

Community-Based Eco-Tourism (CBET) as a Climate Adaptation Strategy in Tea-Producing Regions: A Comparative Study of Assam, Nuwara Eliya, and Kericho

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Climate change poses significant challenges to monoculture agricultural systems, particularly tea-producing regions that are highly sensitive to climatic variability. While adaptation efforts have largely focused on technological and agronomic solutions, limited attention has been given to alternative livelihood strategies such as tourism. This study examines the role of Community-Based Ecotourism (CBET) as a climate adaptation strategy through a comparative qualitative analysis of Assam (India), Nuwara Eliya (Sri Lanka), and Kericho (Kenya). Drawing on 72 semi-structured interviews, nine focus group discussions, and field observations across twelve villages, the study employs thematic analysis to assess how CBET supports livelihood diversification, environmental conservation, and sociocultural empowerment. The findings indicate that CBET functions as a multi-dimensional adaptation mechanism by reducing dependence on climate-sensitive tea production, promoting conservation practices, and enhancing community participation. However, its effectiveness varies across contexts, shaped by institutional support, infrastructure, market access, and governance structures. CBET operates as a buffering strategy in Assam, a structured diversification pathway in Nuwara Eliya, and an emerging employment avenue in Kericho. The study advances theory by integrating resilience, sustainable livelihoods, and empowerment frameworks, conceptualizing CBET as a socio-ecological adaptation system. It highlights the context-dependent nature of CBET and offers policy insights for strengthening climate resilience in plantation economies.

Keywords: *Community-Based Ecotourism (CBET); Climate Change Adaptation; Livelihood Diversification; Resilience; Plantation Economies; Sustainable Tourism*

1 INTRODUCTION

Climate change has become one of the most critical issues that can be met by agricultural systems in general and more specifically, monoculture economies that are climate sensitive. Of them tea farming, revolving around *Camellia sinensis* is the most susceptible because it is restricted to a certain range of temperatures, rainfall movements, and ecological stability. Climatic changes, even small ones, may have a big impact on the yield, quality and production cycles, directly affecting the economic

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sustainability of tea-producing regions. Recent reports show that climate variability such as unpredictable rainfall, long droughts and rising temperatures, and extreme weather patterns are becoming more and more frequent and are escalating risks in large tea growing regions in Asia and Africa.

In places like Assam (India), Nuwara Eliy (Sri Lanka), and Kericho (Kenya), tea farming is the basis of the local economy and livelihood. But the monoculture based agriculture increases the vulnerability as the climatic shocks translate directly to income variability, job instability, and socio-economic strain. The conventional ways of adapting to a changing environment in agriculture have better been centered on technical interventions, which include better irrigation systems, resistant crop varieties and pest control methods. Essential as these measures are, they in most cases fail in overcoming more general structural weaknesses associated with livelihood diversification, social equity, and institutional capacity.

Somewhat in reaction, a transformation has been increasing towards integrated and community-based adaptation plans that focus on livelihood diversification and social-ecological resilience. In this regard, Community-Based Ecotourism (CBET) has come to the scene as a feasible option. CBET is the tourism enterprises, which are owned, managed and operated by the local communities with the dual purpose of preserving natural resources and creating sustainable livelihoods. In contrast to traditional forms of tourism, CBET puts importance in local participation, fair distribution of benefits, maintenance of cultural legacy as well as environmental control and management, thus making sure that economic development is aligned to ecological sustainability.

The applicability of CBET to climate adaptation is its multi-dimensionality as a resilience mechanism. CBET can facilitate income diversification because of its resilience to livelihoods means that such activities would be less dependent on the climate because the activity is sensitive to weather conditions. Regarding the ecological resilience perspective, it advocates conservation-focused practices as reforestation, protection of biodiversity and wise management of resources. At the same time, through the prism of sociocultural resilience, CBET boosts the ability to maintain community coherence, local agency, and cultural identity through integrating tourism into indigenous knowledge systems and practices.

These dimensions can be conceptualized with the assimilation of three theories. To begin with, the concept of resilience theory views the ability of socio-ecological systems to endure disruptions and restructure amid change. Second, the sustainable livelihoods framework places great importance in the diversification of assets and capabilities in decreasing vulnerability. Third, the empowerment theory emphasizes that inclusive development requires involvement, agency and equitable resource distribution. Although the application of each of these frameworks has been extensively studied separately, their concomitant use as a climate adaptation approach to tourism, especially in plantation-based economies is a topic that is not yet thoroughly examined.

Available literature on tourism and climatic adaptation studies has been majoring in the study of the protected areas, coastal areas, and the hot aspect of biodiversity with little focus in the agricultural landscape of the tea plantations. In an equivalent manner, agricultural adaptation studies have mostly focused on technological and production-related solutions overlooking the possibility of tourism as a supplementary livelihood approach. Such a disciplinary fault line has led to a disjointed perception of the role played by community-based tourism in ensuring climate resilience in monoculture economies.

