining indigenous farming practices with climate-smart technologies (e.g., organic fertilizers, micro-irrigation, biochar use);

- Community-based ecotourism networks emphasizing cultural authenticity, equitable benefit-sharing, and environmental stewardship-drawing inspiration from Thailand's CBT model and Costa Rica's eco-tourism approach;

- Agro-forestry and medicinal-plant value chains to create sustainable income while restoring degraded landscapes;

- Small and medium-sized green enterprises that connect local producers with national and international eco-markets through digital platforms.

Such localized green industries can generate diversified livelihoods, reduce poverty, and strengthen resilienceagainst external shocks.

5.5.3. Strengthening Environmental Risk Governance and Climate Resilience

Lessons from Germany, Australia, and Bangladesh highlight the necessity of systemic climate-risk integration. For Vietnam's northern mountainous provinces, this translates into:

- Establishing provincial climate-risk assessment systems with geo-spatial mapping of landslides, flash floods, and drought vulnerability;

- Integrating risk data into infrastructure and tourism development plans to avoid maladaptation;

- Promoting community-based disaster-risk management (CBDRM) models that blend scientific tools withlocal knowledge;

- Mobilizing climate finance and insurance mechanisms for smallholders and cooperatives affected by extremeweather.

Embedding adaptive planning into development decision-making will safeguard both natural capital and locallivelihoods.

5.5.4. Leveraging Digital Transformation for Environmental and Cultural Governance

Building on the global trend of data-driven environmental management, Vietnam should expand its digital transformation strategy (Chuyển đổi số) to include green-economy dimensions. Key actions include:

- Deploying IoT-enabled environmental monitoring systems for forests, rivers, and agricultural zones;

- Creating open-data platforms connecting ministries, provinces, and local communities to share real-time environmental and tourism information;

- Utilizing AI-based tools for predicting climate risks, managing tourist flows, and optimizing resource use;

- Digitizing cultural heritage archives and developing virtual tourism products to enhance visibility and diversify income sources for ethnic communities.

These applications will modernize environmental governance and promote cultural sustainability throughinnovation.

5.5.5. Empowering Ethnic Minority Communities as Key Agents of the Green Transition

Sustainability in the northern mountains depends fundamentally on the participation of ethnic minority communities (Hmong, Dao, Tay, Giay, Xa Pho, etc.). Following the principles of community-based governance,Vietnam should:

- Recognize and integrate indigenous ecological knowledge in forest management and sustainable farming policies;

- Support local cooperatives and social enterprises (HTX mo hinh xanh) to manage eco-tourism, traditional crafts, and natural-product processing;

- Promote gender equality and youth participation in green entrepreneurship and digital-skills programs;

- Establish capacity-building centers at district or provincial levels to provide continuous training in green innovation, financial literacy, and digital tools.

Empowering communities transforms them from beneficiaries into co-architects of the green economy and ensures that cultural identity and ecological integrity advance together.

5.5.6. Enhancing Cross-Border and Inter-Regional Cooperation

Given the ecological and cultural continuity between northern Vietnam and southern China (Yunnan), transboundary cooperation should be strengthened through:

- Joint eco-tourism and cultural-heritage

initiatives along the Red River and Hoàng Liên Sơn range; Collaborative research on biodiversity conservation and climate adaptation;

- Green trade corridors that prioritize sustainable products and renewable-energy logistics.

Such regional partnerships can transform the northern highlands into a model of "cross-border green integration", aligning local prosperity with international sustainability standards.

5.5.7. Building Inclusive Green Governance and Evaluation Mechanisms

To sustain progress, Vietnam must adopt transparent, data-driven monitoring frameworks that align with global standards (SDGs, ASEAN Clean Tourism, Green Lotus). Provinces should develop Green Development Indexes (GDI) combining indicators on economic efficiency, ecological health, and social inclusion. This will enable policymakers to track outcomes, adjust interventions, and ensure accountability at every level.

The implications derived from global experiences underscore that Vietnam's green transformation- particularly in the northern mountainous region requires a multi-level, innovation-driven, and community- centered approach.

Success depends on balancing economic modernization with cultural preservation, leveraging digital technology, and ensuring that ethnic minority communities become active participants in shaping a resilient and inclusive green future.