The empirical research on CBET in plantation settings tends to be confined to individual case-studies and thus frustrate attempts to achieve general patterns and contextual differences. There are limited comparative cross-national studies, especially where there is a very big difference between the socio-economic system, institutional frameworks, and the levels of tourism development. Consequently, little is known about whether and how CBET can be scaled and context-sensitive adjustments strategy in different settings.

In order to fill these gaps, in the current study, a comparative qualitative methodology would be used to explore the significance of CBET as a climate adaptability mechanism across three large tea-producing areas of Assam (India), Nuwara Eliya (Sri Lanka), and Kericho (Kenya). These regions were chosen because they are very climatic vulnerable, rely heavily on tea economies and because they possess or are currently developing CBET initiatives. The research is aimed at producing a more detailed and generalizable insight into the adaptive capacity of CBET through analyzing a variety of cases in various geographical and socio-institutional settings.

Three major objectives guide the study: (1) to determine the role that CBET plays in strengthening climate resiliency by diversifying livelihoods in tea-growing communities; (2) to determine the socio-economic, environmental, and empowerment impacts of CBET; and (3) to determine cross-case patterns and contextual differences in implementation and effectiveness of CBET as an adaptation strategy.

This research makes a contribution to the further evolution of the scholarly discussions on the resilience in plantation economies by combining the insights provided by tourism-related studies, climate adaptation research, and the development theory. It aligns CBET as not an alternative form of tourism, but consists of a hybrid socio-ecological platform that can facilitate responsive change in territories that suffer due to climatic conditions. By so doing, it offers near theoretical progress as well as policy-relevant contributions towards promoting sustainable, inclusive, context-sensitive climate adaptation measures.

2 LITERATURE REVIEW

This convergence of climatic change, agriculture and tourism has attracted an increasing scholarly interest in alternative livelihood approaches like Community-Based Eco-Tourism (CBET), especially in single-crop areas, like tea-producing landscapes. According to the literature, CBET does not only promote diversification of the economy, but also improves climate resilience due to the participation of the community, use of the resources in a sustainable manner, and maintenance of cultural practices.

2.1 Sustainable tourism and community-based tourism (CBT)

The mainstream idea of sustainable tourism is the promotion of economic progress and environmental protection along with socio-cultural respectfulness (Amerta, 2018; Niedziolek, 2014; Soratana et al., 2021). Ecological sustainability and community welfare are put under focus in planning structures (Angelevska-Najdeska and Rakicevik, 2012). In such a paradigm, Community-Based Tourism (CBT) turns out to be a participatory paradigm whereby the local communities directly contribute to the tourism planning and profit sharing (Aris Anuar & Mohd Sood, 2017).

CBT fosters empowerment, local ownership, and equitable development outcomes (Ginanjar, 2023; Hermawan et al., 2023). Nevertheless, they are still faced with issues like insufficient capacity, governance, and inequitable distribution of benefits (Setokoe and Ramukumba, 2020). Certain stakeholder associations can be especially useful to help develop an effective CBT, an idea that is emphasized by the Penta Helix model that combines government, community, academia, industry, and media (Azwar et al., 2023).

2.2 Community empowerment and involvement in the development of tourism

One of the profound foundations of sustainable tourism development is community empowerment, as it allows local populations to take an active part in decision-making, as well as managing resources (Achmad et al., 2023; Buchari and Sudrajat, 2018). Research emphasizes the idea that conflicts caused by tourism development may be alleviated with the help of participatory approaches and guarantee the equal distribution of the benefits (Rahmitasari & Amrullah, 2018).

The importance of local knowledge and cultural identity in the area of tourism development on the preservation of heritage and development of authentic experience has been highlighted as well (Fuste-Forné and Nguyen, 2019). The need to align the tourism initiatives with the local strength and opportunities is also highlighted by SWOT-based community empowerment plans (Lili Rahayu Usfatun Khasanah & Nisrina Tuhfatul Azizah, 2022).

2.3 Tea tourism as a niche and an emerging tourism

Tea tourism is now accepted as a sub-maritime of rural and agro-tourism that draws upon the cultural, historical, and ecological concern of tea landscapes (Bohne, 2021; Bulut Solak & Amin, 2020). It merges farming experiences with tourism products, which allows visitors the chance to learn about tea farming, processing, and cultural values (Khaokhrueamuang et al., 2021).

Sunset destinations like Darjeeling and Nilgiris have proved that tea tourism can be used to enhance the development of a region and destination branding (Sanjiv Kumar Sharma et al., 2016; The Hindu Bureau, 2023). Moreover, tea tourism positively impacts visitor experiences by quality of the service, authenticity, and memorability, also having a positive impact on destination loyalty (Ng et al., 2022).

Nevertheless, infrastructure, the lack of trained guides, and marketing strategies are also some of the challenges that impede its potential (Mondal and Samaddar, 2021). It has suggested destination marketing strategies that touch upon tea heritage and socio-economic benefits to mitigate these problems (Fernando et al., 2017).

2.4 Tea production systems can be affected by the climate change

Climatic variability such as temperature, rainfall, and severe weather conditions is extremely sensitive to tea cultivation (Ahmed et al., 2018; Jayasinghe and Kumar, 2021). The factors which have been found to have an impact on climate change include yield, quality, and geographical suitability of tea (Gunathilaka et al., 2017; Beringer et al., 2020).

The rise of droughts, floods, heat stresses has a substantial effect on physiological processes in tea plants, reducing their productivity (Hasan et al., 2023; Venkatappa et al., 2021). The environmental stressors are also mentioned in studies as factors that influence the biochemical compounds that dictate the quality of tea (Ahmed et al., 2019; Han et al., 2020).

The results of regional research in Assam, Sri Lanka, and Kenya suggest that the abundance of climate variability is already affecting the patterns of tea production and livelihoods of farmers (Duncan et al., 2016; Rigden et al., 2020; Kariuki et al., 2022). To counter such effects, the strategies of crop diversification, better irrigation, and agroforestry have been proposed (Muench et al., 2021; Rokhmah et al., 2022).

2.5 Tourism as a means to climate adaptation and livelihood diversification

Considering the weakness of tea monoculture systems, diversification towards tourism is becoming a more feasible approach to deal with climate change. The combination of tourism and the agricultural system offers additional earnings and minimizes reliance on climate-sensitive crops (Yan et al., 2021).

CBET, especially, helps to boost the adaptive capacity via sustainable resource management and resilience of communities (Ma et al., 2022). Diversification in the form of tourism also empowers the local economies by generating employment opportunities and entrepreneurship (Gudkov et al., 2021).

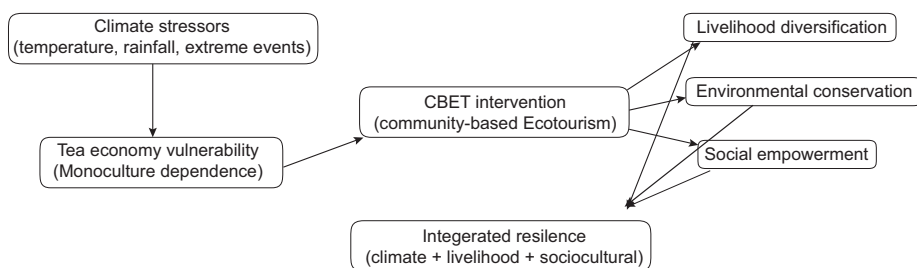
Moreover, the environmental education and awareness can be provided with the help of agro-tourism and tea tourism, which will help in minimizing climate changes (Raihan, 2023). Local assets provided as a part of tourism are guaranteed to remain sustainable and socially relevant (Yan et al., 2021).

2.6 Research gaps and emerging directions

Despite growing literature on CBT, tea tourism, and climate change, there remains a lack of integrated studies examining CBET as a climate adaptation strategy in tea-producing regions. Most studies focus either on agricultural adaptation or tourism development independently, with limited interdisciplinary approaches.

Additionally, comparative studies across major tea-producing regions such as Assam, Nuwara Eliya, and Kericho are scarce. There is also a need for empirical research assessing the socio-economic and environmental impacts of CBET initiatives in these regions.

The conceptual framework portrays Community-Based Ecotourism (CBET) as a mediating mechanism that connects climate-induced vulnerabilities and multi-dimensional resilience outcomes at tea-producing areas. Stressors such as changes in temperature, unpredictable rainfall, contribute to climate change, and these increase the vulnerability of livelihoods in monoculture dependent economies. In reaction to this CBET is an adaptive intervention that helps bring about three interconnected pathways: livelihood diversification, environmental conservation practices, and sociocultural empowerment. The combination of these pathways leads to overall resilience, involving economic stability, environmental sustainability, and empowered community agency. The framework acknowledges that the success of CBET is context-dependent with contextual moderators determining the effectiveness including institutional support, governance structures, infrastructure, and market access.



Source: Author compilation

Figure 1 Conceptual framework

The model unites the resilience theory with the sustainable livelihoods framework and the empowerment theory to conceptualize CBET as a dynamic socio-ecological system that facilitates dynamic reconfiguration of climate-sensitive plantation economies.