Future research should incorporate:

- Quantitative evaluation of green growth performance indicators across regions and sectors in Vietnam;

- Field surveys and stakeholder interviews to assess community participation in environmental governance;

- Scenario-based simulation using digital tools to test policy effectiveness under climate uncertainty;

- Comparative research at provincial level (e.g., Lao Cai, Tuyen Quang, Son La…) to design localized green- economic transition models.

These directions will strengthen empirical validation and enhance practical policyrelevance.

6. Conclusion

This research demonstrates that the transition toward a green and sustainable economy is not a temporary policy trend but a structural and existential requirement for economic resilience, social equity, and environmentalpreservation.

The analysis of international experiences confirms several pivotal findings:

- Transformation of Production and Consumption Models: Green economies rely on circular and regenerative systems that minimize emissions, restore resources, and generate inclusive prosperity.

- Integration of Climate Risk into Development Planning: Adaptive governance demands that environmental risks and climate projections be embedded into land-use, spatial, and economic strategies at all scales.

- Digital Technologies as Strategic Enablers: Data-driven decision-making, powered by artificial intelligence, remote sensing, and digital twins, enhances monitoring, forecasting, and sustainable resource management.

- Empowering Communities as Agents of Change: Grassroots participation, indigenous knowledge, and local resilience are indispensable components of climate adaptation and sustainable development.

However, the application of these models in developing contexts such as Vietnam must account for institutional, financial, cultural, and livelihood-specific factors. The success of green transition policies depends on tailoring global best practices to local realities, integrating policy innovation, community participation, and technological readiness.Final Remark

The lessons drawn from global practices reaffirm that achieving sustainability is not solely a technical challenge, but a societal transformation. A truly green economy is one that harmonizes innovation with equity, integrates nature into economic logic, and places the community at the heart of decision-making.

As the world moves toward uncertain environmental futures, building resilience through inclusive, knowledge-driven, and ethical development remains the most sustainable route forward.

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HƯỚNG TỚI PHÁT TRIỂN XANH VÀ BỀN VỮNG THÔNG QUA DU LỊCH DỰA VÀO CỘNG ĐỒNG: KHUNG TIẾP CẬN ĐA CHIỀU CHO VÙNG MIỀN NÚI PHÍA BẮC VIỆT NAM

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Tóm tắt: *Bài viết này phân tích cơ sở lý luận, xu hướng toàn cầu và các định hướng thực tiễn cho phát triển kinh tế xanh và bền vững trong bối cảnh du lịch dựa vào cộng đồng tại khu vực miền núi phía Bắc Việt Nam. Trên cơ sở tiếp cận liên ngành, nghiên cứu tích hợp các khái niệm then chốt như kinh tế xanh, kinh tế tuần hoàn, sinh kế bền vững và khả năng chống chịu với biến đổi khí hậu. Dựa trên các nghiên cứu trường hợp so sánh tại các tỉnh Lào Cai, Hà Giang và Yên Bái, bài viết tổng hợp dữ liệu từ tổng quan tài liệu, phân tích chính sách và tham vấn các bên liên quan. Kết quả nghiên cứu cho thấy CBT có tiềm năng đa dạng hóa sinh kế nông thôn, thúc đẩy tái tạo sinh thái và bảo tồn các giá trị văn hóa bản địa. Đồng thời, nghiên cứu cũng chỉ ra những rào cản mang tính cấu trúc, bao gồm sự phối hợp thể chế còn hạn chế, khả năng tiếp cận tài chính xanh còn thấp và hạ tầng số chưa đáp ứng yêu cầu. Trên cơ sở đó, bài viết đề xuất một khung tiếp cận tích hợp, gắn kết trao quyền cho cộng đồng, quản trị môi trường và đổi mới sáng tạo số nhằm tăng cường hệ sinh thái du lịch bền vững tại các vùng cao. Bài viết kết luận bằng các khuyến nghị chính sách nhằm nâng cao năng lực thể chế, huy động nguồn lực tài chính xanh và mở rộng các nền tảng số phù hợp với phát triển du lịch dựa vào cộng đồng tại các khu vực đồng bào dân tộc thiểu số.*

Từ khóa: Du lịch dựa vào cộng đồng; Kinh tế xanh; Kinh tế tuần hoàn; Miền Bắc Việt Nam; Sinh kế bền vững.

123