3 METHODOLOGY

The research takes a qualitative and comparative multiple case study approach where it explores the importance of Community-Based Ecotourism (CBET) as a climate change adaptation tool in tea production zones. It was believed that a multiple-case approach could be a suitable option since it allows one to deeply examine a complex socio-ecological process in various contexts and compare and analytically generalize cases. The researchers targeted three key tea-producing areas, namely Assam (India), Nuwara Eliy (Sri Lanka) and Kericho (Kenya) in the study that was purposely chosen depending on three factors which include high state of climatic vulnerability, the presence of tea based mono culture based economies, and the existence of either emerging or established CBETs activities. This cross-sectional design can be used to determine common trends and context-specific differences in the role that CBET plays in promoting resilience.

The study is based on an interpretivism paradigm, which acknowledges the existence of socially constructed views of climate change, adaptation and tourism. The theoretical approach of the study incorporates a resilience theory, the sustainable livelihoods framework, and the empowerment theory that together guide in the formulation of the research instruments, process of data collection, and analytical framework. In particular, the interview guides were designed in a way that they would replicate dimensions of ecological stress, livelihood diversification and participation in community activities, so that theoretical constructs and empirical investigation are in tune.

The secondary data collection was received by a mixture of semi-structured interviews, focus group discussions, and field observations. In-depth interviews were held in three study sites, which consisted of a wide variety of stakeholders such as tea farmers, plantation workers, CBET operators, local entrepreneurs, community leaders and non-governmental organizations representatives. To gather collective views and community-related dynamics and to obtain contextual information about tourism practices, environmental conditions, and local interactions, nine focus group discussions and field observations were planned. Participants were selected using a purposive and snowball sampling plan, which allowed recruiting individuals with firsthand

experience and familiarity with the production of tea and tourism activities. The strategy guaranteed the relevance and richness of the data and represented several perspectives in each case.

Data collection was carried out in steps to provide the possibility to perfect the research instruments and to get more involved into the field. All interviews and discussions were carried out in a local context, with the necessary translation assistance, and audio-recorded and transcribed word-to-word, to guarantee accuracy. It was highly monitored concerning ethical issues, such as informed consent, confidentiality, and voluntary participation.

The thematic analysis as the basis of the analytical approach allows recognizing and interpreting patterns identified in qualitative data systematically. The analysis was conducted in a multi-stage coding procedure to increase the transparency and rigor. The first stage entailed open coding in order to discover preliminary ideas deriving out of data, including perceptions of climate change, livelihood issues, tourism involvement, and environmental practices. Axial coding was then used to group these early codes into broader categories, relating related concepts, and finding relationships between them. Selective coding was then utilized in the final phase to come up with high-level themes, which align with the theoretical aspects of climate, livelihood, and sociocultural resilience.

In order to guarantee analytical rigor a coding scheme was formulated in an iterative manner whereby both inductive elements of the data and deductive factors based on theoretical framework were adopted. As an example, codes of climate stress, income diversification and the community involvement were mapped onto wider thematic constructs of ecological, livelihood and social cultural resilience. Constant comparison within and between cases drove the development of themes, making it possible to identify similarities/ differences and patterns. Participant quotes were used to illustrate examples to add empirical support and increase interpretative validity.

Table 1 Coding framework and thematic structure

Code category	Sub-codes	Description	Example indicator
Climate stress	Temperature change, rainfall variability, extreme events	Perceived and observed climate impacts on tea production	“Rainfall has become unpredictable...”
Livelihood vulnerability	Income instability, monoculture dependence	Economic risks due to tea dependence	“We rely only on tea income...”
CBET participation	Tourism involvement, homestays, guiding	Engagement in tourism-related activities	“We started homestay for tourists...”
Livelihood diversification	Alternative income, skill development	Expansion beyond agriculture	“Tourism gives extra income...”
Environmental practices	Conservation, waste management, biodiversity	Eco-friendly practices linked to tourism	“We protect forest areas now...”
Social empowerment	Participation, gender roles, decision-making	Community involvement and agency	“Women now lead tourism groups...”

Table 2 Theme development process

Stage	Process	Outcome
Open coding	Initial line-by-line coding of transcripts	Identification of raw concepts (e.g., climate stress, tourism income)
Axial coding	Linking related codes into categories	Formation of broader categories (e.g., vulnerability, adaptation)
Selective coding	Integration into core themes	Development of key themes: ecological, livelihood, sociocultural resilience

The systematic aspect was done through cross-case analysis where comparisons across the three study regions were taken. This came to be done through formulation of a comparative Analytical Matrix that assisted in the study of the way CBET works within various socio-economic and institutional settings. Using this, they managed to determine the following patterns which include; application of CBET as a buffering mechanism in Assam, a diversification strategy in Nuwara Eliya, and a new source of employment in Kericho. This comparative research method enhances the explanatory force of the research as it shifts away the descriptive stories to analytical generalization.

On issues of improving authenticity, a number of methods were used as per the qualitative research requirements. Data triangulation in the form of interviews, focus groups, and observations was used to ensure credibility as well as the long-term field interaction. Dependability was ensured through having a clear audit trail of the data collection and analysis procedures and the strength of confirmability came through basing interpretations on empirical data and reduction of researcher bias. The reflexivity was ensured during the research process through consideration of positionality of the researchers and its possible impact in the interpretation of data. Transferability was dealt with through the use of rich descriptions of contexts, which allowed readers to determine the applicability of findings to other contexts.

These efforts notwithstanding, there are some limitations which must be recognized. The study presented is qualitative in nature and therefore does not offer much breadth as this constrained its generalizability. Also, the differences in local context or institutional structures can affect the generalizability of the results. Nevertheless, the comparative design and methodological rigor of the research study has offered a strong ground on which one can derive significant information on the relevance of CBET in adapting to climatic changes.

4 FINDINGS

4.1 Climate stress and emerging vulnerabilities in tea-based livelihoods

In the three study areas, Assam, Nuwara Eliya, and Kericho, ramping up climate variability was a recurrent factor among participants that have influenced tea production and related livelihoods. Respondents pointed out the change in rainfall patterns, increase in temperatures and increase in the occurrence of extreme weather events as some of the most apparent upsets to agricultural cycles. In Assam, tea cultivators pointed to the unreliability of the monsoon patterns, saying that it is now very erratic, which directly impacts the quality of leaves and yields. Correspondingly, interviewees in Nuwara Eliya reported long dry seasons and subsequent heavy rains, which not

Table 3 Sample profile and data collection

Study region	Country	Villages covered	Interviews (n)	Focus groups (n)	Key participants
Assam	India	4	24	3	Tea farmers, plantation workers, CBET operators, NGOs
Nuwara Eliya	Sri Lanka	4	24	3	Smallholders, tourism entrepreneurs, community leaders
Kericho	Kenya	4	24	3	Plantation workers, youth groups, local guides
Total	—	12	72	9	Multi-stakeholder representation

Source: Author's own compilation

Table 4 Illustrative participant quotations

Theme	Quotation	Location
Climate stress	"Rainfall has become unpredictable, affecting our tea yield."	Assam
Livelihood diversification	"Tourism helps us when tea income is low."	Nuwara Eliya
Social empowerment	"Women are now actively managing homestays."	Kericho
Environmental awareness	"We now protect forests because tourists come to see nature."	Assam

only meant disturbance of the harvesting seasons, but also heightened the vulnerability to pests and erosion. Plantation workers and small farmers indicated that there were clearly felt higher temperatures and altered season patterns in Kericho which lowered productivity and caused changes in income levels.

This set of results shows that climate change is not entered into as simply a venture into the world of the environment, but as a multi-tiered vulnerability in economic security, job security, and societal welfare. These risks are intensified by the fact that much reliance on tea as the main source of revenue contributes to the structural weakness of monoculture economies. Noteworthy, respondents in all the regions were not very confident in the current adaptation measures to agriculture, which were not believed to be enough to deal with the magnitude and uncertainty of climatic changes. This underscores the necessity to involve alternative and supplementary strategies of adaptation beside the conventional agriculture interventions.

4.2 CBET as an agent of livelihood diversification

The results show that Community-Based Ecotourism (CBET) has become a major avenue to livelihood diversification although the level of development has fluctuated among the study zones. CBET Projects, mainly as homestays, plantation tours, and cultural experiences, have offered them with alternative income sources, especially

when the agricultural productivity is low. The respondents said that when there are doubts in the household costs where the tea income is concerned, tourism assists us to handle the economic shocks caused by climate, which suggests that Buffering happens through CBET.

In Nuwara Eliya, relatively well-developed tourism infrastructure has facilitated the structural integration of CBET in the local economies, backed by institutional support. In this case, diversification does not only pertain to additional income, but that of more strategic conversion to mixed livelihood systems. The respondents indicated a more developed stage of CBET development as they reported taking part in various tourism related products and services such as accommodation, handicraft, and agro-tourism experiences. On the contrary, CBET in Kericho is in its early phases, and there is a low but increasing involvement of youth and community groups. The employment opportunities generated by tourism are still taking shape, although they are currently not as widespread as to make a substantial change in livelihood structures.

Although it has good contributions, the results also indicate that access to CBET opportunities is unequal. The obstacles given include; scarcity of financial resources, inadequate skills and lack of proper infrastructures limiting participation especially in the marginalized groups. This indicates that at the same time CBET has the role of diversification, the local socio-economic conditions and systems of institutional support mediate the benefits.

4.3 Environmentally-conscious and conservation-based practices

One of the findings that have been realized in all study sites is the growing connection between environmental consciousness and tourism activities. According to participants of CBET initiatives, there was an increased focus on conservation activities such as waste management, protection of the natural landscapes, as well as biodiversity protection. In Assam, it was shown that people clean up and conserve forests lands because tourists care about nature and reported that tourism is working as a source of motivation to take care of the environment.

In Nuwara Eliya conservation is more institutionalized with community groups and local organizations having been active in promoting sustainable tourism practice. These involve limits on the consumption of resources, encouragement of environmentally friendly accommodation and educational campaigns among the residents and the visitors. Kericho, although environmental undertakings are at an early stage, there is a rising awareness of the benefits of conservation in terms of tourism attraction and maintenance of local ecosystem.

The results however show that there are new strains between conservation and commercialisation. The rise in the activity of tourists in some places has raised the problem of waste generation, overloading of resources and environmental degradation especially in places where the means of control are lax. This implies that the environmental impacts of CBET are not consistently good and largely rely on how governance structures and community organise and control tourism in order to sustainably manage tourism.

4.4 Community empowerment and sociocultural transformation

It concludes that the CBET has been a source of sociocultural change through increased community engagement, more strong social networks, and establishment

of new positions within local economies. The intrusion of participants in the decision making process concerning the development of tourism also indicated that there was a change in the nature of governance to a more participatory structure which was evidenced by the participants in all the three regions.

CBET projects have provided women and young people in Assam and Nuwara Eliya with opportunities to participate in income-generating ventures, including taking care of homestays, taking tourists about and making handcrafts. The respondents said that now women are participating actively in tourism activities and as a result, their financial independence has been enhanced. This shows the possibility of CBET to aid social empowerment and inclusion of women.

Nevertheless, the results also point out the constraints in the degree of empowerment realized. There are a number of situations where decision making is still being captured by a small group or a select few people, which means that the power of decision-making is still in the hands of a few. Also, not all members of the community receive the same benefits as a result of tourism, which results into income and participation imbalances. These dynamics indicate that although CBET can lead to the development of sociocultural resilience, its results are determined by the existing power structures and institutions.

4.5 Cross-case patterns and contextual differences

The comparison analysis identifies similar trends and major situation-specific disparities in the role of CBET in resiliency in the three regions. Another similarity is the acknowledgement of tourism as another livelihood source that has the potential to decrease the reliance on tea production. In all of them, CBET is related to greater income chances, high environmental consciousness and involvement in community.

Meanwhile, the character, as well as the scope of these contributions, is quite different. CBET is very much an alternate mechanism of adaptation in Assam, which offers minor, but significant, economic assistance at times of climatic adversity. In Nuwara Eliya, it is a more integrated and institutionalized policy, which plays an important role in livelihood diversification and community development. CBET in Kericho remains in its infancy development and the effects are mainly limited to the localized creation of employment opportunities.

These variations highlight the importance of contextual factors, including institutional support, market access, infrastructure, and community capacity, in shaping the effectiveness of CBET initiatives. The effectiveness of CBET initiatives is influenced by a number of factors, among them being the institutional support, market access, infrastructure, and community capacity. These results therefore highlight the fact that CBET cannot be a blanket intervention but a localized pathway to adaptation the outcomes of which depend on the local socio-economic and governance environments.

5 SYNTHESIS OF FINDINGS

Altogether, the results indicate that CBET can be multi-dimensional in boosting resilience in tea-producing areas. It not only helps diversify livelihoods but also enhances environmental awareness and brings about sociocultural change. Yet, these advantages are not homogenous and consensual. The efficiency of CBET as a climate adaptation

strategy is affected largely by structural constraints, governance issues and contextual differences.

Notably, the results go beyond the descriptive narratives by showing the interdependent relationships between the ecological, economic, and social processes within CBET initiatives. This combined view offers a more subtle explanation of the role in which tourism can play in supporting climate-vulnerable plantation economies.

6 DISCUSSIONS

The discussion explains the findings within the context of the three main objectives of the study, and links systematically empirical evidence with the generated coding format and topic system. By incorporating the topics of climate stress, livelihood diversification, and environmental practices, social empowerment, the analysis will show how Community-Based Ecotourism (CBET) functions as a multi-dimensional strategy of adapting to the tea-producing regions.

Aim: To identify the factors influencing CBET and climate resilience in tea-producing communities and their processes (Objective 1).

The first objective aimed to explore the contribution of CBET to the increased climate resilience, which is achieved by diversifying livelihoods. Their findings organized based on the codes of climate stress and livelihood vulnerability indicate that tea-reliant communities in Assam Nuwara Eliya, and Kericho are facing mounting climatic uncertainties, such as unfocused rainfall, rise in temperatures, and fluctuations in production. Such stressors strengthen the structural vulnerability of monoculture economies in which the income and the employment are closely connected to a single crop.

The introduction of CBET, claimed by the code CBET participation, is an important adaptive reaction to these vulnerabilities. The empirical evidence suggests that alternative income-generating activities like homestays, guiding services and cultural activities form part of tourism-based business thus eliminating the reliance on tea production. This is consistent with the theme of livelihood diversification, as it shows that CBET is a resilience approach, as it diversifies the economic foundation of the households.

Nonetheless, the discussion goes beyond validating the existing literature by stating that not all the literature provides a uniform access to and sufficient diversification through CBET. The fact that the structural constraints present such as limited capital, insufficient infrastructure and skill gaps are improved by CBET in a biased and uneven way poses the argument that it strengthens resilience. This observation means that the assumption in the sustainable livelihoods model that diversification necessarily results in the resilience is complicated. The findings, however, indicate that the enabling conditions, such as institutional support and access to markets, determine resilience.

Theoretically, the results prove and expand resilience theory by showing that CBET leads to adaptive reconfigurations of livelihood systems, as opposed to income supplementation. In this way, CBET appears as a context-specific response approach that would reduce the vulnerability to climate and, at the same time, would lead to new types of economic risks related to tourism dependency.

The second objective examined the larger socio-economic, environmental and empowerment impacts that are related to CBET. Basing the thematic analysis on the codes of livelihood diversification, environmental practices, and social empowerment,

it is possible to note that CBET is associated with a variety of, interconnected consequences beyond the economic advantage.

CBET is useful economically in terms of income generation and creation of employment, especially in areas where relatively developed tourism infrastructure exists (including Nuwara Eliya). Nevertheless, the result suggests that the economic gain is unevenly distributed and some groups (those who can access resources or networks) have a higher proportion of opportunities. This shows how there are unaddressed disparities in the structures and consequently questions the principles of equitable development that CBET is linked to.

On the environmental front, as shown by the results, CBET leads to the growth of the consciousness and embracing of conservation practices. The code environmental practices encapsulates environmental practices like waste disposal, protection of biodiversity and sustainable use of resources, which tend to be driven by maintaining attractiveness of destinations. These results are consistent with the literature on ecological resilience and this indicates that tourism may provide incentives on environmental stewardship. There are however, tensions as found in conservation and commercialization that are equally identified in situations where the development of tourism is not effectively regulated. This implies that ecological performance of CBET is not self-evident but instead relies on institutions and administration capacity of the community.

The discussion of social empowerment shows that CBET helps to achieve more participation, especially among women and youth and, in turn, leads to sociocultural resilience. Participation in tourism in a number of instances has increased decision-making power, financial autonomy and social appreciation. Nonetheless, the results also mention a continuing set of challenges, such as elite capture and unequal participation, limiting the transformational prospect of CBET. This indicates that there is no automatic process of empowerment in CBET but rather an institutional arrangement and local power relationship mediate it.

Taken together, these results reveal that CBET is a multi-dimensional system, which generates interlinked socio-economic, environmental and sociocultural impacts. Nonetheless, these results are not equal and depend on a context that needs to be understood in a more critical and subtle way than presented in the literature.

The third objective aimed at determining cross-case trends and contextual differences in using and the effectiveness of CBET. Comparative analysis, which is backed up with cross-case coding and thematic synthesis indicates convergences and divergences among the three study areas.

The general trend between Assam, Nuwara Eliya and Kericho strategies is that CBET is a feasible approach to curb the over-reliance of livelihoods on tea. In every scenario, the codes of CBET participation and livelihood diversification point to the shift into mixed systems of the economy, with tourism being a supplement to agriculture. Also, the advent of environmental activities and social empowerment in all areas presupposes that CBET has a part to play in environmental resilience processes beyond economic adaptation.

Nevertheless, there are pronounced contextual differences that can be observed in the size, design, and results of CBET programs. CBET serves more of a buffering role in Assam, complementing income in times of climatic stress but is not yet scaled up. CBET is better institutionalized and integrated in Nuwara Eliya where there is greater infrastructure and governance structure which reflects in greater transformation in livelihood. Conversely, Kericho is a nascent situation, whereby CBET is at

its formative years, with little, yet increasingly, influence on the employment and the community.

These differences highlight the influence of situational elements like institutional backdrop, market availability, community capability, and governance structure in determining the results of CBET. These results thus cast doubt on the idea of CBET as a uniformly applicable model and instead cast it as a context-mediated adjustive system.

Theoretically, this comparative observation can further improve the enhancement of the components of resilience, livelihoods, and empowerment models by illustrating the interplay of these aspects within socio-economic settings in diverse ways. It also fills one missing gap in the literature by presenting cross-national empirical data of plantation economies and which have received little attention in tourism and climate adaptation studies.

7 INTEGRATED THEMATIC SYNTHESIS

By unifying these three goals, the discussion underscores that these themes of climate stress, livelihood diversification, environmental practices and social empowerment are not independent but they are closely intertwined. CBET acts as a mediating process that connects climate vulnerability with adaptive actions at an economic, ecological and social level.

Nonetheless, the results also underline that the process of this integration is not automatic, as well as homogenous. The type of contribution made by CBET to resilience is modulated by structural inequalities, governance issues, as well as market forces. CBET therefore must be perceived as an intermediate of adaptation, which actively adapts in a circumstantial way, as opposed to a value-neutral solution.

8 CONCLUSION

This paper aimed to evaluate Community-Based Ecotourism (CBET) as a climate adaptation plan in tea-producing areas by establishing a comparative study on Assam

Table 5 Cross-case comparative analysis

Dimension	Assam (India)	Nuwara Eliya (Sri Lanka)	Kericho (Kenya)
Role of CBET	Buffer income during climate stress	Structured diversification strategy	Emerging employment opportunity
Institutional support	Moderate	Strong	Limited
Community participation	Growing	High	Emerging
Environmental impact	Moderate conservation	Strong conservation practices	Developing awareness
Key challenge	Limited infrastructure	Market dependency	Lack of capacity

(India), Nuwara Eliya (Sri Lanka) and Kericho (Kenya). The results indicate that CBET represents a multi-dimensional change process, which plays a role in the diversification of livelihoods, stewardship of the environment, and sociocultural change simultaneously. CBET will offer a valuable tool to improve resilience, in situations where there is progressive uncertainty in the climate because of reductions in the support of climate sensitive monoculture systems. But, the research also demonstrates that this benefit is not uniform nor is it guaranteed, and it is influenced by local socio-economic realities, institutional and governance structures.

One of the contributions towards this research is the theoretical integration made. The study contributes to a hybrid conceptualization of CBET as a socio-ecological system to connect climate resilience with livelihood and sociocultural resilience by intermingling the resilience theory, sustainable livelihoods framework, and the empowerment theory. The integrative approach is a compelling solution to an important gap in the existing literature because these dimensions have frequently been analysed separately. The results indicate that CBET is not only a diversification plan used by economies as an economic instrument, but a dynamic process of creative reconfiguring in climate-prone communities. By so doing, the study is enabled to build upon the current tourism resilience literature, which has concentrated solely on and through the lenses of the protected areas and rural tourism settings to the context of plantation-based monoculture economies, which have been underrepresented in the literature.

The study has important contributions, empirically, as it has a comparative multiple-case design that allows both the identification of common patterns and the identification of variations depending on the context. As analyzed, although CBET is known to be an applicable strategy of adaptation in all regions, the role of the strategy varies significantly: serving as a buffer system in Assam, a diversification route in Nuwara Eliya, and an emerging job source in Kericho. These differences highlight the significance of situational components like institutional backing, market reach, infrastructure, and communal capacity in determining adaptation consequences. The research proposed in-depth qualitative data that can be generated due to profound field research contributes to the underdeveloped gap of the research on tourism-based adaptation in tea producing areas and provides a more detailed insight into the realities of how CBET is carried out.

The findings at the policy level show that combined and setting-specific strategies to climate adaptation are necessary. CBET has great potential; however, its implementation will be effective with the presence of conditions such as availability of finance, development of skills, infrastructure and inclusive governance systems. The policy-makers/development practitioners should now transcend the one size fits all models and develop interventions that can tackle the local limitations and also increase community capacity. The paper further highlights the significance of regulatory measures so that the process of developing tourism does not affect the environmental sustainability, especially in the ecologically sensitive plantation environments. Irrespective of its contributions, the study has some limitations. Qualitative characteristic of the study focuses more on depth than on generalizability, and the results are context-related to the case areas chosen. Moreover, though the comparative method can increase the analytical acumen, differences in local circumstances can decrease comparability between cases. The constraints, however, also present research possibilities in the future.

Future researchers might extend the insights of this research to use mixed-method approaches that can measure the economic and environmental effects of CBET to balance the qualitative results with quantitative indices. Longitudinal research would be especially helpful in determining how sustainable CBET initiatives would be in the

long run, particularly when there is a changing climate and market. Also, the use of digital technologies, market connections and policy interventions in scaling CBET as an adaptation strategy should be investigated. Further comparative research involving other plantation systems like coffee, cocoa or rubber might provide further insight on tourism-based adaptation in monoculture economies. Lastly, more focus needs to be given to the aspects of equity and inclusion when it comes to how disadvantaged groups may take a more active part in and benefit by CBET programs.

This paper has shown that CBET has significant potential as a context-specific, integrative strategy to climate adaptation, able to tackle interdependent ecological, economical, and sociocultural imbalances. But its success depends on positive institutional conditions and open-minded government systems. The study not only fills gaps in theoretical and empirical research on the subject of tourism, climate change, and sustainable development, but also provides practical information to create resilient and adaptive societies in plantation areas susceptible to climatic changes.

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